Adopted Levels, Gammas

Q(β^-)=−2760.47 *25*; S(n)=4143.08; S(p)=13781.6 *23*; Q(α)=−6358.69 2021Wa16
S(n),Q(α): uncertainty smaller than 0.5 eV.

^{17}O was first identified by (Blackett: Proc. Roy. Soc. A 107 (1925) 349); see (2012Th01).

Past evaluations: 1959Aj76, 1971Aj02, 1977Aj02, 1982Aj01, 1986Aj04 1993Ti07. In the present evaluation, we relied heavily on keywords and descriptions provided in the Nuclear Science Reference database (2011Pr03). The evaluation was updated in March 2022 to correct a systematic error in the calculation of E_x from E_{res} in ^{13}C(α,X), ^{14}C(^{3}He,X), ^{15}N(d,X) and ^{16}O(n,X) datasets.

We acknowledge fruitful discussions with D.J. Millener.

The atomic mass of ^{17}O is 16.9991317566 u *9* (2010Mo29). See recent AME Mass evaluations in (2012Wa16, 2017Wa10).

Theory:
See Shell model analyses in: 1963Pa03, 1966Ar10, 1966Br04, 1968Bi07, 1969Bo37, 1969Ul03, 1971Mu23, 1973Re17, 1979Co10, 1992Ja13, 1993Po11, 1997Pr05, 2005Vo01, 2006Ma17, 2006Vo14, 2012Yu07, 2016Pa05, 2018Ji07, 2018Ti08, 2019Sm04, 2019Ti04, 2020Fo04, 2020Ma25, 2020Mi15, 2020So01.
See Cluster model analyses in: 1995Ho13, 2003Ma70, 2003Mb05, 2004Mc02, 2005Wl02, 2006Go22, 2008ToZV, 2020Ca21.
See other theoretical analyses in: 1962Ma23, 1963Fa03, 1963Un01, 1965Ma16, 1966De18, 1966Ma12, 1967Go04, 1969De16, 1970Ry02, 1971Au08, 1971Hs02, 1971Ka40, 1972Be22, 1972En03, 1974HsZX, 1974Ri09, 1974Sa05, 1976Ma05, 1977Ho04, 1977Po16, 1978Fo22, 1978Kr02, 1979Kr05, 1980Hy03, 1980Va05, 1981Au04, 1986Be36, 1986Ed03, 1986To13, 1991Sk02, 1992Ba50, 1994Ma34, 1994Wa02, 1996Ti02, 1997Re07, 2000Bh07, 2005Ni24, 2006Id01, 2007Ch73, 2007Gu03, 2014Ho08, 2016De38, 2016Ho14, 2017Ti04.

See discussion on ^{17}O-^{17}F mirror nuclei and analog states in: 1970Wa01, 1981Sh17, 1981Ta09, 1983Ma38, 1984Sh30, 1985Sh24, 1994Sa45, 1994Sh20, 1995Fo18, 1996Bu20, 1998Ao02, 1999Ts06, 1999Ki28, 2001Ag09, 2001Au01, 2001Sh17, 2002Zh28, 2003Ti13, 2003Zh29, 2004Fu04, 2005Ti07, 2008Li53, 2010Ha11, 2011Ti09, 2012Mu14, 2012Ok02, 2017De08, 2017Sv01, 2018Do02, 2018Fo04, 2019Mu05, 2020De03.

See discussion on the nuclear and charge radii in:
experimental: 2000Fa12, 2001Oz03, 2001Oz04, 2012Ra29.
Using elastic electron scattering the ratio of the rms charge radii of ^{17}O to ^{16}O was determined to be 0.995 *6* as reported in (1970Si02) and 1.0015 *25* as reported in (1978Ki01). In (1979Mi09), it is reported that the charge radius of ^{16}O is larger than that of ^{17}O by 0.008 fm *7*.
theory: 1969No03 (R^{charge}_{RMS}=2.70 fm (theory)), 1973Ho32, 1979Br17 2013Fo09, 2017Ah08(R^{matter}_{RMS}=2.73 fm *4*), 2018Fo12, 2019Fo08, 2019Ra09, 2019Sa02, 2020An13.

Moments and hyperfine structure:
Experimental results on μ:
1951Al08: The ratio of the resonance frequency of ^{17}O from H_2O to the resonance frequency of D^2 from D_2O was determined to be $\nu(^{17}O)/\nu(D^2)$=0.88313 *4*; the spin of ^{17}O is I=5/2; μ=−1.89280 nm *19*.
2005An15: ^{17}O measured NMR spectra; deduced μ=−1.8935428 *95*.
Theory, calculated μ dipole moment:
1968Pe16, 1968Sc18, 1972Gl06, 1973Er03, 1974Ha27, 1977Ko28, 1980Br13, 1980Ch35, 1983Zi01, 1984Bo11, 1984Zi04, 1985Bl20, 1985Zi05, 1987It01, 1988Ho16, 1989Ch24, 1989Ne02, 1990Mo36, 1991Bl14, 1994Li55, 1999Ga57, 2003Sm02, 2005An15, 2006Ya12, 2009Li64, 2012Fu06, 2012We11, 2014Ac01, 2017Sa48.

Experimental results on Q:
1957Ka68: measured Q=−0.0265 b *30*.
1957St93: measured Q=−0.026 b *9*.
1969Sc34: measured Q=−0.025 b *78*. See also (1969Sc33).

Adopted Levels, Gammas (continued)

92Su: Sundholm and Olsen, J. Phys. Chem. 96 (1992) 627: measured Q=−0.02558 b *22*.
2008Py02, 2013De06: ^{17}O compiled evaluated ground-state quadrupole moments: (2008Py02) considers Q=−25.58 mb *22* as the most accurate value (Su92: J. Phys. Chem. 96 (1992) 627).
Theory, calculated Q quadrupole moment: 1969Ke07, 1969Go12, 1969Ma38, 1986Ca27, 1991Zh06, 1993Ki05, 1993Ki22, 1997Si10, 1997Si34, 2003Ra04, 2003Sm02, 2003Ra09, 2007Be09, 2017Sa48.

See moment compilations in: 1969Fu11, 1989Ra17, 2008Py02, 2005St25, 2015St03, 2016St14, 2019StZV, 2020StZV.

Other experimental results not listed elsewhere:
1981Ma16: measured spin-dependent neutron scattering length.

^{17}O Levels

Cross Reference (XREF) Flags

A	^{17}N β^- decay	V	^{14}C(^{3}He,X): res	AP	^{16}O(^{13}C,^{12}C)
B	^{17}F β^+ decay	W	^{14}C(α,n)	AQ	^{16}O(^{14}N,^{13}N)
C	^{18}N β^-n decay	X	^{14}C(^{6}Li,t)	AR	^{16}O(^{18}O,^{17}O)
D	^{2}H(^{16}O,p)	Y	^{14}N(t,γ)	AS	^{17}O(γ,γ')
E	^{6}Li(^{13}C,d)	Z	^{14}N(α,p),^{4}He(^{14}N,γ^{17}O)	AT	^{17}O(γ,n),^{17}O(γ,p)
F	^{6}Li(^{18}O,^{17}O)	Others:		AU	^{17}O(e,e′)
G	^{7}Li(^{18}O,^{17}O)	AA	^{14}N(^{6}Li,^{3}He)	AV	^{17}O(π^+,$\pi^{+\prime}$),(π^-,$\pi^{-\prime}$)
H	^{9}Be(^{13}C,α^{13}C)	AB	^{15}N(d,p),(d,d),(d,γ)	AW	^{17}O(p,p′)
I	^{9}Be(^{16}O,^{17}O),^{16}O(^{9}Be,^{17}O)	AC	^{15}N(d,α)	AX	^{17}O(^{3}He,^{3}He)
J	^{12}C(^{6}Li,p)	AD	^{15}N(^{3}He,p)	AY	^{17}O(^{16}O,^{16}O),(^{16}O,^{16}O′)
K	^{12}C(^{7}Li,d)	AE	^{15}N(α,d)	AZ	^{18}O(γ,n)
L	^{12}C(^{9}Be,α),(^{11}B,^{6}Li)	AF	^{15}N(^{11}B,^{9}Be)	BA	^{18}O(p,d)
M	^{13}C(α,γ)	AG	^{16}O(n,γ),(n,n)	BB	^{18}O(d,t)
N	^{13}C(α,n)	AH	^{16}O(n,γ):E=thermal	BC	^{18}O(^{3}He,α)
O	^{13}C(α,n),(α,α)	AI	^{16}O(n,γ):E(n)=10-80 keV	BD	^{19}F(n,t),(d,α),(α,^{6}Li)
P	^{13}C(^{6}Li,d)	AJ	^{16}O(n,n),(n,n′)	BE	^{19}F(p,^{3}He)
Q	^{13}C(^{7}Li,t)	AK	^{16}O(n,α)	BF	^{20}Ne(n,α)
R	^{13}C(^{9}Be,αn),(^{9}Be,^{5}He)	AL	^{16}O(p,π^+)	BG	^{181}Ta(^{18}O,^{17}O)
S	^{13}C(^{11}B,^{7}Li)	AM	^{16}O(d,p),(d,pγ)	BH	^{208}Pb(^{17}O,^{17}O′):CoulEx
T	^{13}C(^{13}C,^{9}Be)	AN	^{16}O(α,^{3}He),(α,n^{3}He)		
U	^{13}C(^{17}O,^{17}O)	AO	^{16}O(^{7}Li,^{6}Li)		

E(level)[†]	J^π	$T_{1/2}$ or Γ	XREF	Comments
0	5/2$^+$	stable	ABCDEFG IJKL PQRS UVWXYZ	XREF: Others: AA, AD, AE, AF, AG, AH, AI, AL, AM, AN, AO, AP, AQ, AR, AW, AX, AY, AZ, BA, BB, BD, BE, BG, BH T=1/2 μ=−1.893543 *10* (2005An15) Q=−0.02558 *22* Q: From (Sundholm and Olsen, J. Phys. Chem. 96 (1992) 627). See (2008Py02, 2013De06).
870.756 *20*	1/2$^+$	179.6 ps *27*	AB DEFG IJKLM PQRS VWXYZ	XREF: Others: AA, AD, AE, AF, AG, AH, AI, AL, AM, AN, AO, AP, AQ, AR, AU, AV, AW, AX, AY, AZ, BA, BB, BD, BE, BF, BG, BH %IT=100 E(level): From recoil corrected E_γ. $T_{1/2}$: weighted average of 170 ps *7* from ^{14}N(α,p)

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{17}O Levels (continued)

E(level)†	J^π	$T_{1/2}$ or Γ	XREF	Comments
				(1974Sc09) and 180.4 ps *20* from ^{16}O(d,p) (see discussion). J^π: From ^{16}O(d,p).
3055.40 *6*	$1/2^-$	110 fs *+24−21*	A EFG JKL PQRS WX Z	XREF: Others: AA, AD, AF, AH, AI, AL, AM, AN, AO, AR, AU, AV, AW, AZ, BA, BB, BD, BE, BF, BG %IT=100 E(level): From recoil corrected least squares fit E_γ=2184.49 *5* and 870.732 *20*. See also 3054.98 *20* from ^{16}O(d,p) (2015Pi05). $T_{1/2}$ or Γ: From 80 fs *+60−40* from ^{14}C(α,n) (1964Al11) and 110 fs *+28−21* from ^{181}Ta(^{18}O,^{17}Oγ) (2020Zi03). J^π: From ^{17}N β- decay.
3842.8 *4*	$5/2^-$	92×10^{-3} eV *6*	A EFG IJKL PQRSTU WX Z	XREF: Others: AA, AD, AE, AF, AL, AM, AN, AO, AS, AU, AV, AZ, BA, BB, BD, BE, BF, BG %IT=100 E(level): From 3842.76 keV *42* from ^{16}O(d,p) (1990Pi05), 3842.9 keV *4* from ^{19}F(d,α) (2015Fa12), 3844 keV *7* from ^{12}C(^{6}Li,p) (1986Sm10). $T_{1/2}$ or Γ: From ^{17}O(γ,γ′) (1994Mo18). J^π: From ^{14}C(^{6}Li,t) (1981Cu11).
(4143.27 *13*)	$1/2^+$			XREF: Others: AH E(level): From ^{16}O(n,γ):E=thermal capture state (2016Fi04).
4551.7 *7*	$3/2^-$	38.7 keV *28*	A EFG JKL PQ S X Z	XREF: Others: AA, AD, AE, AG, AJ, AL, AM, AO, AT, AU, AV, BA, BB, BD, BF %n=99.9905; %IT=9.5×10^{-3} $\Gamma_{\gamma0}$=1.80 eV *35* (1992Ig01); $\Gamma_{\gamma1}$=1.85 eV *35* Γ_γ: From (1992Ig01). See also Γ_γ<4.0 eV (1971Al09) and $\Gamma_{\gamma0}$=0.42 eV (1978Ho16). E(level): From 4551.4 keV *7* from ^{19}F(d,α) (2015Fa12), 4553.8 keV *16* from ^{16}O(d,p) (1990Pi05), 4550 keV *4* from ^{16}O(n,n) (1958Hu18), 4555 keV *8* from ^{12}C(^{6}Li,p) (1986Sm10) and 4544 keV *10* from ^{16}O(n,n) (1971Al09). Γ: weighted average of 39 keV *3* from ^{16}O(n,n) (see discussion), 40 keV *5* from ^{16}O(d,p) (1957Br82), and 38.1 keV *28* from ^{19}F(d,α) (2015Fa12). J^π: From ^{16}O(n,n) (1973Jo01).
5086.8 *9*	$3/2^+$	90 keV *3*	A DEF IJKL PQ Z	XREF: Others: AA, AD, AJ, AL, AM, AN, AQ, AT, AU, BA, BB %n=99.9988; %IT=1.1×10^{-3} $\Gamma_{\gamma0}$=1.0 eV (1978Ho16) E(level): From 5089 keV *1* from ^{2}H(^{16}O,p) (2013Al14), 5082 keV *8* from ^{16}O(n,n) (1958Hu18), 5084.4 keV *9* from ^{16}O(d,p) (1990Pi05) and 5087.7 keV *10* from ^{19}F(d,α) (2015Fa12). Γ: weighted average of 90 keV *5* (lab) from ^{16}O(n,n) (see discussion), 95 keV *5* from ^{16}O(d,p)

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{17}O Levels (continued)

E(level)[†]	J^{π}	$T_{1/2}$ or Γ	XREF	Comments
				(1957Br82), and 88 keV *3* from ^{19}F(d,α) (2015Fa12). J^{π}: From ^{16}O(n,n) (1973Jo01).
5216.18 *40*	9/2^{-}	<0.1 keV	E JKL PQ T X Z	XREF: Others: AA, AD, AE, AF, AG, AL, AM, AN, AR, AU, AV, BA, BD, BF %n≈100; %IT>0 E(level): From average of 5217 keV *8* from ^{12}C(^{6}Li,p) (1986Sm10), 5216.5 keV *4* from ^{19}F(d,α) (2015Fa12) and 5215.77 keV *45* from ^{16}O(d,p) (1990Pi05). Γ: This level is not observed in ^{16}O(n,n) (1973Fo11) leading to a width estimate of Γ<0.1 keV. J^{π}: From ^{17}O(e,e′) (1987Ma52).
5387.0 *22*	3/2^{-}	37.1 keV *24*	A EFG JKL Z	XREF: Others: AA, AD, AF, AJ, AM, AO, AT, AU, AV, BA, BB, BD, BF %n=99.9981; %IT=1.9×10^{-3} $\Gamma_{\gamma 0}$=0.7 eV *4* (1979Jo05) XREF: AT(5430)BF(5.55E3). E(level): From discrepant values of 5380 keV *9* from ^{12}C(^{6}Li,p) (1986Sm10), 5377.2 keV *35* from ^{16}O(n,n) (see discussion), 5379.2 keV *14* from ^{16}O(d,p) (1990Pi05) and 5388.8 keV *6* from ^{19}F(d,α) (2015Fa12). Γ: weighted average of 31 keV *4* from ^{16}O(n,n) (see discussion), 28 keV *7* from ^{16}O(d,p) (1957Br82), and 39.0 keV *21* from ^{19}F(d,α)) (2015Fa12). J^{π}: From ^{16}O(n,n) (1973Jo01).
5697.31 *33*	7/2^{-}	3.4 keV *3*	DE IJK PQ X Z	XREF: Others: AA, AD, AE, AF, AG, AJ, AM, AN, AT, AU, AV, BD, BF %n=99.968; %IT=3.2×10^{-2} $\Gamma_{\gamma 0}$=1.1 eV *4* (1979Jo05) XREF: J(5719)K(5700)AT(5710). E(level): From 5696 keV *2* from ^{16}O(n,n) (1973Fo11) 5697.5 keV *5* from ^{19}F(d,α) (2015Fa12) and 5697.26 keV *33* from ^{16}O(d,p) (1990Pi05). Γ: From ^{16}O(n,n) (1973Fo11). J^{π}: From ^{16}O(d,p) (1956Gr37,1961Ke02,1963Ya03,1964Sc12).
5732.04 *40*	(5/2^{-})	<1 keV	A E JK PQ T Z	XREF: Others: AA, AG, AJ, AL, AM, AT, AU, AV, BD %n≤100 XREF: J(5719)K(5700)T(5.8E3)AT(5729). E(level): From 5732.79 keV *52* from ^{16}O(d,p) (1990Pi05), 5731.6 keV *4* from ^{19}F(d,α) (2015Fa12) and 5732 keV *2* from ^{16}O(n,n) (1973Fo11). Γ: From ^{16}O(n,n) (1973Fo11). J^{π}: From ^{17}O(e,e′) (1987Ma52).
5869.62[#] *40*	3/2^{+}[#]	6.6 keV *7*	A E JKL PQ T Z	XREF: Others: AA, AD, AG, AJ, AM, AN, AU, BD, BF %n≤100 XREF: K(5900)T(5.8E3).

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{17}O Levels (continued)

E(level)†	J^{π}	$T_{1/2}$ or Γ	XREF	Comments
				E(level): From 5869.7 keV *6* ^{19}F(d,α) (2015Fa13), 5869.07 keV *55* from ^{16}O(d,p) (1990Pi05). Γ: From ^{16}O(n,n) (1973Fo11). J^{π}: From ^{16}O(n,n) (1973Jo01).
5931.5 *18*	1/2$^-$	32 keV *3*	A E JK PQ Z	XREF: Others: AA, AD, AG, AJ, AM, AU, BB, BD %n≤100 XREF: J(5877)K(5900). E(level): From 5931.0 keV *11* from ^{19}F(d,α) (2015Fa12) and 5938 keV *4* from ^{16}O(n,n) (1973Fo11). Γ: weighted average of 32 keV *3* from ^{16}O(n,n) (1973Fo11), 23 keV *10* from ^{16}O(d,p) (1957Br82), and 33 keV *5* from ^{19}F(d,α) (2015Fa12). J^{π}: From ^{16}O(n,n) (1973Jo01).
6362.3 *29*	1/2$^+$	126 keV *14*	A E KL PQ S U X Z	XREF: Others: AA, AD, AG, AJ, AL, AM, AT, AU, BD %n≈100 T=1/2 XREF: AM(6260)AT(6300). Γ_n: $\Gamma \approx \Gamma_n$ (2012La29). E(level): From 6355 keV *8* from ^{16}O(n,n) (1973Fo11) and 6363.4 keV *31* from ^{19}F(d,α) (2015Fa12). Γ: weighted average of 83 keV *+9–12* from ^{13}C(^{6}Li,d) (2012La29), 124 keV *12* from ^{16}O(n,n) (1973F011) and 136 keV *5* from ^{19}F(d,α) (2015Fa12). J^{π}: From ^{16}O(n,n) (1973Jo01).
6860.6# *4*	5/2$^+$#	<1 keV	JKL N PQ ZA	XREF: Others: AD, AG, AJ, AM, AU, AV, BB, BD %n≈100; %α>1×10^{-5} $\Gamma\alpha$=0.11×10^{-3} eV (2020Me09) XREF: AV(6.86E3). E(level): Average of 6860.7 keV *4* from ^{19}F(d,α) (2015Fa12) and 6860.3 keV *7* from ^{13}C(α,n) (1993Br17). Γ: From ^{16}O(n,n) (1973Fo11). J^{π}: from ^{12}C(^{6}Li,p),(^{7}Li,d) (2008Cr03).
6972.5 *4*	(7/2$^-$)	<1 keV	JKL N PQ Z	XREF: Others: AA, AD, AG, AJ, AL, AN, AT, AU, BD %n≈100; %α>8×10^{-6} $\Gamma\alpha$=0.082×10^{-3} eV (2020Me09) E(level): From average of 6972.6 keV *4* from ^{19}F(d,α (2015Fa12) and 6972.1 keV *8* from ^{13}C(α,n) (1993Br17). Γ: From ^{16}O(n,n) (1973Fo11). J^{π}: From ^{17}O(e,e′) (1972Ma52).
7164.24 *17*	5/2$^-$	1.38 keV *5*	JKL N PQ X Z	XREF: Others: AD, AG, AJ, AU, BD %n≈100; %α=0.19 $\Gamma\alpha$=2.7 eV $\Gamma\alpha$: From (1973J011). See also Γ_a=3.4 eV (2020Me09) and Γ_n/Γ_α=1300 (1957Wa46). E(level): From ^{16}O(n,n) (1980Ci03). See also 7166.4 keV *15* from ^{13}C(α,n)) (1973Ba10) and 7165.4 keV

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{17}O Levels (continued)

E(level)†	J^π	$T_{1/2}$ or Γ	XREF	Comments
				18 from ^{19}F(d,α) (2015Fa12). Γ: From ^{16}O(n,n) (1980Ci03). See also 1.5 keV *2* from ^{13}C(α,n) (1973Ba10). J^π: From ^{16}O(n,n) (1973Jo01).
7214 *5*	3/2$^+$	263 keV *7*	N PQ T	XREF: Others: AG, AJ, AT, AU, BD %n=99.957; %α=0.043 XREF: N(7202)P(7248). Γ_α/Γ=0.00043 from Γ_n=280 keV Γ_α=0.12 keV (1973Jo01). See also Γ_n=400 keV and Γ_α=0.09 keV (2008Pe09) and Γ_n=340 keV and Γ_α=0.14 keV (2008He11, 2012La29). and Γ_α=0.073 keV (2020Me09). E(level): From average of 7216 keV *4* from ^{19}F(d,α) (2015Fa12) and 7.20E3 keV *1* from ^{16}O(n,n) (1973Fo11). Γ: weighted average of 280 keV *28* from ^{16}O(n,n) (1973Fo11) and 262 keV *7* from ^{19}F(n,t) (2015Fa12). J^π: From ^{16}O(n,n) (1973Fo11, 1973Jo01).
7377.52 *19*	5/2$^+$	0.61 keV *+14−11*	JKL N PQ X Z	XREF: Others: AE, AG, AJ, AL, AN, AT, AU, BB, BD %n≈98; %α≈1.9; %IT=0.13 $\Gamma_{\gamma0}$=0.8 eV *4* (1979Jo05) XREF: J(7388)K(7380)L(7400)Q(7379)Z(7373)BB(7380)BD(7380.1). Γ_α/Γ≈0.02 from Γ_n=0.50 keV Γ_α=0.01 keV (1973Jo01) See also Γ_n/Γ_α=450 (1957Wa46), Γ_n=0.41 keV Γ_α=0.011 keV (2008He11, 2012La29). E(level): Average of 7377.47 keV *19* from ^{16}O(n,n) (1980Ci03) and 7380.8 keV *15* from ^{13}C(α,n) (1973Ba10). See also 7377 keV *3* from ^{16}O(n,γ),(n,n) (1973Fo11). Γ: weighted average of 0.6 keV *+2−1* from ^{13}C(α,n) (1973Ba10) and 0.64 keV *23* from ^{16}O(n,n) (1980Ci03). J^π: From ^{16}O(n,n) (1970Fo03,1957Wa46). and ^{13}C(α,n) (1973Ba10).
7380.64 *14*	5/2$^-$	0.90 keV *+17−14*	JKL N PQ Z	XREF: Others: AD, AG, AJ, AU, BB, BD %n=99.73; %α=0.27 XREF: J(7388)K(7380)L(7400)P(7381)Q(7382)Z(7373)BB(7380)BD(7380.1). Γ_α/Γ≈0.0027 from Γ_n=1.2 keV Γ_α=3.2 eV (1973Jo01). E(level): From 7380.62 keV *14* ^{16}O(n,n) (1980Ci03) and 7383.8 keV *15* from ^{13}C(α,n) (1973Ba10). See also 7380 keV *3* from ^{16}O(n,γ),(n,n) (1973Fo11). Γ: weighted average of 0.8 keV *+3−2* from ^{13}C(α,n) (1973Ba10) and 0.96 keV *20* from ^{16}O(n,n) (1980Ci03). J^π: From ^{16}O(n,n) (1970Fo03,1957Wa46). and ^{13}C(α,n) (1973Ba10).
7542 *20*	3/2$^-$	500 keV *50*	A D I L P Z	XREF: Others: AF, AG, AJ, AM, AQ, AU, BD

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{17}O Levels (continued)

E(level)†	Jπ	$T_{1/2}$ or Γ	XREF	Comments
				%n=99.984; %α=0.016 Γα=80 eV (1973Jo01); Γ_n≈500 keV XREF: I(7600)P(7559)Z(7560). E(level): Average of 7510 keV *30* from ^{19}F(d,α) (Bu51), 7530 keV *50* from ^{16}O(d,p) (Bu51) 7558 keV *20* from ^{16}O(n,n) (1973Fo11). Γ: From ^{16}O(n,n) (1973Fo11). Jπ: From ^{16}O(n,n) (1973Fo11).
7573.5# *6*	7/2+#	<0.1 keV	JK N PQ T	XREF: Others: AD, AG, AN, AU, AV, BD %n<99.93; %α>0.073 Γα≈7.3 eV (2020Me09) XREF: P(7576)T(7600)AV(7.58E3). E(level): Average of 7572.9 keV *21* from ^{13}C(α,n) (1973Ba10, 1993Br17) and 7573.5 keV *6* from ^{15}F(d,α) (2015Fa12). Γ: This level is not observed in ^{16}O(n,n) (1973Fo11) leading to a width estimate of Γ<0.1 keV. Jπ: From ^{12}C(^{6}Li,p)(^{7}Li,d) (2008Cr03).
7687.32 *22*	7/2−	14.4 keV *3*	J N PQ	XREF: Others: AD, AG, AJ, AN, AT, AU, BD %n=90.27; %α=9.72; %IT=0.01 Γ_n=13.0 keV *6* (1980Ci03); $\Gamma_{\gamma 0}$=1.5 eV *5* (1979Jo05) XREF: AJ(7687.32)AT(7660). E(level): From ^{16}O(n,n) (1980Ci03). See also 7689.2 keV *6* from from ^{19}F(d,α) (2015Fa12). Γ: From ^{16}O(n,n)(1980Ci03). See also 12 keV *4* from ^{19}F(d,α) (2015Fa12). Jπ: From ^{16}O(n,n) (1973Jo01).
7763.6‡ *4*	11/2−	<4 keV	JK PQ X	XREF: Others: AD, AE, AF, AL, AN, AT, AU, AV, BD, BF T=1/2 XREF: AT(7800). E(level),Γ: From ^{19}F(d,α) (2015Fa12). Jπ: From ^{12}C(^{7}Li,d) (2008Cr03).
7954 *8*	1/2+	85 keV *9*	N	XREF: Others: AG, AJ, AT, AU %n=92.61; %α=7.39 XREF: AT(7910). Γ_α/Γ=7.39 From Γ_α=6.7 keV and Γ_n=84 keV (1973Jo01). See also Γ_n/Γ_α=10 (1957Wa46). E(level): Average of 7951 keV *8* from ^{13}C(α,n) (1973Ba10) and 7956 keV *8* from ^{16}O(n,n) (1973Fo11). Γ: weighted average of 79 keV *10* from ^{13}C(α,n) (1967Se07) and 90 keV *9* from ^{16}O(n,n) (1973Fo11). Jπ: From ^{16}O(n,n) (1973Fo11, 1973Jo01).
7.99×10^{3} *5*	1/2−	270 keV *27*	A O	XREF: Others: AD, AG, AJ %n≈94.7; %α≈5.3 Γ_α/Γ=0.053 From Γ_α=14 keV and Γ_n=250 keV (1973Jo01). See also Γ_α/Γ=0.059 *7* (1973Fo11). E(level),Jπ,Γ: From ^{16}O(n,n) (1973Fo11, 1973Jo01).
8068 *10*	3/2+	77 keV *8*	NO	XREF: Others: AD, AG, AJ, AV

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{17}O Levels (continued)

E(level)†	J^π	$T_{1/2}$ or Γ	XREF	Comments
				%n≈83; %α≈17 XREF: N(8079). Γ_α/Γ=7.39 From Γ_α=15 keV and Γ_n=71 keV (1973Jo01). E(level): Average of 8058 keV *8* from ^{16}O(n,n) (1973Fo11) and 8079 keV *8* from ^{13}C(α,n) (1973Ba10). Γ: weighted average of 71 keV *8* from ^{13}C(α,n) (1967Se07) and 85 keV *9* from ^{16}O(n,n) (1973Fo11, 1973Jo01). J^π: From ^{16}O(n,n) (1973Jo01).
8.18×10^3? *2*	1/2$^-$	69 keV *7*		XREF: Others: AG, AJ %n=98.8; %α=1.2 Γα=0.8 keV; Γ_n= 68 keV E(level),J^π,Γ,Γα: From (1973Fo11). See global R-matrix analysis in (1973Jo01). This level was included in (1977Aj02) but was later dropped.
8200 *8*	3/2$^-$	61 keV *10*	A J NOP X	XREF: Others: AD, AE, AG, AJ, AL, AT, AU, BB %n≈92.305; %α≈7.692; %IT≈0.002 $\Gamma_{\gamma 0}$=1.4 eV *5* (1979Jo05) XREF: N(8199)AD(8192)AJ(8207)AT(8240). Γ_α/Γ=7.69 From Γ_α=4 keV and Γ_n=48 keV (1973Jo01). See also Γ_α/Γ=0.077 *8* (1973Fo11). E(level): From 8199 keV *8* from ^{13}C(α,n) (1973Ba10), 8192 keV *10* from ^{15}N(^{3}He,p) (1972Le01), 8210 keV *25* from ^{12}C(^{6}Li,p) (1986Sm10), 8.20E3 keV *1* from ^{16}O(n,γ),(n,n) (1973Fo11) and 8207 keV *10* from ^{16}O(n,n) (1960Ts02). Γ: From 71 keV 5 from ^{13}C(α,n) (1967Se07), Γ=52 keV in ^{16}O(n,n) (1973Fo11), and Γ_α=4 keV and Γ_n=48 keV (1973Jo01). In (1977Aj02) and later, the value Γ=60 keV was given. J^π: From ^{16}O(n,n) (1973Jo01).
8341.70 *26*	1/2$^+$	11.4 keV *5*	NO	XREF: Others: AD, AJ, AU %n=71; %α=29 Γ_n=8.1 keV *3* XREF: N(8350). Γ_n: From (1980Ci03). See also Γ_n=10 keV and Γ_α=2.2 keV from (1973Jo01), Γ_n/Γ_α=6.7 (1957Wa46) and Γ_α/Γ=0.44 (1965Ba32). E(level),Γ: From ^{16}O(n,n) (1980Ci03). See also E_x=8350 keV *4* and Γ=9 keV *3* in ^{13}C(α,n) (1973Ba10,1967Se07). J^π: From ^{17}O(e,e′) (1987Ma52).
8401.63 *7*	5/2$^+$	6.17 keV *13*	J L NO Q T	XREF: Others: AD, AJ, AN, AU, AV %n=77; %α=23 Γ_n=4.75 keV *11* XREF: L(8400). Γ_n: From (1980Ci03). See also Γ_n=4.8 and Γ_α=0.54 from (1973Jo01), Γ_n=3.84 keV and Γ_α=0.16 keV (1967Se07), Γ_n/Γ_α=19 (1957Wa46) and Γ_α/Γ=0.08 (1965Ba32). E(level): From ^{16}O(n,n) (1980Ci03). See also 8408 keV *3* from ^{13}C(α,n) (1973Ba10).

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{17}O Levels (continued)

E(level)†	J^π	$T_{1/2}$ or Γ	XREF	Comments
				Γ: From ^{16}O(n,n) (1980Ci03). See also 5 keV *2* from ^{13}C(α,n),(α,α) (1965Ba32), and 4 keV *3* from ^{13}C(α,n) (1967Se07). J^π: From ^{16}O(n,n) (1973Jo01).
8465.32# *9*	7/2+#	2.13 keV *18*	NOP X Z	XREF: Others: AA, AE, AJ %n=55.2; %α=44.5; %IT=0.3 Γ_n=1.18 keV *4* $\Gamma_{\gamma0}$=6.6 eV *18* (1979Jo05) XREF: N(8473). Γ_n: From (1980Ci03). See also Γ_n=small and Γ_α=7.6 keV from (1973Jo01), Γ_n/Γ_α=31 (1957Wa46) and Γ_α/Γ=0.97 (1965Ba32). This is very poor agreement. E(level): From ^{16}O(n,n) (1980Ci03). See also 8473 keV *3* ^{13}C(α,n) (1973Ba10) and other similar values in ^{12}C(^{6}Li,p),(^{7}Li,d). Γ: From ^{16}O(n,n) (1980Ci03). See also 7 keV *3* in ^{13}C(α,n) (1967Se07) and ^{13}C(^{6}Li,d) (1978Ar15). J^π: Private communication D.J. Millener (2021). In (1993Ti03) the J^π of this level was listed as 9/2+ with a footnote reading "private communication with D.J. Millener"; however, this message did not convey the intended communication. Prior evaluations confirmed the presence of a J^π=7/2+ state at this energy based on, for example, ^{13}C(α,n) (1957Wa46, 1965Ba52) and ^{16}O(n,n) (1973Jo01). Millener had suggested the presence of an additional J^π=9/2+ state in this region based on the ^{17}O(e,e′) data of (1987Ma52) and ^{14}C(^{6}Li,t) (1981Cu11, 1983Cu02, 1983Cu04). We accept this interpretation and list a 7/2+ & 9/2+ doublet.
≈8467	9/2+	<10 keV	JK Q	XREF: Others: AT, AU XREF: AT(8480). E(level),Γ: From ^{17}O(e,e′) (1987Ma52). J^π: See comment on E_x=8467.63 keV J^π=7/2+ state.
8500.08 *12*	5/2−	6.89 keV *22*	NOPQ	XREF: Others: AD, AJ, AU %n=42; %α=58 Γ_n=2.86 keV *4* Γ_n: From (1980Ci03). See also Γ_n=3.4 keV and Γ_α=1.9 keV from (1973Jo01), Γ_n= 4.57 keV and Γ_α=0.43 keV (1967Se07), Γ_n/Γ_α=2.8 (1957Wa46) and Γ_α/Γ=0.26 (1965Ba32). E(level): From ^{16}O(n,n) (1980Ci03). See also 8507 keV *12* from ^{13}C(α,n) (1973Ba10) and 8492 keV *10* ^{15}N(^{3}He,p) (1972Le01). Γ: From ^{16}O(n,n) (1980Ci03). See also 5.0 keV *15* from ^{13}C(α,n),(α,α) (1965Ba32) and 5 keV *3* from ^{13}C(α,n) (1967Se07). J^π: From ^{16}O(n,n) (1973Jo01).
8686.4 *4*	3/2−	55.3 keV *6*	JK NOPQ	XREF: Others: AD, AJ, AT, AU, BB %n=88.4; %α=11.5; %IT=0.002 Γ_n=48.9 keV *11* (1980Ci03) $\Gamma_{\gamma0}$=1.2 eV *6* (1979Jo05)

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{17}O Levels (continued)

E(level)†	J^{π}	$T_{1/2}$ or Γ	XREF	Comments
				Γ_n: From (1980Ci03). See also Γ_n=42 keV and Γ_α=1.8 keV from (1973Jo01), Γ_n/Γ_α=17 (1957Wa46) and Γ_α/Γ=0.06 (1965Ba32). E(level): From ^{16}O(n,n) (1980Ci03). See also 8702 keV *12* from ^{12}C(^{6}Li,p) (1986Sm10) and 8698 keV *5* from ^{13}C(α,n) (1973Ba10). Γ: from ^{16}O(n,n) (1980Ci03). See also 50 keV *3* from ^{13}C(α,n) (1967Se07). J^{π}: From ^{16}O(n,n) (1973Jo01).
8880 *20*	$(7/2^-,9/2^-)$	6 keV	OPQ Z	XREF: Others: AD, AJ, AN, AT, AU %α≈99.93; %IT=0.068 $\Gamma_{\gamma0}$=4.1 eV *8* (1979Jo05) XREF: AJ(8856)AT(8900)AU(8.90E3). Γα: Γ_α/Γ ≈ 1 (1965Ba32). E(level): From 8856 keV *10* ^{16}O(n,n) (1960Ts02) 8880 keV *70* ^{14}N(α,p) (1969Ba17), 8890 keV *40* ^{16}O(α,^{3}He) 8900 keV *20* ^{17}O(e,e′) (1987Ma52) 8900 keV *10* ^{15}N(^{3}He,p) (1972Le01). Γ: From ^{13}C(^{6}Li,d) (1978Ar15). J^{π}: From $(7/2^-)$ in ^{13}C(^{6}Li,d) (1978Ar15) and $(9/2^-)$ in ^{17}O(e,e′) (1987Ma52).
8900 *8*	$3/2^+$	101 keV *3*	JK NOPQ T X	XREF: Others: AE, AK %n<78; %α>22 T=1/2 XREF: K(8900). Γ_n: See Γ_n/Γ_α=3.5 (1957Wa46) and Γ_α/Γ=0.5 (1965Ba32). E(level): From 8905 keV *8* from ^{12}C(^{6}Li,p) (1986Sm10), 8890 keV *30* from ^{15}N(α,d) (1969Lu07) 8896 keV *8* from ^{13}C(α,n) (1973Ba10). J^{π},Γ: From ^{13}C(α,n) (1971Ba06,1967Se07).
8966.5 *16*	$7/2^-$	24.8 keV *24*	J NOPQ	XREF: Others: AD, AF, AJ, AK, AL, AU %n=89; %α=11 Γ_n/Γ=0.894 from Γ_n=23.5 keV and Γ=26.3 keV (1980Ci03). See also Γ_n=23 keV and Γ_α=2.3 keV from (1973Jo01), Γ_n/Γ_α=35 (1957Wa46) and Γ_α/Γ=0.04 (1965Ba32). E(level): From average of 8970 keV *4* from ^{13}C(α,n) (1973Ba10) and 8965.9 keV *16* from ^{16}O(n,n) (1980Ci03). Γ: weighted average of 21 keV *3* from ^{13}C(α,n) (1967Se07) and 26.3 keV *19* from ^{16}O(n,n) (1980Ci03). J^{π}: From ^{16}O(n,n).
9146 *4*	$1/2^-$	4 keV *3*	MNOPQ	XREF: Others: AK, AT, AU, BB %n=55; %α=45; %IT=0.025 $\Gamma_{\gamma1}$=1.44 eV *26* XREF: P(9150)AU(9.15E3). Γ_α/Γ=0.45 (1968Ke02). $\Gamma_{\gamma0}$: From $\Gamma_\alpha\Gamma_{\gamma1}/\Gamma$=0.65 eV *7* (1983Ra29). Using Γ_α/Γ=0.45 gives $\Gamma_{\gamma1}$=1.44 eV *26*. E(level),Γ: From ^{13}C(α,n) (1973Ba10,

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{17}O Levels (continued)

E(level)†	J^π	$T_{1/2}$ or Γ	XREF	Comments
				1967Se07). J^π: From 13C(α,γ) (1983Ra29). The lower member of the 9.15 MeV doublet appears to be populated mainly via γ, n and α reactions on ^{17}O, ^{16}O and ^{13}C, respectively; whilst the higher member is populated via transfer reactions on ^{13}C and ^{15}N.
9158 *10*	9/2$^-$		Q	XREF: Others: AD, AE, AF, AU T=1/2 XREF: AU(9.15E3). E(level): From average of 9160 keV *10* from ^{15}N(^{3}He,p) (1972Le01) and 9137 keV *30* from ^{15}N(α,d) (1969Lu07). J^π: From ^{15}N(α,d). See doublet comment on 9146 keV state.
9181 *9*	7/2$^-$	3 keV	J NOPQ X Z	XREF: Others: AJ, AT, AU %α≈98 XREF: N(9180)Z(9140)AJ(9176)AT(9280). Γ_α/Γ ≈ 0.98 from ^{13}C(α,α_0) (1968Ke02); the resonance was not observed in the (α,n) channel. E(level): From ^{12}C(^{6}Li,p) (1986Sm10). See also (2008Cr03). J^π,Γ: From ^{13}C(^{6}Li,d) (1978Ar15).
9193.47 *9*	5/2$^+$	3.53 keV *13*	K NO	XREF: Others: AJ, AK, AU %n=67; %α=33 Γ_n=2.37 keV *8* XREF: K(9190)N(9199)AJ(9193.47). Γ_n: From (1980Ci03). See also Γ_n=3.86 keV and Γ_α=0.14 keV from (1967Se07), Γ_α/Γ=0.20 (1968Ke02). E(level),Γ: From ^{16}O(n,n) (1980Ci03). See also Γ=4 keV *3* from ^{13}C(α,n) (1967Se07). J^π: From ^{13}C(α,n) (1967Se07).
9420	3/2$^-$	120 keV		XREF: Others: AJ, AU %n=100 Γ_n: Γ_n=Γ (1973Jo01). E(level),J^π,Γ: From ^{16}O(n,n) (1973Jo10).
9491 *4*	5/2$^-$	8 keV *3*	JK NO Q	XREF: Others: AD, AK, AN, AU %n=15; %α=85 Γ_α/Γ=0.85 (1968Ke02). E(level): From 9491 keV 4 ^{13}C(α,n) (1973Ba10), 9487 keV *8* ^{12}C(^{6}Li,p) (2008Cr03), and ^{15}N(^{3}He,p) (1972Le01). Γ: From ^{13}C(α,n) (1967Se07). J^π: From ^{15}N(^{3}He,p) (1972Le01).
9711.57 *14*	7/2$^+$	23.1 keV *3*	JK NO Q X Z	XREF: Others: AD, AJ, AK, AU %n=78; %α=22 Γ_n=18.0 keV *6* XREF: Z(9790). Γ_n: From (1980Ci03). See also Γ_α/Γ=0.70 (1968Ke02). This is rather poor agreement. E(level),Γ: From ^{16}O(n,n) (1981Ci03). J^π: From ^{13}C(α,n) (1971Ba06).
9783.07 *15*	3/2$^+$	11.7 keV *3*	NO T	XREF: Others: AE, AJ, AL, AN %n=88; %α=12 Γ_n=10.3 keV *3*

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{17}O Levels (continued)

E(level)†	J$^{\pi}$	T$_{1/2}$ or Γ	XREF	Comments
				XREF: N(9738). Γ_n: From (1980Ci03). See also Γ_α/Γ=0.90 (1968Ke02). E(level),Γ: From ^{16}O(n,n) (1981Ci03). J$^{\pi}$: From ^{13}C(α,n) (1971Ba06).
9858.70 *15*	(5/2$^-$)	4.01 keV *23*	JKL NOP X	XREF: Others: AD, AJ, AK, AU %n=84; %α=16 Γ_n=3.37 keV *20* XREF: J(9866)L(9800)N(9863)P(9877)X(9.87E3)AD(9856). Γ_n: From (1980Ci03). See also Γ_n=3.86 keV and Γ_α=0.14 keV (1967Se07). E(level),J$^{\pi}$,Γ: From ^{16}O(n,n) (1981Ci03). In (1971Aj02) a single level was indicated at E_x=9.88 MeV with J$^{\pi}$=9/2$^+$. In ^{13}C(α,n) (1973Ba10,1977Aj01) a doublet was identified at this energy. Finally, (1981Ci03) resolved the present two states at E_n=6076 and 6095 keV (E_x=9862 and 9879) with J$^{\pi}$=(5/2$^-$) and (1/2$^-$), respectively.
9876.3 *10*	(1/2$^-$)	16.7 keV *17*	JK N PQ X	XREF: Others: AD, AJ, AU %n=65; %α=35 Γ_n=10.9 keV *12* (1980Ci03) XREF: J(9866)K(9870)N(9876)P(9877)X(9.87E3)AD(9856). E(level),J$^{\pi}$,Γ: From ^{16}O(n,n) (1981Ci03). See comments on ^{17}O(9861).
9975 *20*	5/2$^+$	≈80 keV	NOPQ	XREF: Others: AK %n=22; %α=78 XREF: AK(9994). Γ_α/Γ=0.78 (1968Ke02). E(level),Γ: From ^{13}C(α,n) (1973Ba10). J$^{\pi}$: From (1971Ba06). See also 7/2$^+$ in ^{13}C(α,n) (1968Ke02) and ^{13}C(^{6}Li,d) (1978Ar15).
10044 *20*		≈100 keV	N	XREF: Others: AK %n<100; %α<100 XREF: N(10044)AK(9994). E(level),Γ: From ^{13}C(α,n) (1973Ba10).
10136?	5/2$^+$	138 keV	NOP	%n=15; %α=85 XREF: P(10168). Γ_α/Γ=0.85 (1968Ke02). E(level),Γ: From ^{13}C(α,n) (1968Ke02,1971Ba06) and ^{13}C(^{6}Li,d) (1978Ar15). J$^{\pi}$: From ^{13}C(^{6}Li,d) (1978Ar15). Note: between 1971Aj02 and 1977Aj01 this level was dropped without explanation.
10167.7 *5*	7/2$^-$	49.1 keV *8*	NO	XREF: Others: AJ, AK %n=46; %α=54 Γ_n=22.3 keV *6* Γ_n: From (1980Ci03). See also Γ_α/Γ=0.15 (1968Ke02). E(level),Γ: From ^{16}O(n,n) (1980Ci03) . See also Γ=50 keV *3* from ^{13}C(α,n) (1967Se07). J$^{\pi}$: From ^{13}C(α,n),(α,α) (1968Ke02).
≈10240?	7/2$^+$	122 keV	O	XREF: Others: AD

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{17}O Levels (continued)

E(level)†	J^π	$T_{1/2}$ or Γ	XREF	Comments
				%n=40; %α=60 Γ_α/Γ=0.40 (1968Ke02). E(level),J^π,Γ: From ^{13}C(α,n),(α,α) (1968Ke02).
10335 *15*	(5/2$^+$,7/2$^-$)	150 keV	NO	XREF: Others: AD, AK %n<100; %α<100 E(level),J^π,Γ: From ^{13}C(α,n) (1970Ba10, 1970Ro08).
10421.1 *20*	(5/2$^-$,7/2$^-$)	14 keV *3*	J MNO X	XREF: Others: AT %n<100; %α<100 XREF: AT(10530). E(level): From average of 10422.0 keV *20* ^{13}C(α,n) (1975Be44) and 10419 keV *3* from ^{13}C(α,γ) (1974Be32). Γ: From ^{13}C(α,n) (1963Sp02). J^π: From ^{13}C(α,n) (1970Ro08).
≈10500	(5/2$^+$,7/2$^-$)	75 keV *30*	NO	%n<100; %α<100 Γ: From ^{13}C(α,n),(α,α) (1968Ke02). J^π: From ^{13}C(α,n) (1970Ro08).
10559.1 *6*	(7/2$^-$)	44.5 keV *25*	J NO Q T	XREF: Others: AD, AJ, AK %n=39; %α=61 Γ_{n0}=17.2 keV *7* XREF: N(10558.1)O(10579)AJ(10559.2). Γ_{n0}: From (1980Ci03). Note: the n_1 decay channel is open. E(level): From 10558.1 keV *20* ^{13}C(α,n) (1975Be44) and 10559.2 keV *6* ^{16}O(n,n) (1980Ci03). Γ: weighted average of 45 keV *20* from ^{13}C(α,n),(α,α), 51 keV *2* from ^{13}C(α,n), and 42.5 keV *11* from ^{16}O(n,n). J^π: From ^{16}O(n,n) (1970Lu16).
10694 *8*	(7/2$^+$)	≤25 keV	JK O Z	XREF: Others: AA, AD %n<100; %α<100 E(level): From ^{12}C(^{6}Li,p) (1986Sm10). Note: between 1971Aj02 and 1977Aj01 this level was dropped without explanation. Since then it has been reported in (1986Sm10, 2008Cr03). Γ: From ^{13}C(α,n),(α,α) (1968Ke02). J^π: From ^{14}N(α,p) (1968Ke02).
10777.5 *20*	(1/2$^+$,7/2$^-$)	74 keV *3*	H NO Q	XREF: Others: AD, AJ, AK %n<100; %α<100 E(level),Γ: From ^{13}C(α,n) (1975Be44). J^π: From (1970Ro08).
10911.2 *52*	(5/2$^+$)	43.2 keV *16*	J NO	XREF: Others: AD, AJ, AK %n>63; %α<37 Γ_{n0}/Γ=63.3 from Γ_{n0}=26.4 keV 9 and Γ=41.7 keV *14* (1980Ci03). E(level): From average of 10915.3 keV *13* ^{16}O(n,n) (1981Ci03) and 10904 keV *2* from ^{13}C(α,n) (1975Be44). Γ: weighted average of 46 keV *2* from ^{13}C(α,n) (1975Be44), 60 keV *20* from ^{13}C(α,n),(α,α) (1968Ke02), and 41.7 keV *14*

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{17}O Levels (continued)

E(level)†	J^π	$T_{1/2}$ or Γ	XREF	Comments
				from ^{16}O(n,n) (1980Ci03). J^π: From ^{16}O(n,n) (1980Ci03).
11035 *2*		31 keV *3*	JKL NO	XREF: Others: AD, AJ, AK, AU %n<100; %α<100 T=1/2 XREF: L(11000)AJ(10954). E(level): From average of 11036 keV *2* ^{13}C(α,n) (1975Be44) and 11032 keV *4* ^{15}N(^{3}He,p) (1972Le01). Γ: From ^{13}C(α,n) (1975Be44).
11078.98 *18*	1/2$^-$	2.4 keV *3*	MN	XREF: Others: AD, AJ, AU, BB, BC %n=85.8; %α=13.8; %IT=0.4 T=3/2 T: From ^{18}O(^{3}He,α) (1969De06). Γ_n: Decay branching ratios reported in the literature are Γ_{n0}/Γ=0.79 *7* (1980Ci03, 1981Hi01) and Γ_{n0}/Γ=0.91 *15* and $\Gamma_{n(1+2)}/\Gamma$=0.05 *2* (1973Ad02). In Table 17.11 of (1982Aj01), Fay adopted Γ_{n0}/Γ=0.81 *6* and $\Gamma_{n(1+2)}/\Gamma$=0.05 *2*, this is accepted. $\Gamma_{\alpha0}$: In (1976Mc11), $(\Gamma_{\alpha0}\Gamma_{n0})^{1/2}/\Gamma$=0.23 is reported. Discussion in footnote f of Table 17.11 in (1986Aj04) indicates the above relation is incorrect, but rather $(\Gamma_{\alpha0}\Gamma_{n0})/\Gamma$=0.27 keV ±20% is the correct relationship. We note (1986Aj04) used the former relation, while (1993Ti07) accepted the later. We accept $(\Gamma_{\alpha0}\Gamma_{n0})/\Gamma$=0.27 keV *6*. $\Gamma_{\alpha0}$: Using this and Γ_{n0}/Γ=0.81 *6*, we find $\Gamma_{\alpha0}$=0.33 keV *8*. Taking this and Γ=2.4 keV *3* gives $\Gamma_{\alpha0}/\Gamma$=0.14 *4*. $\Gamma_{\alpha0}$: The value $\Gamma_{\alpha0}/\Gamma$=0.07 *1* sometimes appears in the literature based on $(\Gamma_{\alpha0}\Gamma_{n0})^{1/2}/\Gamma$=0.23 given in (1976Mc11 and an earlier McDonald BAPS talk) and based on Γ_{n0}/Γ=0.91 *15* from (1972ad03); this was used by (1972Ad03) along with Γ=5.0 keV *11* (1976Mc11,BAPS) to obtain $\Gamma_{\alpha0}$=0.3 keV, but the agreement with the present analysis is purely accidental and by chance. $\Gamma_{\gamma1}$: Subsequently, $(\Gamma_{\alpha0}\Gamma_{\gamma1})/\Gamma$=1.46 eV *26* is given in (1983Ra29). Using $\Gamma_{\alpha0}/\Gamma$=0.14 *4* gives $\Gamma_{\gamma1}$=10.5 eV *35*. Note: a previous value that agrees by chance $\Gamma_{\gamma1}$= 11.6 eV *18* was obtained in (1983Ra29) using $\Gamma_{\alpha0}$=0.3 keV and Γ=2.4 keV *3*. E(level): From ^{16}O(n,n) (1980Ci03,1981Hi01). See also 11076 keV *5* ^{13}C(α,n) (1976Mc11) 11075 keV *4* ^{15}N(^{3}He,p) (1972Le01) and 11082 keV *6* ^{18}O(^{3}He,α) (1969De06). Γ: From ^{16}O(n,n) (1980Ci03,1981Hi01). See also 5.0 keV *11* from ^{13}C(α,n) (1976Mc11, and earlier 1971 BAPS). J^π: From ^{18}O(d,t) (1981Ma14).

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{17}O Levels (continued)

E(level)†	J$^{\pi}$	T$_{1/2}$ or Γ	XREF	Comments
11237 *2*	(3/2$^-$,7/2$^+$)	80.0 keV *25*	K NO X	XREF: Others: AK, AL, AQ %n<100; %α<100 XREF: O(11252)AK(11283)AQ(11200). E(level),Γ: From ^{13}C(α,n) (1975Be44). J$^{\pi}$: from ^{13}C(α,n) (1970Ro08).
≈11515	≥3/2	≈190 keV		XREF: Others: AJ, AK, BB %n<100; %α<100 XREF: BB(11410). E(level): From ^{16}O(n,n) (1961Fo07, 1959Ha13, 1970Lu16). See also 11410 from ^{18}O(d,t) (1977Ma10) and 11574 keV from ^{16}O(n,α) (1963Da12). J$^{\pi}$,Γ: From ^{16}O(n,n). See also ≈126 keV from ^{16}O(n,α) (1963Da12).
11622 *2*		65 keV *2*	N	%n<100; %α<100 E(level),Γ: From ^{13}C(α,n) (1975Be44).
11750 *10*		40 keV *25*	N Q	XREF: Others: AK, AU %n<100; %α<100 E(level),Γ: From ^{13}C(α,n) (1963Sp02). See also 11.71 MeV *5* ^{17}O(e,e′) (1977No06).
11815 *13*	7/2$^+$	12 keV *3*	JKL N PQ X	%n<100; %α<100 E(level): From average of 11815 keV *13* ^{12}C(^{6}Li,p),(^{7}Li,d) (2008Cr03) and 11816 keV *15* ^{13}C(α,n) (1963Sp02). J$^{\pi}$: From (2008Cr03). Γ: From ^{13}C(α,n) (1963Sp02).
11875?		≈125 keV		XREF: Others: AK %n<100; %α<100 XREF: AK(11875). E(level),Γ: From ^{16}O(n,α) (1963Da12). Not reported in any other study.
11.95×10^3? *5*	≥3/2	≈250 keV		XREF: Others: AJ, AU %n<100 XREF: AU(11.95E3). E(level),Γ: From ^{17}O(e,e′) (1977No06). J$^{\pi}$: From ^{16}O(n,n) (1961Fo07). See also discussion on E$_x$=12007 keV.
12007 *10*	9/2$^+$	<50 keV	H JK N X Z	XREF: Others: AA, AK %n<100; %α<100 XREF: Z(12000). E(level),J$^{\pi}$,Γ: From ^{12}C(^{6}Li,p)(^{7}Li,d) (1986Sm10,2008Cr03), and ^{13}C(α,n) (1963Sp02). In previous reviews, a broad state bear 12.0 MeV was listed. In the present evaluation, we find evidence for a broad state near 11.95 MeV and a narrow state at 12007 keV.
12118 *10*		150 keV *50*	N T	XREF: Others: AJ, BB %n<100; %α<100 T=1/2 T: From ^{18}O(d,t) (1977Ma10). E(level): From average of 12109 keV *20* ^{13}C(α,n) (1963Sp02) and 12120 keV *10* ^{18}O(d,t) (1977Ma10). Γ: From ^{13}C(α,n) (1963Sp02).

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{17}O Levels (continued)

E(level)†	J^π	$T_{1/2}$ or Γ	XREF	Comments
12229‡ *16*	7/2$^-$	≤20 keV	JK	XREF: Others: AU E(level): From average of 12220 keV *20* ^{17}O(e,e′) (1987Ma52), 12239 keV *16* ^{12}C(^{6}Li,p) (1986Sm10,2008Cr03), 12220 keV *26* ^{12}C(^{7}Li,d) (2008Cr03). J^π: From ^{12}C(^{6}Li,p),(^{7}Li,d) (2008Cr03). Γ: From ^{17}O(e,e′) (1987Ma52).
12274 *15*	(7/2$^+$)	100 keV *30*	N X	XREF: Others: AK, AL %n<100; %α<100 T=1/2 E(level),Γ: From ^{13}C(α,n) (1963Sp02). J^π: From ^{14}C(^{6}Li,t) (1983Cu02).
12384 *20*		130 keV	N PQ	XREF: Others: AJ %n<100; %α<100 E(level): From ^{13}C(α,n) (1963Sp02). Γ: From ^{16}O(n,n) (1961Fo07).
12424 *13*	9/2$^+$	<50 keV	JK N Z	%n<100; %α<100 XREF: N(12420). E(level): From average of 12428 keV *13* ^{12}C(^{6}Li,p) (1986Sm10, 2008Cr03), 12420 keV *26* ^{12}C(^{7}Li,d) (2008Cr03) and 12420 keV *15* ^{13}C(α,n) (1963Sp02). J^π,Γ: From ^{12}C(^{6}Li,p),(^{7}Li,d) (1986Sm10).
12467.0 *6*	3/2$^-$	7.2 keV *11*	N	XREF: Others: AJ, AU, BB, BC %n>18; %α<82 T=3/2 Γ_{n0}=1.27 keV *14* XREF: N(12458). T: From ^{18}O(^{3}He,t) (1969De06), ^{18}O(d,t) (1981Ma14) ^{16}O(n,n) (1976Mc11, 1981Hi01). Γ_{n0}: from (1980Ci03). E(level),Γ: From ^{16}O(n,n) (1980Ci03,1981Hi01). See also 12458 keV *5* in ^{13}C(α,n) (1976Mc11) and 12471 keV *5* in ^{18}O(^{3}He,α) (1969De06). Γ: weighted average of 8 keV *2* from ^{13}C(α,n) and 6.9 keV *11* from ^{16}O(n,n). J^π: From ^{13}C(α,n) (1976Mc11).
12595 *15*		75 keV *30*	N	%n<100; %α<100 E(level),Γ: From ^{13}C(α,n) (1969Sp02).
12669 *15*	(3/2$^-$,9/2$^+$)	75 keV	N	XREF: Others: AJ, AU %n<100; %α<100 E(level),J^π,Γ: From ^{13}C(α,n) (1969Sp02,1970Ro08). See also 12660 keV *50* ^{17}O(e,e′) (1977No06). Γ: Beginning in (1971Aj02) the Γ for this level was listed at ≈5 keV attributed to ^{13}C(α,n) (1969Sp02). However this was a typo. (1969Sp02) report ≈75 keV. Also see ≈90 keV ^{17}O(e,e′) and ≈95 keV in ^{16}O(n,n).
12760 *26*		<70 keV	JK N Z	XREF: Others: BB %n<100; %α<100 T=1/2 XREF: N(12812)Z(12740).

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{17}O Levels (continued)

E(level)†	J$^{\pi}$	T$_{1/2}$ or Γ	XREF	Comments
				T: From ^{18}O(d,t) (1977Ma10). E(level): From ^{12}C(^{6}Li,p),(^{7}Li,d) (2008Cr03), where it is best resolved. See also 12760 keV *10* from ^{18}O(d,t) (1977Ma10: uncertainties seem underestimated) and 12812 keV *25* from ^{13}C(α,n) (1963Sp02: the peak is poorly resolved). Γ: From ^{12}C(^{6}Li,p),(^{7}Li,d) (2008Cr03).
12927 *20*	(1/2^{+},7/2^{-})	≥150 keV	N	%n<100; %α<100 XREF: N(12927). E(level),J$^{\pi}$,Γ: From ^{13}C(α,n) (1963Sp02,1970Ro08).
12944 *6*	1/2^{+}	6 keV *2*	N	XREF: Others: AJ, AU, BB, BC %n>3.5; %α<96.5 T=3/2 Γ$_{n0}$=0.21 keV *14* XREF: N(12944). T: From ^{13}C(α,n) (1976Mc11), ^{18}O(^{3}He,α) (1969De06), ^{16}O(n,n) (1981Hi01). Γ$_{n0}$: from (1981Hi01). E(level): From 12941 keV *6* ^{16}O(n,n) (1981Hi01) 12944 keV *6* ^{13}(α,n) (1976Mc11) 12950 keV *8* ^{18}O(^{3}He,α) (1969De06). J$^{\pi}$: From ^{18}O(d,t), ^{18}O(^{3}He,α). Γ: From ^{16}O(n,n) (1976Mc11).
12999.5 *6*	5/2^{-}	2.5 keV *10*	N X	XREF: Others: AJ, AU, BC %n>16; %α<84 T=3/2 Γ$_{n0}$=0.40 keV *6* T: From ^{13}C(α,n) (1976Mc11) and ^{18}O(^{3}He,α) (1969De06). Γ$_{n0}$: from (1981Hi01). E(level),J$^{\pi}$,Γ: From ^{16}O(n,n) (1976Mc11,1980Ci03,1981Hi01). Others 12993 keV *6* ^{13}C(α,n) and 12994 *8* ^{18}O(^{3}He,α).
13072 *15*	(3/2^{-})	16 keV *4*	JK N	%n<100; %α<100 E(level): From weighted average of 13070 keV *26* ^{12}C(^{6}Li,p) (2008Cr03), 13060 keV *26* ^{12}C(^{7}Li,d) (2008Cr03) and 13076 keV *15* ^{13}C(α,n) (1963Sp02). Γ: From ^{13}C(α,n) (1963Sp02). J$^{\pi}$: From ^{17}O(γ,n) (1985Ju02).
13484 *15*	(9/2^{+})	≈120 keV	N	XREF: Others: AA, AL %n<100; %α<100 E(level),Γ: From ^{13}C(α,n) (1963Sp02). J$^{\pi}$: From ^{14}N(^{6}Li,^{3}He) (1984Et01).
13580‡ *20*	(11/2^{-},13/2^{-})	68 keV *19*	E H JKL PQ T Z	XREF: Others: AU XREF: P(13.58E3)T(13.3E3)AU(13.58E3). E(level),Γ: From ^{17}O(e,e′) (1987Ma52). J$^{\pi}$: The J$^{\pi}$=11/2^{-},13/2^{-} interfering doublet at 13.6 MeV is discussed in (1987Ca30). In ^{13}C(^{6}Li,d) (1978Ar15) E$_{x}$=13580 keV *20*, J$^{\pi}$=(13/2^{-}) and a broader ≈200 keV width are

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{17}O Levels (continued)

E(level)†	J^{π}	$T_{1/2}$ or Γ	XREF	Comments
				preferred. On the other hand in ^{17}O(e,e′) (1987Ma52) the same E_x is found with a narrower Γ=68 keV and a preference of ($11/2^-$). With no substantially new results, we maintain the interpretation of (1993Ti07).
13610 *15*		≈200 keV	E N	XREF: Others: AU %n<100; %α<100 XREF: E(13.6E3)AU(13.58E3). E(level),Γ: From ^{13}C(α,n) (1963Sp02).
13636.9 *24*	$5/2^+$	9 keV *5*	X	XREF: Others: AJ, BB, BC %n>2.7 T=3/2 Γ_{n0}=0.024 keV *9* XREF: AJ(13636.9). T: From ^{16}O(n,n) (1981Hi01), ^{18}O(^{3}He,α) (1969De06), ^{18}O(d,t) (1981Ma14). Γ_{n0}: From (1981Hi01). E(level): From 13641.9 keV *24* (1981Hi01). See also 13640 keV *5* ^{18}O(^{3}He,α) (1969De06). Γ: From ^{16}O(n,n) (1981Hi01). J^{π}: From ^{14}C(^{6}Li,t) (1981Cu11,1983Cu02,1983Cu04), ^{18}O(d,t) (1981Ma14).
13644?		400 keV		XREF: Others: AJ %n≤100 XREF: AJ(13644). E(level),Γ: From ^{16}O(n,n) (1961Fo07).
14.15×10^3 *10*	($9/2^+$,$11/2^+$)	≈150 keV	P	XREF: Others: AL, AU XREF: AU(14.14E3). E(level),J^{π},Γ: from ^{13}C(^{6}Li,d) (1978Ar15). Γ: from Γ=200 keV (1978Ar15) and Γ≈100 keV ^{17}O(e,e′) (1977No06). J^{π}: ($11/2^+$) is slightly preferred.
14232.3 *15*	$7/2^-$	20.5 keV *16*		XREF: Others: AJ, AU, BC %n>10 T=3/2 Γ_{n0}=2.07 keV *16* T: From ^{16}O(n,n) (1981Hi01), ^{18}O(^{3}He,α) (1969De06). Γ_{n0}: From (1981Hi01). E(level),Γ: From ^{16}O(n,n) (1981Hi01). See also 14219 keV *8* in ^{18}O(^{3}He,α) (1969De06). J^{π}: From ^{17}O(e,e′). See also ($7/2^-$) in ^{16}O(n,n).
14288 *3*		7.5 keV *4*		XREF: Others: AJ, BC %n≤100 T=3/2 E(level),Γ: From ^{16}O(n,n) (1981Hi01). See also 14282 keV *12* ^{18}O(^{3}He,α) (1969De06). T: From ^{16}O(n,n) (1981Hi01) and

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{17}O Levels (continued)

E(level)†	J^π	$T_{1/2}$ or Γ	XREF	Comments
				^{18}O(^{3}He,α) (1969De06). In (1990Mc06), T=1/2 is assigned based on ^{17}O(γ(14380 keV),n_0), but those results appear uncertain because of persistent energy calibration issues.
14453 *3*		40 keV *6*		XREF: Others: AJ, AU %n≤100 E(level),Γ: From ^{16}O(n,n) (1981Hi01).
14550‡ *26*			K	E(level): From ^{12}C(^{7}Li,d) (2008Cr03). Γ: Relatively narrow.
14720‡ *20*	9/2$^-$	35 keV *11*	K	XREF: Others: AQ, AU T=3/2 T: From ^{17}O(e,e′) (1983Ra27). E(level),J^π,Γ: From ^{17}O(e,e′) (1987Ma52). See also 14720 keV *26* ^{12}C(^{7}Li,d) (2008Cr03).
14.76×10^3 *10*	7/2$^-$	≈340 keV	PQ T X	XREF: Others: AJ, AL, AU %n≤100 XREF: P(14760)Q(14600)T(14600)AJ(14585)AU(14.76E3). E(level): From ^{17}O(e,e′) (1977No06). Γ: From ^{16}O(n,n) (1961Fo07). J^π: From ^{14}C(^{6}Li,t), see (1981Cu11,1983Cu02,1983Cu04).
14793 *3*	1/2$^-$	36 keV *13*		XREF: Others: AJ %n<100 T=3/2 E(level),J^π,Γ,T: From ^{16}O(n,n) (1981Hi01).
14880 *26*	(15/2$^+$)		H JK Q	XREF: Others: AA %α<100 XREF: K(14880)Q(14860). E(level): From ^{12}C(^{6}Li,p)(^{7}Li,d) (2008Cr03). J^π: From ^{14}N(^{6}Li,^{3}He) (1984Et01). Γ: Narrow, see (2008Cr03).
14961	(5/2$^+$)	≈155 keV		XREF: Others: AC, AJ %n<100; %α<100 E(level),Γ: From 14961 keV and Γ≈180 keV ^{16}O(n,n) (1961Fo07) and 14980 keV and Γ≈100 keV ^{15}N(d,α) (1966Ti03).
15.10×10^3 *10*	(9/2$^+$,11/2$^+$)	0.40 MeV *15*	P	XREF: Others: AC, AT %p<100; %α<100; %IT>0 XREF: AC(15148)AT(15.06E3). E(level),J^π,Γ: From (1978Ar15). 11/2$^+$ is preferred in (1978Ar15). See also (5/2$^-$,7/2$^-$) in (1966Ti03) ^{15}N(d,α).
15101‡ *8*			K	XREF: Others: AU, BC T=3/2 XREF: AU(15.10E3). T: From ^{18}O(^{3}He,α) (1969De06). E(level): From 15070 keV *26* ^{12}C(^{7}Li,d) (2008Cr03) and 15101 keV *8* ^{18}O(^{3}He,α)

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{17}O Levels (continued)

E(level)†	J^π	$T_{1/2}$ or Γ	XREF	Comments
				(1969De06). Γ: narrow; see ^{17}O(e,e′) (1983Ra27).
15202 *3*	3/2$^+$	52 keV *14*	X	XREF: Others: AB, AJ, AU %n<100; %p<100 T=3/2 XREF: AB(15245)AU(15.24E3). T: From ^{16}O(n,n) (1981Hi01). In (1990Mc06), T=1/2 is assigned, but those results appear uncertain because of persistent energy calibration issues. E(level),Γ: From (1981Hi01). J^π: From ^{17}O(e,e′) (1983Ra27), ^{14}C(^{6}Li,t) (1981Cu11,1983Cu02,1983Cu04) and ^{16}O(n,n′) (1981Hi01). See also (5/2$^-$,7/2$^-$) for a broad level at 15.15 MeV reported in ^{15}N(d,α) (1966Ti03).
15371 *3*	(5/2$^+$)	40 keV *6*		XREF: Others: AJ %n≤100 T=3/2 E(level),Γ,J^π,T: From ^{16}O(n,n) (1981Hi01). J: from comparison with ^{17}N analog states.
15620 *26*			JK	XREF: Others: AB, AC %p<100; %α<100 E(level): From (2008Cr03) ^{12}C(^{6}Li,p)(^{7}Li,d).
15787 *20*	(13/2$^-$)	<30 keV	K	XREF: Others: AB, AL, AU, AV %p≤100 T=(1/2) XREF: AB(15721). E(level): From average of 15780 keV *20* ^{16}O(e,e′) (1986Ma48) and 15800 keV *26* ^{12}C(^{7}Li,d) (2008Cr03). Γ: From (1986Ma48). J^π,T: From (1987Mi25): See comments, replies and discussion in (1987Mi25) and (1986Ma48, 1987Ma40). The state was initially identified in ^{17}O(e,e′) (1986Ma48) as (9/2$^-$; T=3/2).
15.95×10^3 *15*	(9/2$^+$,11/2$^+$)	0.40 MeV *15*	E P	XREF: Others: AB, AC %n<100; %p<100; %α<100; %IT>0 XREF: E(16.1E3)AB(16162)AC(15800). E(level),J^π,Γ: From (1978Ar15). 9/2$^+$ is preferred. See also ≈15.8 MeV and Γ≈300 keV (1976Ca28). (1990Mc06) suggest a broad T=1/2 state in ^{17}O(γ,n) around E_x=15.6 MeV. It may be this state?
16247 *4*	(9/2$^+$)	21 keV *10*	E X	XREF: Others: AJ, AU %n<100 T=3/2 XREF: AU(16500). T: From ^{16}O(n,n) (1981Hi01). E(level),Γ: From (1981Hi01) ^{16}O(n,n),(n,n). See also 16.50 MeV *2* and ≤ 20 keV from ^{17}O(e,e′) (1986Ma48).

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{17}O Levels (continued)

E(level)†	J^{π}	$T_{1/2}$ or Γ	XREF	Comments
				J^{π}: From (1981Cu11,1983Cu02,1983Cu04) ^{14}C(^{6}Li,t).
16578‡ *12*	$3/2^{-}$	≈300 keV		XREF: Others: AU, BB T=3/2 XREF: AU(16.52E3). T: From ^{18}O(d,t) (1977Ma10, 1981Ma14). E(level): From 16.52 MeV *5* ^{17}O(e,e′) (1977No06) and 16580 keV *10* (1977Ma10). J^{π}: From ^{18}O(d,t) (1981Ma14). Γ: From ^{17}O(e,e′) (1977No06).
16.60×10^{3}‡ *15*	$(11/2^{-},13/2^{-})$		P	E(level),J^{π}: From ^{13}C(^{6}Li,d) (1978Ar17). $11/2^{-}$ is preferred.
17060‡ *20*	$(11/2^{-})$	<20 keV	P	XREF: Others: AL, AU, AV T=(1/2) E(level),Γ: From ^{17}O(e,e′) (1986Ma48). J^{π},T: From (1987Mi25): See comments, replies and discussion in (1987Mi25) and (1986Ma48, 1987Ma40). The state was initially identified in ^{17}O(e,e′) (1986Ma48) as ($7/2^{-}$; T=3/2). Also see ($7/2^{-}$) in ^{16}O(p,π+) (1988Hu02)and (($11/2^{-}$ preferred),$13/2^{-}$) in ^{13}C(^{6}Li,d) (1978Ar15).
17441 *11*		66 keV *20*		XREF: Others: AJ %n<100 T=3/2 E(level),Γ,T: From ^{16}O(n,n) (1981Hi01).
17920 *20*		98 keV *16*		XREF: Others: AU E(level),Γ: From ^{17}O(e,e′) (1986Ma48).
18115 *4*	$3/2^{-}$	46 keV *12*	Q X	XREF: Others: AJ, AT, BB %n≤100 T=3/2 XREF: Q(18170)AT(18.09E3). E(level),Γ: From 18122 keV *4* ^{16}O(n,n) (1981Hi01). See also 18140 keV *10* ^{18}O(d,t) (1977Ma10) and 18.09 MeV *7* ^{17}O(γ,p) (1992Zu01). J^{π}: From ^{18}O(d,t) (1981Ma14). T: From ^{18}O(d,t) (1977Ma10, 1981Ma14), ^{16}O(n,n) (1981Hi01).
18720‡ *20*		87 keV *33*		XREF: Others: AU E(level),Γ: From ^{17}O(e,e′) (1986Ma48). Also see 18.5 MeV (1990Mc06) from reanalysis of 19.0 MeV in ^{17}O(γ,n) (1979Jo05).
18830‡ *20*		≤20 keV	T	XREF: Others: AU E(level),Γ: From ^{17}O(e,e′) (1986Ma48), Also see 18.90 MeV *14* ^{13}C(^{13}C,^{9}Be) (1979Br04).

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{17}O Levels (continued)

E(level)†	J^π	$T_{1/2}$ or Γ	XREF	Comments
19.28×10^3? *7*		>0.75 MeV	Y	XREF: Others: AT %IT>0 E(level),Γ: From ^{17}O(γ,p) (1992Zu01).
19.60×10^3‡ *15*	(13/2$^+$,15/2$^+$)	250 keV	H PQ	XREF: H(19.0E3)Q(19240). E(level),J^π,Γ: From ^{13}C(^{6}Li,d) (1978Ar15). 15/2$^+$ is preferred.
19820 *40*	3/2$^-$	550 keV *50*	Y	XREF: Others: AU %IT>6×10^{-4} $\Gamma_{\gamma0}$≥1 eV; $\Gamma_{\gamma1}$≥2.3 eV XREF: Y(19.76E3). Γ_γ: From (1980Li05). E(level),Γ: From 19760 keV *60* ^{14}N(t,γ) (1980Li05) and 19850 keV *40* ^{17}O(e,e′) (1986Ma48). Γ from 0.55 MeV *5* from (1980Li05) and 0.53 MeV *15* from (1986Ma48). J^π: From (1980Li05).
20140‡ *20*	(11/2$^-$)	31 keV *5*		XREF: Others: AU T=3/2 E(level),Γ: From ^{17}O(e,e′) (1986Ma48). J^π,T: From (1987Mi25): See comments, replies and discussion in (1987Mi25) and (1986Ma48, 1987Ma40). The state was initially identified in ^{17}O(e,e′) (1986Ma48) as (13/2$^-$; T=1/2).
20.20×10^3‡ *15*	(13/2$^+$,15/2$^+$)	≈250 keV	P	E(level),J^π,Γ: From ^{13}C(^{6}Li,d) (1978Ar15). 15/2$^+$ is preferred.
20390 *50*	(5/2$^-$,7/2$^-$)	660 keV *70*	Y	XREF: Others: AT %IT>6.5×10^{-4} %IT>0 $\Gamma_{\gamma1}$≥4.3 eV $\Gamma_{\gamma1}$: From (1980Li05). E(level),Γ: From ^{14}N(t,γ) (1980Li05), see also 20.33 MeV *7* (1992Zu01). J^π: 5/2$^-$ from (1980Li05); E1 to ^{17}O(0:5/2$^+$). See also (7/2$^-$) in ^{17}O(γ,p) (1992Zu01).
20580 *50*	1/2$^+$	570 keV *80*	V Y	XREF: Others: AJ, AU %IT≥9×10^{-4}; %n≤99.999 T=(1/2) $\Gamma_{\gamma1}$>5.1 eV XREF: AJ(20417)AU(20.5E3). T: From ^{16}O(n,n) (1970Bo30). $\Gamma_{\gamma1}$: From (1980Li05). Γ_n: Γ_n≈Γ ^{16}O(n,n) (1970Bo30). E(level),J^π,Γ: from ^{14}N(t,γ) (1980Li05). M1 to ^{17}O(871:1/2$^+$).
20700‡ *20*	(9/2$^-$)	<20 keV		XREF: Others: AU T=(3/2) E(level),Γ: From ^{17}O(e,e′)

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{17}O Levels (continued)

E(level)†	J^π	$T_{1/2}$ or Γ	XREF	Comments
				(1986Ma48). J^π,T: From (1987Mi25): See comments, replies and discussion in (1987Mi25) and (1986Ma48, 1987Ma40). The state was initially identified in ^{17}O(e,e′) (1986Ma48) as (11/2$^-$; T=3/2).
21050 *50*	(3/2$^-$)	470 keV *60*	V Y	%IT>0 %IT>0.0026 $\Gamma_{\gamma0}\geq$5.8 eV; $\Gamma_{\gamma1}\geq$6.5 eV E(level),J^π,Γ: From ^{14}N(t,γ) (1980Li05). E1 to ^{17}O(0:5/2$^+$, 871:1/2$^+$); see also 7/2$^-$ from ^{17}O(γ,n/p). Γ_γ: From (1980Li05).
21200‡	(13/2$^+$,15/2$^+$)		P	XREF: P(21.2E3). E(level),J^π: From ^{13}C(^{6}Li,d) (1978Ar15). 13/2$^+$ is preferred.
21.72×10^3 *8*	5/2$^+$	750 keV	V	%IT>0; %α<100 E(level): From ^{14}C(^{3}He,γ) (1976Ch04).
22.13×10^3 *8*	7/2$^-$	750 keV	P V	XREF: Others: AT, AU %IT>0; %n<100; %α<100; %p<100 XREF: P(22.1E3)AT(22.17E3)AU(22.0E3). E(level): From ^{14}C(^{3}He,γ) (1976Ch04), see also 22.17 MeV *10* ^{17}O(γ,p) (1992Zu01).
22.54×10^3 *17*	3/2$^{(-)}$	≈1 MeV	V	XREF: Others: AU %IT>0 XREF: AU(22.0E3). E(level): From ^{14}C(^{3}He,γ) (1976Ch04).
22.96×10^3 *8*	1/2$^+$	≈0.4 MeV	V	XREF: Others: AT %IT>0; %p<100 XREF: AT(23.1E3). E(level): From ^{14}C(^{3}He,γ) (1976Ch04), see also 23.1 MeV *1* ^{17}O(γ,p) (1992Zu01).
23.45×10^3 *8*			V	%IT>0 E(level): From ^{14}C(^{3}He,γ) (1976Ch04).
24.44×10^3 *8*			V	XREF: Others: AT %IT>0; %p<100 XREF: AT(24.4E3). E(level): From ^{14}C(^{3}He,γ) (1976Ch04), see also 24.4 MeV *1* ^{17}O(γ,p) (1992Zu01).
26.50×10^3? *15*				XREF: Others: AT %IT>0; %p<100 XREF: AT(26.50E3). E(level): From ^{17}O(γ,p) (1992Zu01).

† *Decay probabilities* are listed as "%n≤100, %α≤100" for levels populated in either ^{16}O(n,α) or ^{13}C(α,n) and when no further information is available. Similarly, "%n≤100" or "%α≤100" is given for population in, for example, ^{16}O(n,n) or ^{15}N(d,α), respectively. Levels populated in ^{17}O(γ,X) are listed with %IT>0 or with $\Gamma_{\gamma0}$ and %IT from the reported values, but the decay transitions are not given. It appears that in past evaluations several levels were associated with α decay based on their population via ^{18}O(^{3}He,α), and with γ decay based on their population in ^{17}O(e,e′).

‡ Decay mode not specified.

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{17}O Levels (continued)

States at E_x:J=5869.62:3/2$^+$, 6860.6:5/2$^+$, 7573.5:7/2$^+$, and 8467.63:9/2$^+$ are well reproduced by simple Bansal-French type weak-coupling calculations and are considered 5p4h in nature (priv. comm. J. Millener (2021)).

γ(^{17}O)

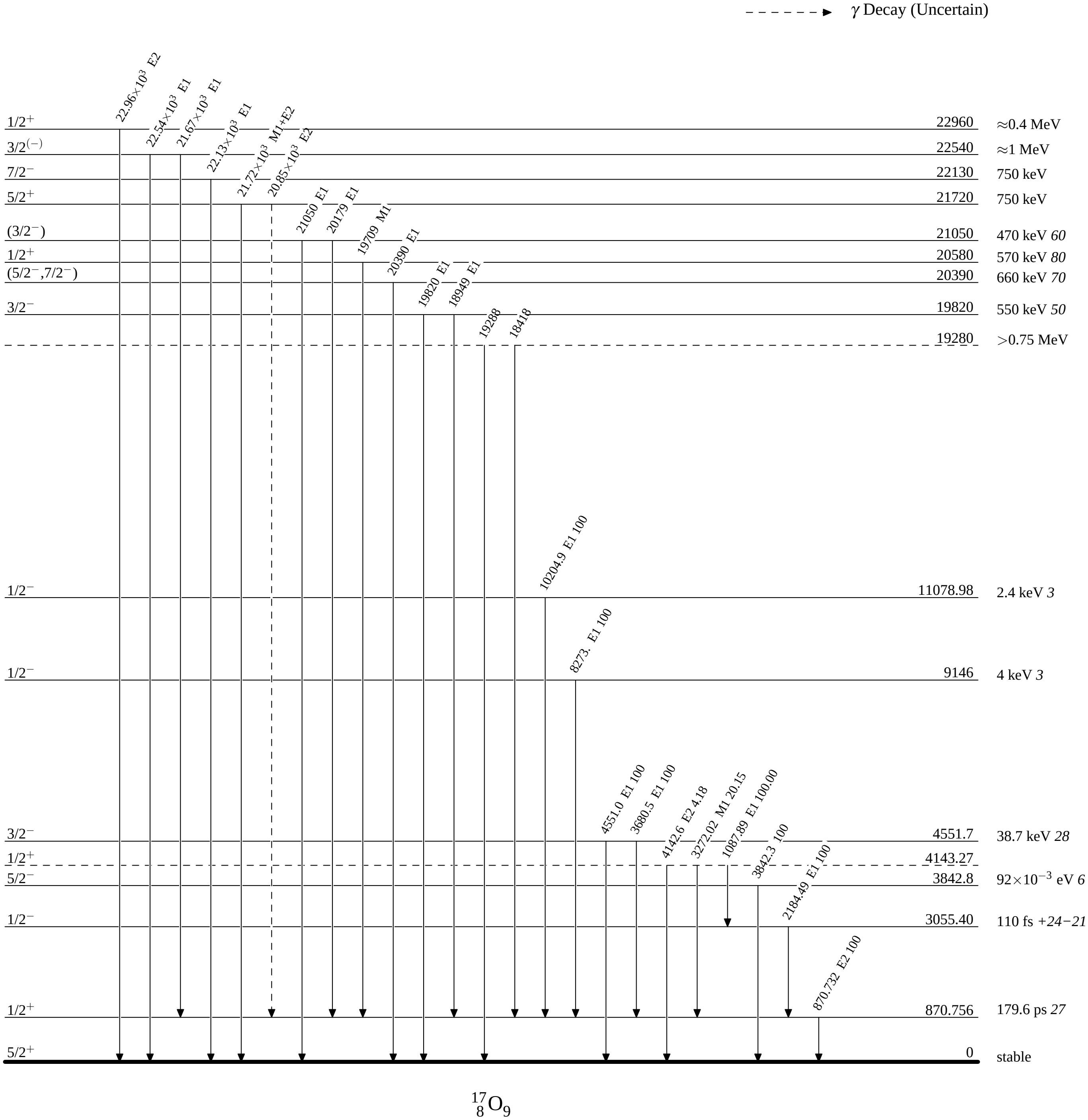
E_i(level)	J_i^π	E_γ†	I_γ	E_f	J_f^π	Mult.	Comments
870.756	1/2$^+$	870.732 *20*	100	0	5/2$^+$	E2	B(E2)(W.u.)=2.424 *37* E_γ: Precisely reported γ-ray energies are 870.76 *4* from ^{16}O(n,γ):E=thermal (2016Fi04) and 870.725 *20* from ^{16}O(d,pγ) from (1980Wa24).
3055.40	1/2$^-$	2184.49 *5*	100	870.756	1/2$^+$	E1	B(E1)(W.u.)=8.9×10^{-4} *+22−16* E_γ=2184.49 *5* is reported in ^{16}O(n,γ):E=thermal (2016Fi04) See also 2184.3 *+3−2* keV (2020Zi03).
3842.8	5/2$^-$	3842.3 *4*	100	0	5/2$^+$		B(E1)(W.u.)=3.6×10^{-3} *2*
(4143.27)	1/2$^+$	1087.89 *4*	100.00 *62*	3055.40	1/2$^-$	E1	
		3272.02 *8*	20.15 *50*	870.756	1/2$^+$	M1	
		4142.6 *6*	4.18 *30*	0	5/2$^+$	E2	
4551.7	3/2$^-$	3680.5 *7*	100	870.756	1/2$^+$	E1	B(E1)(W.u.)=8.3×10^{-2} *2*
		4551.0 *7*	100	0	5/2$^+$	E1	B(E1)(W.u.)=4.2×10^{-2} *8*
9146	1/2$^-$	8273. *4*	100	870.756	1/2$^+$	E1	B(E1)(W.u.)=5.7×10^{-3} *10*
11078.98	1/2$^-$	10204.9 *2*	100	870.756	1/2$^+$	E1	B(E1)(W.u.)=2.5×10^{-2} *4*
19.28×10$^{3?}$		18418		870.756	1/2$^+$		
		19288		0	5/2$^+$		
19820	3/2$^-$	18949		870.756	1/2$^+$	E1	
		19820		0	5/2$^+$	E1	
20390	(5/2$^-$,7/2$^-$)	20390		0	5/2$^+$	E1	
20580	1/2$^+$	19709		870.756	1/2$^+$	M1	
21050	(3/2$^-$)	20179		870.756	1/2$^+$	E1	
		21050		0	5/2$^+$	E1	
21.72×10^3	5/2$^+$	20.85×10^3‡		870.756	1/2$^+$	E2	
		21.72×10^3		0	5/2$^+$	M1+E2	
22.13×10^3	7/2$^-$	22.13×10^3		0	5/2$^+$	E1	
22.54×10^3	3/2$^{(-)}$	21.67×10^3		870.756	1/2$^+$	E1	
		22.54×10^3		0	5/2$^+$	E1	
22.96×10^3	1/2$^+$	22.96×10^3		0	5/2$^+$	E2	

† From energy level difference, except where noted.
‡ Placement of transition in the level scheme is uncertain.

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level



^{17}N β^- decay

Parent: ^{17}N: E=0; J^π=1/2$^-$; $T_{1/2}$=4.173 s *4*; Q(β^-)=8679 *15*; %β^- decay=100
^{17}N-Q(β^-): from (2021Wa16).
^{17}N-$T_{1/2}$: weighted average of: 4174 ms *4* (1976Oh05) and 4169 ms *8* (1972Al42). Also see 4.14 s *4* (1948Kn24), 4.20 s *8* (1961Hi01), 4.16 s *1* (1965Do13), 4.17 s *2* (1970Me31), 4.15 s *10* (1976Fi03), 4.4 s *2* (1984In01), 4.23 s *49* (1991Re02) and (2008RiZX: 4.19 s *2*, 4.12 s *3*).
Foreword:

The measurements of β-delayed neutrons from ^{17}N decay are relatively consistent in both the energies and relative intensities of neutron groups. Most efforts did not determine the absolute feeding intensities to neutron groups, but rather the relative intensities of neutron groups are reported. The determination of “absolute” intensities relies on a renormalization using an assumption of %β-n=100−(4.66 *75*))=(95.34 *75*)%, where 4.66 *75* is the feeding to neutron-bound states (1964Si06).

1964Si06: ^{17}N activity was produced in thin-walled cells comprised of either aluminium or stainless steel using the ^{15}N(t,p) reaction. A NaI detector observed the γ-ray spectrum obtained in measurements on the stainless steel cell; transitions at E_γ= 870 and 2190 keV were observed with a relative ratio=(6.8 *9*):1.0. Since the 2190 transition corresponds to a cascade from ^{17}O*(3055) to ^{17}O*(870), the relative feeding of the first and second excited states is (5.8 *9*):1.0 . Care was taken to minimize contributions from n+p capture that could interfere with the E_γ=2190 keV analysis. No other γ-rays were observed; in particular transitions from ^{17}O*(3843:J^π=5/2$^-$) and transitions in ^{16}O were not observed.

The measurements on the aluminium cell were analyzed to obtain the singles β-ray spectrum and the β-ray plus γ-ray coincidence spectrum. The part of the singles spectrum that extended above the coincidence spectrum was analyzed to obtain the ratio of feeding to ^{17}O*(870) relative to feeding to the $^{17}O_{g.s.}$=(1.7 *4*):1.0.

Lastly, the beta spectrum was analyzed to determine the feeding β-ray intensity to ^{17}O*(0,870,3055) relative to the total β-ray intensity. These decay branches correspond to (4.66 *75*)% of all decays.

Hence the calculated branching fractions are (1.55 *47*)% to $^{17}O_{g.s.}$, (2.64 *47*)% to ^{17}O*(870), (0.460 *11*)% to ^{17}O*(3055). Furthermore, the lack of feeding to ^{17}O*(3843:J^π=5/2$^-$) is evidence for assigning J^π=1/2$^-$ to $^{17}N_{g.s.}$.

1973De32: ^{17}N ions were produced by bombarding 88% enriched ^{14}C target which was on a thick tungsten backing with 27-MeV α-particles. The neutrons were detected with a ^{3}He filled proportional counter. Three neutron groups at E_n=390 *16*, 1190 *30* and 1710 *40* keV emitted from ^{17}O*(4.55,5.09,5.94 MeV) to $^{16}O_{g.s.}$ with branching ratios of 27% *3*, 57% *4* and 11% *2*, respectively. Relative neutron branching ratios are measured, which are normalized to the accepted %β-n rate of 95%. From the neutron counts in the 1.9-2.6 MeV region an upper limit, <0.4%, is set for the branches emitted from ^{17}O*(6.1-6.8 MeV) to $^{16}O_{g.s.}$.

1973Po11: ^{17}N β^--decay activity was produced by bombarding enriched $^{15}N_2$ gas (95-99% ^{15}N) using a 2.9-MeV triton beam. The beam was chopped and had 4 second activation and counting periods. The β activity was detected by a NE102 detector, the γ-decay activity was detected via a 15.2 cm by 12.7 cm NaI detector. The neutron activity was initially measured using a NE102 disk, though issues with high backgrounds at low-energies led to additional measurements using a ^{3}He proportional counter. The β-n and β-γ coincidences were measured; there is no mention of n-γ coincidences, therefore neutron decays are assumed to populate $^{16}O_{g.s.}$.

Neutron peaks at 385 *4*, 1163 *14* and 1675 *24* keV were observed corresponding to decays from ^{17}O*(4.55,5.38,5.94 MeV) to $^{16}O_{g.s.}$, respectively. The relative ratios for decay branches were determined, and then the absolute branching ratios were determined by a self-consistent renormalization. The feeding to the $^{17}O_{g.s.}$ relative to ^{17}O*(870) was taken from (1964Si06) (=(1.7 *4*):1.0); other ratios, relative to the E_n=1.16 MeV group intensity, were determined. The absolute branching ratios were determined as Branching=(1.7 *5*)% to $^{17}O_{g.s.}$, (2.9 *5*)% to ^{17}O*(870), (0.54 *8*)% to ^{17}O*(3060), (37.9% *18*) to ^{17}O*(4550), (51.1% *15*) to ^{17}O*(5380), and (5.8% *6*) to ^{17}O*(5940). The total feeding to bound ^{17}O levels was found to be (5.14 *72*)%.

1976Al02: ^{17}N ions were produced in the ^{15}N(t,p) reaction by bombarding a Ti^{15}N target with 3.0-MeV tritons. The target was irradiated for 4 sec, followed by a 4 sec counting period.

The γ-ray activity was measured using a Ge(Li) detector. Energies for the ^{17}O first and second excited states were determined as 870.8 keV *2* and 3055.2 keV *3*, and the ratio of the γ ray intensities was measured as 1:(9.6 *4*). This ratio is significanly different from prior results and is attributed to the ability to resolve the E_γ=2190 keV transition from the E_γ=2223 keV peak from thermal neutron capture on hydrogen. No attempt to measure the ground-state branch was made, and hence the values for branching to $^{17}O_{g.s.}$ and ^{17}O bound levels was taken from (1964Si06). The branching ratios were found as (1.6 *5*)% to $^{17}O_{g.s.}$, (3.0 *5*)% to ^{17}O*(870), (0.34 *6*)% to ^{17}O*(3055).

Delayed neutrons were measured using a ^{3}He neutron detector; peaks at E_n=390, 1160 and 1690 keV were observed. Taking the sum of β branches to neutron-stable level in ^{17}O as (4.9 *7*)%, the branching ratios from ^{17}O*(4.55,5.38,5.94 MeV) to $^{16}O_{g.s.}$ are found as 39.2% *20*, 48.0% *15* and 7.9% *7*, respectively.

^{17}N β^- decay (continued)

1976Oh05: ^{17}N β-decay activity was produced via the ^{6}Li(n,α)^{3}H and ^{18}O(^{3}H,α)^{17}N reactions by placing an enriched $^6Li_2C^{18}O_3$ target ($\geq$ 95% ^{6}Li, 93.4% ^{18}O) in a reactor and utilizing a fast pneumatic tube system to transfer the sample between activation and counting stations. The ^{17}N neutron decay curve was measured with eight ^{3}He proportional counters surrounded by paraffin. Four peaks at E_n=382.8 *9*, 884 *21* (new identified), 1170.9 *8* and 1700.3 *17* keV were measured with Γ=54.8 *4*, 113 *55*, 63.2 *11* and 60.5 *32* keV, respectively. Normalization of the neutron emission probabilities to P_n=95% *1* from (1964Si06), yields the β^-n branching ratios from ^{17}O*(4549.3 *13*,5081 *21*, 5387.1 12, 5949.9 *19* keV) to $^{16}O_{g.s.}$ as, 34.8% *26*, 0.6% *4*, 52.7% *35* and 7.0% *5*, respectively.

In addition, $T_{1/2}$=4.174 s *4* was measured.

1984In01: The neutron spectrum of activated cooling water from the SLAC beam dump was analyzed using a ^{3}He spectrometer. The activity is presumably from the ^{18}O(γ,p)^{17}N reaction. In addition to strong neutron lines at E_n=383, 1170 and 1700 keV a significantly weaker group at E_n=2070 keV is suggested. This group has not been reported in other work.

1991Re02: Spallation products from 800 MeV proton bombardment of a ^{232}Th target were captured by a transport line with a mass-to-charge filter and transferred to the TOFI spectrometer at LAMPF. The beamline was separately tuned to transport a number of different nuclides. The neutrons were detected in a polyethylene moderate ^{3}He counter, and standard techniques were implemented. The β-delayed neutron probabilities were deduced from analysis of the number of implanted ions (per beam pulse) and the rate of β-delayed neutrons detected in the zero-threshold counter. The β-delayed neutron probability P_n=(102.4 *60*)% was deduced.

1996Ra02,2003Mi01: In these experiments, authors observed ^{17}N(β^-n) decay to calibrate the neutron energy and the neutron counters. Neutron peaks at 380, 1170 and 1700 keV were observed. The branching ratios of corresponding emissions from ^{17}O*(4.55,5.38,5.94 MeV) to $^{16}O_{g.s.}$ normalized to 95% *1* are 39.5% *46*, 49.1% *46* and 6.4% *10*, respectively (1996Ra02). A fourth known peak at E_n=880 keV was too weak to be observed.

2000Bu33,2001Gr06: A ^{17}N beam was produced by fragmenting a 77 MeV/A ^{18}O beam on a Be target; ^{17}N was selected by the LISE3 spectrometer. Neutron time-of-flight (tof) and energy spectra were obtained using the TONNERRE array which covered 45% of 4π. The intrinsic efficiency is rather high between 1 and 5 MeV. Neutron groups at E_n=380, 1170 and 1710 keV were observed. Intensities are not analyzed.

Comments:

For the population of bound ^{17}O states, the β-ray energy spectrum analysis of (1964Si06) [Branching(^{17}O*(0,870,3055))$_{total}$=(4.66 *75*) and R=1:(1.7 *4*) for β-decay to $^{17}O_{g.s.}$ vs decay to ^{17}O*(870)] are combined with R=(9.6 *4*):1 for the relative intensities of E_γ=870 and 2170 keV γ-rays from (1976Al02).

The data on decay feedings to bound states in ^{17}O is sparse; measurements are found in (1964Si06,1973Po11,1976Al02). The only complete measurement on the decay populating ^{17}O bound states is found in (1964Si06); along with studying the γ radiations with a NaI detector, they analyzed the β radiations. In (1964Si06) the ratio of the β-decay to $^{17}O_{g.s.}$ relative to feeding of ^{17}O*(870) is determined as 1:(1.7 *4*); there is no other comparible measurement. Further analysis of the β-ray spectrum determined that the bound ^{17}O*(0,870,3055) states are populated in (4.66 *75*)% of decays. In (1973Po11), use of the (1964Si06) ground state result, along with analysis of their NaI data results in finding the branching ratio to ^{17}O*(0,870,3055) as (5.14 *72*)%, but, as mentioned below, it is suggested that the E_γ=2170 keV intensity is enlarged by a systematic error associated with contributions from n+p capture. In (1973Po11) one finds the only reported connection between any neutron group intensity and a γ-ray transition intensity: I($\gamma_{870\ keV}$)/I(E_n=1.16 MeV)=(0.0667 *95*). In (1976Al02) the value R=(9.6 *4*):1 for the relative intensities of E_γ=870 and 2170 keV γ-rays is found; they suggest the results of (1964Si06,1973Po11) are unreliable because neither group could resolve n+p capture γ rays from the 2170 keV decay transition; in spite of great caution described in those works this uncertainty discounts their E_γ=2170 keV intensities.

In all cases, the neutron group branching ratios are based on relative intensity measurements that are normalized to unity with inclusion of feedings to ^{17}O bound states.

There are discrepancies among the relative intensities reported in (1973De32,1973Po11,1976Al02,1976Oh05,1996Ra02). In the present analysis all measurements are considered; the results of (1973De32) appear to deviate significantly from other measurements and are excluded from analysis. The mean intensities from the remaining four measurements are determined after normalizing each measurement to the strongest decay transition. These intensities are then renormalized to yield %β-n=(100−(4.66 *75*))=(95.34 *75*)%.

^{17}O State: present (%) for major branches.

0: 1.61 *50*.

871: 2.73 *56* (γ-ray intensity=(3.05 *56*)%).

$^{17}N\ \beta^-$ decay (continued)

3055: 0.32 *6*.
4554: 37.8 *11*.
5085: 0.57 *38*.
5379: 50.31 *99*.
5939: 6.69 *31*.
It is noted that the ratio $I(\gamma_{870\ keV})/I(E_n=1.16\ MeV)=(0.0667\ 95)$ from (1973Po11) is not well met in the present findings. This perhaps suggests new data on the feedings to bound states would be enlightening.

1948Kn24: $^{17}N(\beta^-n)$; measured decay products, E_n, I_n; deduced $T_{1/2}$.
1949Al04: $^{17}N(\beta^-n)$; The decay scheme of a 4.2-second neutron emitter has been investigated.
1949Ha55: $^{17}N(\beta^-n)$; measured decay products, E_n, I_n; deduced neutron energy distribution, an excited state width in ^{17}O.
1961Hi01: $^{17}N(\beta^-n)$; deduced nuclear properties.
1961Pe28: $^{17}N(\beta^-n)$; measured decay products, E_n, I_n; deduced energies of delayed neutrons, ^{17}N ground state J, π.
1963Gi04: $^{17}N(\beta^-n)$; deduced nuclear properties.
1965Do13: ^{17}N; measured $T_{1/2}$.
1970Me31: $^{17}N(\beta^-n)$; measured $T_{1/2}$.
1972Al42: ^{17}N; measured $T_{1/2}$.
1976Fi03: ^{17}N; measured $T_{1/2}$, delayed γ, delayed neutrons.
1977Fr19: ^{17}N; measured delayed neutron spectra.
1983Ra29: > transition rates. The asymmetry for the corresponding isovector E1 transitions in ^{17}O and ^{17}F is found to be, comparable in magnitude with the asymmetry for the analogous $\beta^{\mp}$ decays of ^{17}N and ^{17}Ne.
1993Bu21: $^{17}N(\beta^-)$; measured β-delayed E_α, I_α; deduced $^{12}C(\alpha,\alpha)$ reaction p-wave capture amplitude.
1994Do08: $^{17}N(\beta^-)$; measured β-delayed E_α, I_α, $\alpha(^{13}C)$-coin; deduced log *ft*, total $\beta\alpha$-branching ratio. ^{17}O deduced levels contributing to α-decay.
1996Ue02,1996UeZZ: $^{17}N(\beta^-)$; measured NMR; deduced μ.
2008RiZX: $^{17}N(\beta^-)$; measured β-delayed neutron decay.
2013Ue01: $^{17}N(\beta)$,(β^-n); measured E_γ, I_γ, E_β, I_β, E(n) by tof, I(n), β-NMR, $\beta\gamma$-, $\beta\gamma\gamma$-, $\beta n\gamma$-coin.
See also (2002Mi17: theory).

Theory:
1970Be21: $^{17}N(\beta^-)$; calculated hindrance in nuclear matrix elements for unique first-forbidden transitions.
1970Hi15: $^{17}N(\beta^-)$; calculated log *ft*.
1971To08: ^{17}N; analyzed 1st-forbidden unique β-decay data; deduced f_1t, β-moments.
1972To03: $^{17}N(\beta^-)$; calculated nuclear matrix elements, shape factors, longitudinal polarisations for first-forbidden, non-unique β-transitions.
1992He12: $^{17}N(\beta^-)$; calculated square root of branching ratio for decay to final levels; deduced enhancements due to level mixing caused by T-odd forces.
1997Mi08: $^{17}N(\beta^-)$; analyzed β-decay rates via f values; deduced charge-dependent effects role. Shell model.

^{17}O Levels

E(level)†	J^π†	Γ†	E(level)†	J^π†	Γ†
0	$5/2^+$		5732.04 *40*	$(5/2^-)$	<1 keV
870.756 *20*	$1/2^+$	179.6 ps *27*	5869.62 *40*	$3/2^+$	6.6 keV *7*
3055.40 *6*	$1/2^-$	110 fs *+24−21*	5931.5 *18*	$1/2^-$	32 keV *3*
3842.8 *4*	$5/2^-$	92×10^{-3} eV *6*	6362.3 *29*	$1/2^+$	126 keV *14*
4551.7 *7*	$3/2^-$	38.7 keV *28*	7542 *20*	$3/2^-$	500 keV *50*
5086.8 *9*	$3/2^+$	90 keV *3*	7.99×10^3 *5*	$1/2^-$	270 keV *27*
5387.0 *22*	$3/2^-$	37.1 keV *24*	8200 *8*	$3/2^-$	61 keV *10*

† From Adopted Levels.

^{17}N β^- decay (continued)

β^- radiations

E(decay)	E(level)	$I\beta^{-}$@	Log *ft*	Comments
(479 *17*)	8200	0.013† *3*	4.04 *12*	av Eβ=168.5 *68* Iβ^-: from (1994Do08). $\beta^-\alpha$ braching=(9.8×10^{-4} *20*)% (1994Do08). Γ_α/Γ=0.077 *8* (1973Fo11,1973Jo01).
(6.9×10^2 *5*)	7990	0.026† *6*	4.32 *17*	av Eβ=253 *22* Iβ^-: from (1994Do08). $\beta^-\alpha$ braching=(1.5×10^{-3} *3*)% (1994Do08). Γ_α/Γ=0.059 *7* (1973Fo11,1973Jo01).
(1137 *25*)	7542	<0.35†	>4.0	av Eβ=445 *11* Iβ^-: from (1994Do08). $\beta^-\alpha$ braching<6.9×10^{-5}% (1994Do08). Γ_α/Γ=0.0002 (1973Fo11,1973Jo01).
(2317 *15*)	6362.3	<0.08	>6.0	av Eβ=989.8 *79* Iβ^-: from (1976Oh05). See also (1973De32: I$\beta^-\leq$0.4% for E_x=6.1-6.8 MeV).
(2748 *15*)	5931.5	6.69# *31*	4.380 *23*	av Eβ=1194.6 *73* Iβ^-: Literature values are (1973De32: 11% *2*), (1973Po11: 5.8% *6*), (1976Al02: 7.9% *7*), (1976Oh05: 7.0% *5*), (1996Ra02: 6.4% *10*).
(2809 *15*)	5869.62	<0.15	>6.1	av Eβ=1224.3 *72* Iβ^-: from (1976Oh05).
(2947 *15*)	5732.04	<0.23	>6.0	av Eβ=1290.3 *73* Iβ^-: from (1976Oh05).
(3292 *15*)	5387.0	50.31# *99*	3.851 *13*	av Eβ=1456.6 *74* Iβ^-: Literature values are (1973De32: 57% *4*), (1973Po11: 51.1% *15*), (1976Al02: 48.0% *15*), (1976Oh05: 52.7% *35*), (1996Ra02: 49.1% *46*).
(3592 *15*)	5086.8	0.57# *38*	6.0 *3*	av Eβ=1602.1 *73* Iβ^-: from normalized analysis of (1976Oh05: 0.6% *4*).
(4127 *15*)	4551.7	37.8# *11*	4.416 *15*	av Eβ=1862.5 *74* Iβ^-: Literature values are (1973De32: 27% *3*), (1973Po11: 37.9% *18*), (1976Al02: 39.2% *20*), (1976Oh05: 34.8% *26*), (1996Ra02: 39.5% *46*).
(4836 *15*)	3842.8	<7×10^{-3}	>8.5	av Eβ=2209.4 *74* Iβ^-: from (1976Al02). See also <0.1% (1964Si06).
(5624 *15*)	3055.40	0.32‡ *6*	7.10 *9*	av Eβ=2597.1 *74* Iβ^-: See also (1964Si06: 0.460% *11*), (1973Po11: 0.54% *8*), (1976Al02: 0.34% *6*).
(7808 *15*)	870.756	2.73‡ *56*	6.84 *9*	av Eβ=3674.9 *75* Iβ^-: See also (1964Si06: 2.64% *47*), (1973Po11: 2.9% *5*), (1976Al02: 3.0% *5*).
(8679 *15*)	0	1.61‡ *50*	9.55^{1u} *14*	av Eβ=4117.7 *75* Iβ^-: See alo (1964Si06: 1.55% *47*), (1973Po11: 1.7% *5*).

† Neutrons from these weakly populated states are not independtly observed (1994Do08).

‡ Branching ratios decaying to ^{17}O*(g.s.,0.87,3.06) states are calculated using the ratio of Iβ^-(g.s.)/Iβ^-(0.87)=1:(1.7 *4*) (1964Si06) combined with the ratio of $I_{\gamma=870}/I_{\gamma=2170}$=(9.6 *4*):1 (1976Al02) then the bound state intensities are normalized to 4.66% *75* (1964Si06).

Branching ratios for decay to ^{17}O*(4.55,5.08,5.38,5.94) states are deduced by considering values from (1973Po11, 1976Al02, 1976Oh05, 1996Ra02). Observations are normalized to the strongest decay branch, averaged, and then renormalizing to 95.34% *75*. For (1976Al02) we have used Iβ^-(5.94)=7.9% *7* from their Table II rather than 7.9% *3* from their abstract; this choice impacts the deduced branching intensities.

@ Absolute intensity per 100 decays.

^{17}N β^- decay (continued)

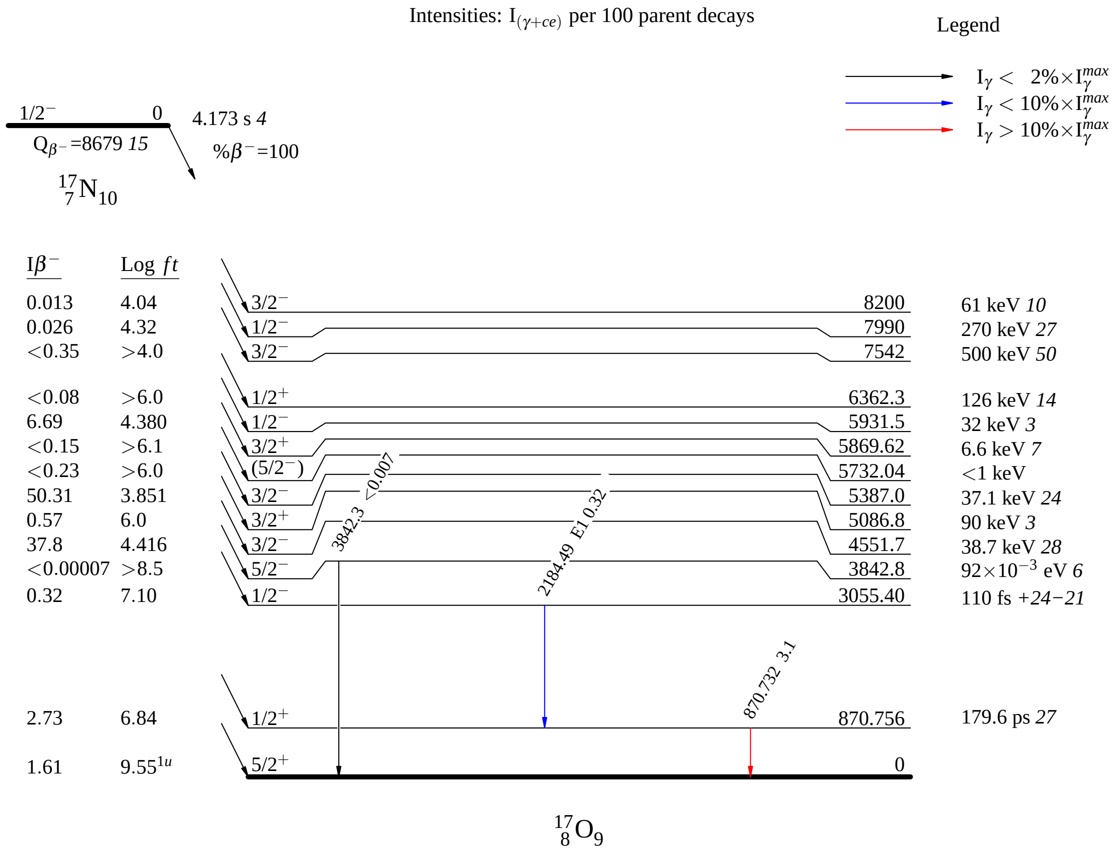
$\gamma(^{17}O)$

E_γ †	I_γ ‡	E_i(level)	J_i^π	E_f	J_f^π	Mult.	Comments
870.732 *20*	3.05 *56*	870.756	1/2+	0	5/2+		I_γ: deduced from $I\beta^-$. See footnote above.
2184.49 *5*	0.32 *6*	3055.40	1/2−	870.756	1/2+	E1	I_γ: deduced from $I\beta^-$. Direct ground state decay is <1.5% (1976Al02).
3842.3 *4*	$<7\times10^{-3}$	3842.8	5/2−	0	5/2+		I_γ: from (1976Al02).

† From Adopted Levels.
‡ Absolute intensity per 100 decays.

^{17}N β^- decay

Decay Scheme



^{17}**F** β^+ **decay** **1969Ga05**

Parent: ^{17}F: E=0; J^π=5/2$^+$; $T_{1/2}$=64.385 s *53*; Q(β^+)=2760.47 *25*; %β^+ decay=100

^{17}F-$T_{1/2}$: Weighted Average (external uncertainty) of (1977Al20: 64.80 s *12*), (1977Az01: 64.31 s *9*), (2015Gr14: 64.347 s *35*) and (2016Br01: 64.402 s *39*). See also (1949Br27, 1954Wo20, 1954Ko54, 1958Ar15, 1960Ja12, 1969Wo09, 1972Al42) for other $T_{1/2}$ values measured and the analysis of half-lives (2008Se10).

^{17}F-Q(β^+): From (2017Wa10).

1949Br27: ^{17}F(β^+); measured $T_{1/2}$.

1954Ko54: ^{17}F(β^+); measured $T_{1/2}$.

1954Wo20: ^{17}F(β^+); measured $T_{1/2}$.

1958Ar15: ^{17}F(β^+); measured $T_{1/2}$.

1960Ja12: ^{17}F; measured not abstracted; deduced nuclear properties.

1969Ga05: ^{17}F β^+-decay was studied by bombarding a 3-MeV deuterons beam a thick target PbO_2 with the Van de Graaff accelerator. A 22-cc Ge(Li) detector was used to measure γ-rays. Four runs were made to search possible 871-keV γ-ray that results from the ^{17}F→^{17}O*(8.57 MeV) decay. The upper limit for this transition is determined as <3.4×10^{-4}, corresponig to log *ft*>5.6.

1969Wo09: ^{17}F(β^+); measured $T_{1/2}$.

1972Al42: ^{17}F(β^+); measured $T_{1/2}$.

1977Al20: ^{17}F(β^+); measured $T_{1/2}$.

1977Az01: ^{17}F(β^+); measured $T_{1/2}$.

1987SeZL,1987SeZR,1988Se11: ^{17}F(β^+); measured β-anisotropy.

1989Se07: ^{17}F(β^+); measured $\beta(\theta)$, oriented nuclei.

1990FuZQ,1991MaZL,1992Mi13,1993Mi33: ^{17}F(β^+); measured β-NMR spectra asymmetry change in NaF; deduced μ.

2000Se23: ^{17}F(β^+); measured polarization asymmetry correlation.

2007Zh03: ^{17}F(β^+),(ε); measured β-NMR spectra from polarized source. ^{17}F deduced quadrupole moment.

2015Gr14: ^{17}F(β^+),(ε); measured E_β, I_β, E_γ, half-lives of the ground states; deduced *ft*.

2016Br01: ^{17}F(β^+); measured β radiation, half-life.

See also (2015To02, 2012Sa50: theory).

^{17}O Levels

E(level)	J^π	$T_{1/2}$
0	5/2$^+$	
870.756 *20*	1/2$^+$	179.6 ps *27*

ε,β^+ radiations

E(decay)	E(level)	Iβ^+†‡	Iε‡	Log *ft*	I($\varepsilon+\beta^+$)‡	Comments
(1889.7 *3*)	870.756	<0.034	<0.00042	>5.6	<3.4×10^{-2}	av Eβ=349.16 *11*; εK=0.01156 *1*; εL=0.0006887 *7*
(2760.47 *25*)	0	99.8544 *15*	0.1456 *15*	3.3562 *5*	100	av Eβ=739.46 *12*; εK=0.0013744 *6*; εL=8.184×10^{-5} *4*

† From (1969Ga05).

‡ Absolute intensity per 100 decays.

^{18}N β^{-}n decay 1994Sc01,2005Li60,2007Lo05

Parent: ^{18}N: E=0; J^{π}=1^{-}; $T_{1/2}$=619 ms *2*; Q(β^{-}n)=5851 *19*; %β^{-}n decay=12.0 *13*

^{18}N-$T_{1/2}$: from (2005Li60), see also $T_{1/2}$=624 ms *12* (1982Ol01) and 620 ms *8* (2007Bu01).

^{18}N-Q(β^{-}n): from (2021Wa16).

1991Re02: Spallation products from 800 MeV proton bombardment of a ^{232}Th target were captured by a transport line with a mass-to-charge filter and transfered to the TOFI spectrometer at LAMPF. The beam line was separately tuned to transport a number of different nuclides. The ions were implanted in a Si detector, and identification by standard techniques was implemented. The β-delayed neutrons were detected in a polyethylene moderated ^{3}He counter; half-lives and β-delayed neutron probabilities were deduced from analysis of the number of implanted ions (per beam pulse) and the rate of β-delayed neutrons detected in the zero-threshold counter. The β-delayed neutron probability =14.3% *20* was deduced along with $T_{1/2}$=790 ms *210*.

A reanalysis of the 1991Re02 data, with additional data was published in (1994ReZZ). The reanalysis indicates P_n=(12.0 *13*)% and $T_{1/2}$=658 ms *44*. (Other unpublished reanalyses are found in 1995ReZZ, 2008ReZZ).

1993ReZX: ^{18}N(β^{-}n); measured β-delayed neutron average energies. Ring ratio technique.

1994Sc01: A Be target was bombarded by a 75 MeV/A ^{22}Ne beam to produce ^{18}N ions that were selected and stopped in a thin plastic detector. The implantation detector was surrounded by 15 large area neutron detectors that covered 14.3% of 4π, and neutron energies were determined by time-of-flight between the implantation foil and the neutron array.

The lifetime $T_{1/2}$=624 ms *12* was measured. Nine neutron groups with energies (branching ratios) of E_n=0.99 MeV *3* (0.16 *3*)%, 1.16 MeV *2* (0.39 *9*)%, 1.35 MeV *2* (0.47 *9*)%, 1.55 MeV *2* (0.14 *3*)%, 1.77 MeV *2* (0.17 *3*)%, 2.07 MeV *3* (0.16 *3*)%, 2.46 MeV *3* (0.43 *9*)%, 2.78 MeV *3* (0.13 *3*)% and 3.26 MeV *3* (0.19 *4*)% were observed in the ToF spectrum. The total observed branching ratio (Branching) to neutron unbound levels is 2.2% *4*.

2005Li60: A thick Be target was bombarded by a 68.8 MeV/A ^{22}Ne beam to produce ^{18}N ions that were selected and stopped in a thin plastic scintillation detector. Two different plastic scintillator arrays (neutron walls) were used to detect delayed neutrons with coverage of 30% and 2.2% of 4π sr for high energy and low energy, respectively. The neutron detection efficiecies were calibrated with the known ^{17}N β^{-}n decay neutron spectrum. A set of 3 HPGe detectors were positioned around the target to measure γ-ray emissions.

Beam was collected in the target for cycles of 2.0 s activation periods followed by 2.0 s counting periods. The result $T_{1/2}$=619 ms *2* was obtained from analysis of the β-ray decay curve observed in the thin plastic catcher foil; a small 5% ^{20}O ($T_{1/2}$=13.5 s) component was the main active beam contaminant. An exclusive gate on the on the strongest neutron peak at E_n= 0.58 MeV yielded the value $T_{1/2}$=610 ms *23*.

Analysis of the ToF spectrum indicates decays of 11 neutron emitting states in ^{18}O with E_n (branching ratio)=0.58 MeV *2* (5.04 *112*)%, 0.79 MeV *4* (0.28 *6*)%, 0.97 MeV *2* (0.11 *3*)%, 1.16 MeV *3* (0.18 *3*)%, 1.35 MeV *3* (0.24 *4*)%, 1.48 MeV *3* (0.05 *2*)%, 1.72 MeV *3* (0.18 *3*)%, 1.98 MeV *4* (0.11 *3*)%, 2.44 MeV *4* (0.43 *6*)%, 2.70 MeV *4* (0.13 *2*)% and 3.22 MeV *5* (0.23 *3*)%. The total observed Branching is 6.98% *146*. The β-delayed γ-ray emissions were briefly discussed, though there is no mention of any transitions observed in ^{17}O; it is assumed that none are observed.

2007Lo05: A Be target was bombarded by a 68.8 MeV/A ^{22}Ne beam to produce ^{18}N ions that were selected and stopped in a thin plastic scintillation detector. A neutron sphere composed of eight identical plastic scintillator counters was used to detect delayed neutrons; each segment covered 3.75% of 4π sr.

Three $T_{1/2}$ values were obtained by gating the β-time spectrum corresponding to various neutron peaks, 625 ms *30*, 635 ms *40* and 609 ms *60*. In this measurement, the emphasis was on fast neutrons. Nine neutron peaks were observed, eight are in good agreement with 2005Li60. Peaks are observed at E_n=1.13 MeV *3*, 1.35 MeV *3*, 1.58 MeV *3*, 1.79 MeV *3*, 2.05 MeV *3*, 2.43 MeV *4*, 2.76 MeV *4*, 3.22 MeV *4* and 3.78 MeV *5* (0.05 *3*)%. A new peak at E_n(lab)=3.78 MeV *5* was identified. The detection efficiency for groups with E_n < 2.0 MeV was low, and therefore the proceedure for fitting of these peaks relied on prior analysis. The total observed β-delayed Branching is 7.03% *146*.

In this experiment, the calibration using ^{17}N provided the neutron detection efficiency up to 1.73 MeV, the authors used the efficiency curve obtained in 2005Li60 (efficiency up to 3.22 MeV) to determine the absolute Branching of this new peak. The Branching of 0.05% *3* corresponding to E_x(^{18}O)=12.05 MeV *5* and log *ft*=5.24 *3* was deduced. This new state was also observed by 1995Se02 in an electron scattering experiment, who found the J^{π}=1^{-} or 2^{+}. The present authors concluded J^{π}=1^{-}.

Comments:

P_n=12.0% *13* is reported in the reanalysis of 1991Re02. Results reported in (2005Li60, 2007Lo05) can account for only (7.03 *146*)%; the missing strength of ≈5% is attributed to one or several states in ^{18}O with 8.044 MeV ≤E_x≤8.50 MeV, where the corresponding neutron group's emission energy is below the threshold of the neutron detector systems.

No evidence was found for population of a broad state at E_x≈9 MeV (suggested by 1989Zh04 in β-delayed α-emission); In 1994Sc01 an upper limit for its Branching of ≤1% was deduced from the total number of counts in the relevant energy range.

^{18}N β^-n decay 1994Sc01,2005Li60,2007Lo05 (continued)

Comparing with 1989Zh04, it can be concluded that most of the observed width corresponds to the Γ_α of this state.

In 1994Sc01, neutron groups with a total Branching of 2.2% *4* were observed; a comparison with those same groups observed in 2005Li60 yields a slightly lower Branching of 1.66% *28*. The analysis of 2005Li60, which finds a total %β^-n intensity of (7.0 *15*)%, may be limited by an insensitivity to low energy neutrons. In addition 2007Lo05 taylored their sensitivity to fast neutron groups, which were difficult to resolve, and a new transition in the β-delayed neutron decay is observed. No neutron peaks between 3.78 and 5.5 MeV were observed.

See also (1993ShZW).

^{17}O Levels

E(level)†	J$^{\pi}$†
0.0	5/2$^+$

† From Adopted Levels.

Delayed Neutrons (^{17}O)

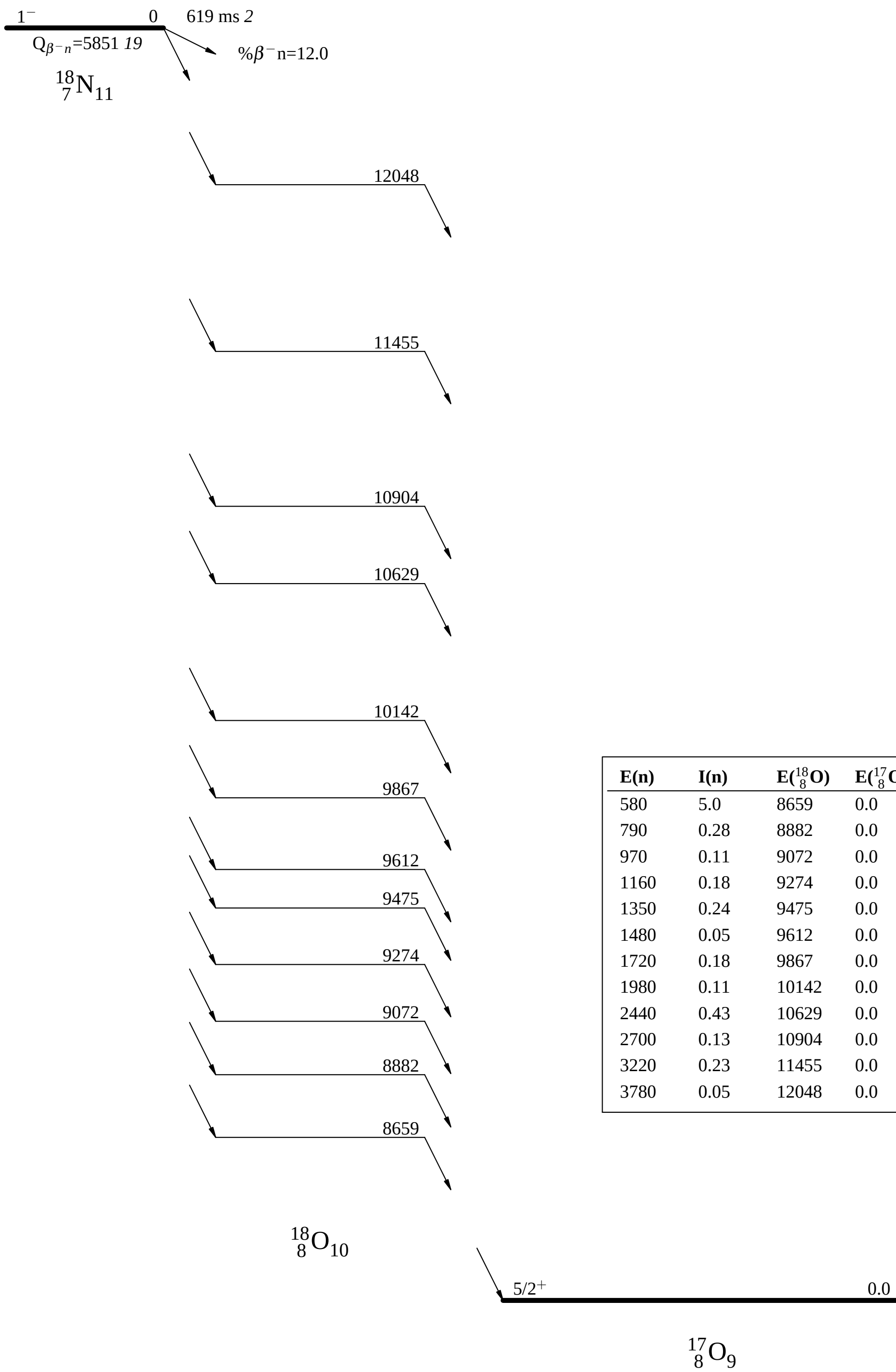
E(n)†	E(^{17}O)	I(n)†‡	E(^{18}O)	Comments
580 *20*	0.0	5.0 *11*	8659	I(n)=(5.04 *112*)%.
790 *40*	0.0	0.28 *6*	8882	
970 *20*	0.0	0.11 *3*	9072	
1160 *30*	0.0	0.18 *3*	9274	
1350 *30*	0.0	0.24 *4*	9475	
1480 *30*	0.0	0.05 *2*	9612	
1720 *30*	0.0	0.18 *2*	9867	
1980 *40*	0.0	0.11 *3*	10142	
2440 *40*	0.0	0.43 *6*	10629	
2700 *40*	0.0	0.13 *2*	10904	
3220 *50*	0.0	0.23 *3*	11455	
3780 *50*	0.0	0.05 *3*	12048	E(n),I(n): from (2007Lo05).

† From (2005Li60) except where noted.
‡ Absolute intensity per 100 decays.

$^{18}N\ \beta^{-}n$ decay 1994Sc01,2005Li60,2007Lo05

Decay Scheme

I(n) Intensities: I(n) per 100 parent decays



E(n)	I(n)	E($^{18}_{8}O$)	E($^{17}_{8}O$)
580	5.0	8659	0.0
790	0.28	8882	0.0
970	0.11	9072	0.0
1160	0.18	9274	0.0
1350	0.24	9475	0.0
1480	0.05	9612	0.0
1720	0.18	9867	0.0
1980	0.11	10142	0.0
2440	0.43	10629	0.0
2700	0.13	10904	0.0
3220	0.23	11455	0.0
3780	0.05	12048	0.0

$^{2}H(^{16}O,p)$ **2013Al14**

1980FlZU: $^{2}H(^{16}O,p)$, E=42 MeV; measured $\sigma(E_p)$. ^{17}O levels deduced ^{16}O-neutron final state interaction. Kinematically complete experiment, Si(Sb) detector, tof, deuterated polyethylene target.

2013Al14: XUNDL dataset compilded by TUNL, 2013.

The authors verified the performance of an experimental configuration using the $^{2}H(^{16}O,p)^{17}O$ reaction to study the (d,p) reaction in inverse kinematics. The primary focus was on $^{2}H(^{8}He,p)$ to study ^{9}He levels.

A beam of $E(^{16}O)$=15.5 MeV/A ions from accelerators at GANIL impinged on Cd_2 targets of thickness 320 or 550 $\mu g/cm^2$. Position sensitive gas chamber detectors measured the incident trajectories while recoiling protons were measured at backward angles (θ=120°−170°) by a set of four position sensitive ΔE-ΔE-E MUST2 detector telescopes. In addition, the ^{17}O ejectiles (or ^{16}O ejectiles from in flight decay of neutron unbound levels of ^{17}O) were detected by a thick plastic scintillator at $\theta < 5.6°$ along with non-interacting beam particles. The missing mass spectrum, which was deduced from the incident beam-particle kinematics and the ejected proton, revealed the ^{17}O states populated in the reaction. The spectrum was analyzed via DWBA analysis and compared with literature values.

See also (1980FlZU).

^{17}O Levels

E(level)‡	J^{π}†	Γ‡	L‡	C^2S‡#	Comments
0	5/2+			0.7 *2*	E(level): The authors deduced a ^{17}O mass excess that differs by 5 keV *2* when compared with (2017Wa10); this implies an unaccountable systematic error.
865 *9*	1/2+		0	1.4 *3*	
5089 *1*	3/2+	≈70 keV		0.8 *2*	
5692 *7*	7/2−			0.13 *3*	
≈7550					

† Nominal values listed in (2013Al14).
‡ From (2013Al14).
# Uncertainties are stated as 20% by (2013Al14).

^{6}Li(^{13}C,d) 2015Av02

1987Ca30: ^{6}Li(^{13}C,d)^{17}O*→α+^{13}C, E=34 MeV; measured $\sigma(\theta_d,\theta_\alpha)$; deduced reaction mechanism. ^{17}O deduced levels,

2006Jo11: A beam of E(^{13}C)=8.0, 8.5 MeV impinged on a 50 μg/cm^{2} thick, 98% enriched ^{6}Li target at the Florida State University Tandem-LINAC facility. Four Si ΔE-E telescopes were used to identify deuterons at forward angles with thicknesses from 15 to 25 μm. The energy resolution FWHM in the c.m. system was ≈250 keV. The code FRESCO was used to calculate the reaction angular distribution in the DWBA approach. The low-energy astrophysical S-factor was determined using the indirect asymptotic normalization (ANC) technique. Coulomb-modified ANC^{2} for ^{13}C+α→^{17}O*(6.356 MeV:1/2^{+})=0.89 fm^{-1} *23* and the S(0) of this ^{17}O state is (2.5±0.7)×10^{6} MeV·b.

2015Av02: XUNDL dataset compiled by TUNL, 2015.

An 8 MeV beam of ^{13}C ions, from the John D. Fox Accelerator Lab at FSU, impinged on 35 μg/cm^{2} (±10%) ^{6}Li targets. The reaction products were detected using a pair of ΔE-E (position sensitive proportional counter/Si pin diode) detectors. The effective energy, corresponding to the energy where half the yield has been produced, was determined as 7.72 MeV. Many states, including an unresolved multiplet of states near 5.9 MeV were populated in the reaction.

The authors deduced the ^{17}O*(6356) asymptotic normalization coefficient (ANC) and analyzed its impact on the ^{13}C(α,n)^{16}O reaction rate at astrophysical energies. This reaction is thought to be the main source of *s*-process neutrons, and existing information in the literature provides an inconsistent description. The value ANC^{2}=3.6 fm^{-1} *7* was deduced. See also (2018Ke03: theory).

^{17}O Levels

E(level)[†]	J$^{\pi}$[†]	Comments
0		
871		
3055		
3843		
4552		
5085[‡]		
5216[‡]		
5379[‡]		
5700[#]		
5730[#]		
5870[#]		
5940[#]		
6356		ANC^{2}=3.6 fm^{-1} *7* is deduced by (2015Av02). See also ANC^{2}=0.89 fm^{-1} *23* (2006Jo11).
13.6×10^{3}	(11/2,13/2)	E(level),J$^{\pi}$: Analysis of the angular distributions in (1987Ca30) concluded this peak corresponds to an unresolved doublet with (11/2,13/2).
16.1×10^{3}	(7/2,11/2)	E(level),J$^{\pi}$: Analysis of the angular distributions in (1987Ca30) concluded this peak corresponds to an unresolved doublet with (7/2,11/2).

† Nominal values listed in (2015Av02) except where noted.

‡ Unresolved group of levels includes ^{17}O*(5085,5216,5379) (2015Av02).

Unresolved group of levels includes ^{17}O*(5700,5730,5870,5940) (2015Av02).

^{6}Li(^{18}O,^{17}O) 2014Ru06

2014Ru06: XUNDL dataset compiled by TUNL, 2014.

A beam of 114 MeV ^{18}O ions, from the Warsaw cyclotron facility, impinged on a ≈900 μg/cm^2 85% enriched ^{6}Li target. The reaction products were detected using a set of three ΔE-E telescopes that were positioned with an accuracy of about 0.3°. Population of ^{7}Li*(0,0.48,4.65,6.60,7.45 MeV) and ^{17}O*(0,0.87,3.06,3.84,5.08,5.38 MeV) were observed in the energy spectra for one-neutron transfer reactions. The ^{6}Li+^{18}O elastic and inelastic scattering was measured simultaneously (2014Ru01).

The data were analyzed using the coupled-reaction-channels (CRC) method using optical model potentials in the entrance and exit channels. The ^{7}Li+^{17}O optical potential is deduced and compared with those deduced from analysis of ^{6,7}Li+^{18}O and ^{6}Li+^{16}O scatterings.

See also (2015Ru04: theory).

^{17}O Levels

E(level)†	J^{π}†
0	5/2$^+$
871	1/2$^+$
3055	1/2$^-$
3841	5/2$^-$
4553	
5086	
5380	

† Reported in (2014Ru06).

^{7}Li(^{18}O,^{17}O) 2009Ru13

2009Ru13: XUNDL dataset compiled by TUNL, 2010.

The authors measured angular distributions of ^{17}O ions from ^{7}Li(^{18}O,^{17}O)^{8}Li at E(^{18}O)=114 MeV. Transitions to the ground and excited states of ^{17}O and ^{8}Li are observed. The angular distributions are evaluated in DWBA and Coupled-Reaction-Channels analyses. Optical model potentials are deduced.

^{17}O Levels

E(level)†	J^π†
0	5/2$^+$
871	1/2$^+$
3055	1/2$^-$
3841	5/2$^-$
4553	3/2$^-$
5380	3/2$^-$

† Reported in (2009Ru13).

^{9}Be(^{16}O,^{17}O),^{16}O(^{9}Be,^{17}O) 1977St20

1969BaZN: ^{9}Be(^{16}O,^{17}O),^{13}C(^{16}O,^{17}O), E=15-20 MeV; measured $\sigma(\theta)$.
1969Ni09: ^{9}Be(^{16}O,^{17}O), E=15 MeV; measured Doppler-shift attenuation, plunger method. ^{17}O deduced $T_{1/2}$ (level). Enriched targets.
1970Ba49: ^{9}Be(^{16}O,^{17}O), E=11,15,18 MeV; ^{13}C(^{16}O,^{17}O), E=14,17,20 MeV; measured $\sigma(\theta)$. ^{17}O deduced neutron S.
1970Ba55: ^{9}Be(^{16}O,^{17}O), E=7-21 MeV; ^{13}C(^{16}O,^{17}O), E=12-22 MeV; measured $\sigma(E; E_\gamma)$. ^{17}O level deduced S.
1971Ba68: ^{9}Be(^{16}O,^{17}O), E=11,15,19,7-13 MeV; ^{13}C(^{16}O,^{17}O), E=12-16,17,20 MeV; measured σ(E); deduced S(n) products.
1971Ni04: ^{9}Be(^{16}O,^{17}O), E=6-19 MeV; measured $\sigma(E; E_\gamma)$.
1977St20: ^{16}O(^{9}Be,^{8}Be), E=50 MeV; measured $\sigma(\theta)$. ^{17}O levels deduced relative, absolute S.
1977Sw05: ^{16}O(^{9}Be,^{8}Be), E=5-14.5 MeV; measured γ-yields; deduced n-transfer, fusion σ(E). Optical model, incoming wave analysis. Ge(Li) detector sub-barrier energies.
1979Ch12: ^{9}Be(^{16}O,^{17}O), E=9-12,12.25-20 MeV; measured E_γ, I_γ, particle γ-coin, $\gamma\gamma$-coin. ^{17}O deduced γ-transitions, production σ.
1988Ja14: ^{16}O(^{9}Be,^{8}Be), E(cm)=10.3, 12.8 MeV; measured $\sigma(\theta)$. Deduced reaction mechanism, cluster transfer estimates.
1988We17: ^{9}Be(^{16}O,^{17}O), E(cm)=7.2,8.4,9,9.6,10.2 MeV; measured $\sigma(\theta)$, low-lying states; deduced molecular effects existence. Second-order exact finite-range DWBA calculations.
2004ScZX: ^{9}Be(^{16}O,^{17}O), E=2.3 MeV/nucleon; measured $\sigma(E,\theta)$. Comparison with DWBA predictions.

Theory:
1973Ba51: ^{9}Be(^{16}O,^{17}O); calculated $\sigma(\theta)$.
1986Kw03: ^{9}Be(^{16}O,^{17}O), E not given; analyzed transfer reaction data; deduced intermediate nuclear state quantum number in α-transfer. A=9-15; calculated levels, α-spectroscopic amplitudes; deduced α-particle transfer sum rule. Core plus α-particle model.

^{17}O Levels

Notes: Most experiments here populated ^{17}O*(0,871) states.
Γ: From (1969Ni09).

E(level)†	J^π†	τ_m	S‡	Comments
0	5/2$^+$		0.76	
870	1/2$^+$	253 ps *6*	0.89	The Q(β^-)value for neutron transfer to this state is 1.61 MeV (1977Sw05).
3840	5/2$^-$			E(level): weakly populated.
5080	3/2$^+$			
5700	7/2$^-$			
7600	3/2$^-$			

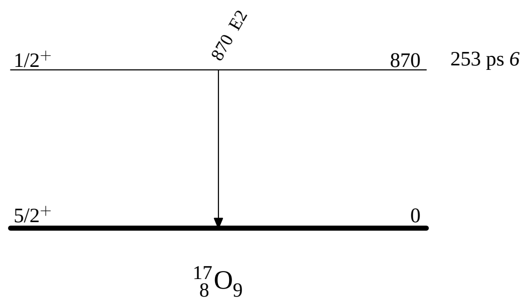
† Populated in (1977St20) from known levels (1977Aj02).
‡ Neutron S-factors (1970Ba49).

γ(^{17}O)

E_γ	E_i(level)	J^π_i	E_f	J^π_f	Mult.	Comments
870	870	1/2$^+$	0	5/2$^+$	E2	E_γ: (1977Sw05,1979Ch12). B(E2)(W.u.)=2.4 (1969Ni09). See also (1979Ch12).

$^{9}Be(^{16}O,^{17}O),^{16}O(^{9}Be,^{17}O)$ 1977St20

Level Scheme



^{9}Be(^{13}C,α^{13}C) 2009Mi23

2009Mi23: XUNDL dataset compiled by TUNL, 2009.

The authors used resonant particle spectroscopy to analyze the center of mass energy spectrum of ^{13}C + α particles detected following ^{9}Be(^{13}C,^{13}C+X) reactions at E(^{13}C)=90 MeV. The ^{13}C ions were measured in a position sensitive ΔE-E telescope, while the α-particles were detected in an array of position sensitive ΔE detectors; α-particles are the only stable particles that can be in coincidence with ^{13}C. The ^{13}C ground state and ^{13}C*(≈3.7 MeV) participate in the reaction.

^{17}O Levels

E(level)†	Comments
10.8×10^3	
12.0×10^3	E(level): broad: likely unresolved multiplet including ^{17}O*(11.82,12.00,12.22,12.42 MeV).
13.6×10^3	E(level): strongest population of this state is consistent with configuration=^{16}O (6^+,16.29 MeV)$\otimes p_{1/2}$ in a weak coupling scheme.
14.9×10^3	
19.0×10^3	The evaluator associates this level with the E_x=19.6 MeV level.

† From (2009Mi23).

^{12}C(^{6}Li,p) 1986Sm10,2008Cr03

1960Sh05: Experiment was performed with 2-MeV Li ions at Van de Graaff/Saclay. Differential cross sections and angular distributions of the ground and first four excited states of ^{17}O were measured.

1962Bl13: Absolute differential cross sections are presented for the reactions ^{12}C(^{6}Li,p)^{17}O (ground state and first three excited states) at E=3.4-4.0 MeV. Total cross sections are ≈1 mb at 4.0 MeV.

1963Ba08: Bombardment of ^{12}C by ^{6}Li ions at E=3 MeV. Relative angular distributions were determined for protons to the 2nd, 3rd, and 4th excited states of ^{17}O. Deduced nuclear properties.

1966He05: The ^{6}Li+^{12}C reaction was studied for bombarding energies E=4.5-5.5 MeV. Angular distributions and totalcross sections have been obtained at 100-keV intervals using a dE/dx-E system coupled to a computer. The reaction products for proton groups from the ground and first four excited states of ^{17}O were studied.

1967Dz01: Differential cross-section measurements for ^{6}Li+^{12}C reactions were presented in 100-keV steps between 2.4 and 8.5 MeV at 0° and in 200-keV steps between 3.4 and 7.4 MeV at 40°(lab). Outgoing particles cross sections, p_{0-3}, involving ground and first three excited states of ^{17}O were measured.

1968Me10: A positive-ion beam of ^{6}Li at E_{lab}=20 MeV impinged on a natural carbon target (130 μg/cm^2) at the Tandem Van de Graaff accelerator, Heidelberg. The reaction products were detected and identified using detector telescopes and ΔE-E method. The low-lying states of ^{17}O were not observed and the medium excitation range were not resolved in this experiment. The proton angular distribution could only be obtained for the ^{17}O*(8.46 MeV; (7/2$^+$)) excited state.

1970Jo09: An E(^{6}Li)=5.6-14.0 MeV beam impinged on a self-supporting carbon foils (evaporated from an arc onto Teepol-coated slides) with thickness 10-52 μg/cm^2 at the University of Iowa HVEC Model εN Van de Graaff accelerator. Cross sections were measured for protons, deuterons, and α particles at θ_{lab}=0° and 40° and angular distributions were measured at various energies. Solid-state, ΔE and E detectors were used to detect and identify particles. The absolute error of total cross sections is estimated to be ±15%. Energy levels of ^{17}O*(0, 0.871, 3.058, 3.846 and 4.551 MeV) were observed.

1980Ne05: A ^{6}Li ion beam at E=156 MeV bombarded a 4.5 mg/cm^2 natural ^{12}C target using the Karlsruhe Isochronous Cyclotron. Charged particles were detected by a semiconductor telescope consisteing of a ΔE surface-barrier Si detector (0.3 mm) and two germanium detectors (15 mm and 20 mm) with the energy resolution was ≈500 keV (FWHM). The solid angle covered was 4×10^{-5} sr and the angular resolution was Δθ≈0.2°. The particles were identified by an off-line-procedure on the basis of the Goulding-method. The break-up cross sections were measured.

1982Ta23: ^{12}C(^{6}Li,p), E=36,32,28 MeV; measured yield vs particle energy, $\sigma(\theta)$, fusion σ, breakup σ vs E; deduced reaction mechanism. Optical, simple breakup model analyses.

1986Sm10: ^{17}O energy levels were populated by bombardment of an E=28 MeV ion beam of ^{6}Li, from FN tandem accelerator at the University of Pennsylvania, with a self-supporting carbon foils (50 μg/cm^2; >99.5% ^{12}C). The outgoing protons were momentum analyzed in a multiangle spectrograph and detected in Ilford L4 nuclear emulsions in the focal plane. A proton spectrum was measured at θ=15° with resolution FWHM≈45 keV. Most of the known ^{17}O levels were populated. See also (1985SmZZ).

2008Cr03: XUNDL dataset compiled by McMaster, 2008.

E=32 MeV beam provided by FN tandem acclerator at Florida State. Detected charged particles using two ΔE-E Si telescopes. FWHM=110 keV. Measured protons, absolute cross sections, angular distributions. DWBA analysis.

^{17}O Levels

E(level)[†‡]	J$^\pi$[#]	L[#]	C^{2}S[#&]	Comments
0				
869 *10*				
3056 *8*				
3844 *7*	5/2$^-$			E(level): See also 3843 keV (2008Cr03: Fig. 1).
4555 *8*	3/2$^-$			E(level): See also 4554 keV (2008Cr03: Fig. 1).
5079 *15*				
5217 *8*	9/2$^-$			E(level): See also 5216 keV (2008Cr03: Fig. 1).
5380 *9*				
5719[a] *12*				E(level): See also doublet 5700 keV (2008Cr03: Fig. 1).
5877 *14*				E(level): See also doublet 5900keV (2008Cr03: Fig. 1).
6861 *2*	5/2$^+$	3	0.30	E(level): See also 6862 keV *13* (2008Cr03). Configuration=$^{12}C_{g.s.}+1p^2_{1/2},1d^3_{5/2}$-(3p-2h) (2008Cr03).

Continued on next page (footnotes at end of table)

^{12}C(^{6}Li,p) 1986Sm10,2008Cr03 (continued)

^{17}O Levels (continued)

E(level)[†‡]	J^{π}[#]	Γ[@]	L[#]	C^2S[#&]	Comments
6974 *5*					
7175 *14*					
7388[a] *14*					E(level): See also doublet 7380 keV (2008Cr03: Fig. 1).
7576 *13*	$7/2^+$		5	0.25	E(level): from (2008Cr03). E(level): See also doublet 7580 keV *16* (1986Sm10). Configuration=$^{12}C_{g.s.}+1p^2_{1/2},1d^3_{5/2}$-(3p-2h) (2008Cr03).
7690 *15*					E(level): See also doublet 7720 keV (2008Cr03: Fig. 1).
7773 *16*					
8210 *25*					
8.40×10^3					
8473 *9*	$9/2^+$		3	0.81	E(level): weighted average of 8476 keV *12* (1986Sm10) and 8470 keV *13* (2008Cr03). E(level): See also 8.46 MeV (1968Me10) which is suspected to be the $7/2^+$ member of a k=$1/2^+$ rotational band starting at the 6.37 MeV $1/2^+$ level in ^{17}O. Configuration=^{12}C g.s.+ $1p^2_{1/2},1d^3_{5/2}$-(3p-2h) (2008Cr03).
8702 *12*					
8905 *8*					E(level): See also triplet 8900 keV (2008Cr03: Fig. 1).
8966 *15*					
9181[a] *9*					E(level): See also quadruplet 9190 keV (2008Cr03: Fig. 1).
9487 *8*					
9719 *15*	$7/2^+$				E(level): See also 9712 keV (2008Cr03: Fig. 1).
9866[a] *11*					E(level): See also doublet 9870 keV (2008Cr03: Fig. 1). J^{π}: (1983Cu02) suggests a $9/2^+$ state at 9.87 MeV.
10426 *8*					
10549 *9*					
10694 *8*		<40 keV			E(level): See also 10690 keV *26* (2008Cr03).
10915	$(5/2^+)$				E(level): average of 10920 keV (1986Sm10) and 10910 keV (2008Cr03: Fig. 1).
11.03×10^3					
11815 *13*	$7/2^+$		5	0.23	E(level): from (2008Cr03). E(level): See also 11815 keV *20* (1986Sm10). Configuration=$^{12}C_{g.s.}+1p^0_{1/2},1d^5_{5/2}$-(5p-4h) (2008Cr03).
12013 *16*	$9/2^+$	<50 keV	3	0.28	E(level): weighted average of 12020 keV *20* (1986Sm10) and 12000 keV *26* (2008Cr03). Configuration=$^{12}C_{g.s.}+1p^0_{1/2},1d^5_{5/2}$-(5p-4h) (2008Cr03).
12239 *16*	$7/2^-$		2	1.32	E(level): weighted average of 12250 keV *20* (1986Sm10) and 12220 keV *26* (2008Cr03). Configuration=$^{12}C_{g.s.}+1p^3_{1/2},1d^2_{5/2}$-(2p-1h) (2008Cr03).
12428 *13*	$9/2^+$	<50 keV	5	0.20	E(level): weighted average of 12430 keV *15* (1986Sm10) and 12420 keV *26* (2008Cr03). Configuration=$^{12}C_{g.s.}+1p^0_{1/2},1d^5_{5/2}$-(5p-4h) (2008Cr03).
12760 *26*		<70 keV			E(level): from (2008Cr03). Γ: Estimated based on the FWHM of the peak in the ^{12}C(^{7}Li,d) reaction (2008Cr03).
13070 *26*					E(level): from (2008Cr03).
13580 *26*					E(level): from (2008Cr03).
14880 *26*					E(level): from (2008Cr03: quadruplet).
15620 *26*					E(level): from (2008Cr03).

† From (1986Sm10) except where noted.

‡ See also (1960Sh05,1962Bl13,1963Ba08,1966He05,1967Dz01,1970Jo09).

Continued on next page (footnotes at end of table)

^{12}C(^{6}Li,p) 1986Sm10,2008Cr03 (continued)

^{17}O Levels (continued)

[#] From (2008Cr03). Some concern is raised over the small number of nodes used in the DWBA analysis for some cases (priv. comm. J. Millener).

[@] From (1986Sm10) except where noted. Width measurement limited by detector resolution of the ^{12}C(^{6}Li,p) measurement (2008Cr03).

[&] Assuming a ^{5}He cluster and configurations as listed.

[a] Doublet.

^{12}C(^{7}Li,d) 2008Cr03

1971Sc21: The reactions ^{12}C(^{7}Li,d) and ^{13}C(^{7}Li,t) were studied at E_{cm}=13.3 MeV using the lithium beam, from the E(n)-tandem-van-de-Graaff-Accelerator of the Max-Planck-Institut ftir Kernphysik at Heidelberg, impinged on a ^{13}C target (50% ^{13}C, 50% ^{12}C and ^{16}O). The reactions products were identified by the ΔE-E information. The overall resolutions for deutrons was about 90 keV.

The integrated cross sections σ_{int} were measured in both reactions. Spin assignments were extracted from σ_{int} in the reaction ^{12}C(^{7}li,d) and a modified DWBA code was used to analyze the reaction ^{13}C(^{7}Li,t). Energy levels and J$^{\pi}$ values of ^{17}O were deduced.

1982Ta23: ^{12}C(^{7}Li,d), E=36,32,28 MeV; measured yield vs particle energy, $\sigma(\theta)$, fusion σ, breakup σ vs E; deduced reaction mechanism. Optical, simple breakup model analyses.

2008Cr03: XUNDL dataset compiled by McMaster, 2008.

E=34 MeV beam provided by FN tandem acclerator at Florida State. Detected charged particles using two ΔE-E Si telescopes. Measured absolute cross sections and $\sigma(\theta)$. DWBA analysis assuming a ^{5}He cluster transfer. FWHM=110 keV.

Theory:

1987Ar13: ^{12}C(^{7}Li,d), E(cm)=7.4,9.4 MeV; calculated (np), d emission σ, residual production σ(E) ratio. Hauser-Feshbach theory.

^{17}O Levels

E(level)‡	J$^{\pi}$‡	L‡	C^{2}S‡#	Comments
0@	5/2+			E(level),J$^{\pi}$: See also (1971Sc21).
870@	1/2+			E(level),J$^{\pi}$: See also (1971Sc21).
3060@	1/2−			E(level),J$^{\pi}$: See also (1971Sc21).
3840@	5/2−			E(level),J$^{\pi}$: See also (1971Sc21).
4550@	3/2−			E(level),J$^{\pi}$: See also (1971Sc21).
5080				E(level): from (1971Sc21).
5220@	9/2−			J$^{\pi}$: 7/2 (1971Sc21).
5380@	3/2−			
5700@&				E(level): See also doublet 5.69-MeV and 5.72-MeV (1971Sc21).
5900@&				E(level): See also doublet 5.87-MeV:J$^{\pi}$=5/2 and 5.94-MeV:J$^{\pi}$=1/2 (1971Sc21).
6360@	1/2+			
6860 *13*	5/2+	3	0.53	Configuration=$^{12}C_{g.s.}$+$1p^2_{1/2}$,$1d^3_{5/2}$-(3p-2h). E(level): See also 6.87-MeV:J$^{\pi}$=7/2 (1971Sc21).
6990	5/2			E(level),J$^{\pi}$: from (1971Sc21).
7170@	5/2−			E(level),J$^{\pi}$: See also (1971Sc21).
7380@&	9/2			J$^{\pi}$: from (1971Sc21).
7580 *13*	7/2+	5	0.59	Configuration=$^{12}C_{g.s.}$+$1p^2_{1/2}$,$1d^3_{5/2}$-(3p-2h). E(level): See also 7.56-MeV:J$^{\pi}$=9/2 (1971Sc21).
7760@	11/2−			E(level): See also triplet 7.69-MeV:J$^{\pi}$=3/2, 7.71-MeV:J$^{\pi}$=7/2 and 7.72-MeV:J$^{\pi}$=3/2 (1971Sc21).
8470 *13*	9/2+	3	1.06	Configuration=$^{12}C_{g.s.}$+$1p^2_{1/2}$,$1d^3_{5/2}$-(3p-2h). E(level): See also triplet 8.40-MeV:J$^{\pi}$=5/2, 8.47-MeV:J$^{\pi}$=9/2 and 8.50-MeV:J$^{\pi}$=5/2 (1971Sc21).
8680@	3/2−			
8900@				E(level): triplet. See also triplet 8.87-MeV:J$^{\pi}$=3/2, 8.88-MeV:J$^{\pi}$=7/2 and 8.95-MeV:J$^{\pi}$=7/2 (1971Sc21).
9190@				E(level): quadruplet. E(level): See also (1971Sc21).
9490@	5/2−			E(level): See also (1971Sc21).
9710@	7/2+			E(level): See also (1971Sc21).

Continued on next page (footnotes at end of table)

$^{12}C(^7Li,d)$ 2008Cr03 (continued)

^{17}O Levels (continued)

E(level)[‡]	J^π[‡]	Γ[†]	L[‡]	C^2S[‡#]	Comments
9870[@&]					E(level): See also doublet 9.88-MeV and 9.95-MeV (1971Sc21).
10690 *26*		<40 keV			E(level): See also 10.78-MeV (1971Sc21).
11040[@]					
11240[@]					
11820 *13*	$7/2^+$		5	0.96	Configuration=$^{12}C_{g.s.}+1p^0_{1/2},1d^5_{5/2}$-(5p-4h). E(level): See also 11.88-MeV (1971Sc21).
12000 *26*	$9/2^+$	<50 keV	3	0.56	Configuration=$^{12}C_{g.s.}+1p^0_{1/2},1d^5_{5/2}$-(5p-4h).
12220 *26*	$7/2^-$		2	2.16	Configuration=$^{12}C_{g.s.}+1p^3_{1/2},1d^2_{5/2}$-(2p-1h).
12420 *26*	$9/2^+$	<50 keV	5	0.77	Configuration=$^{12}C_{g.s.}+1p^0_{1/2},1d^5_{5/2}$-(5p-4h).
12760 *26*		<70 keV			Γ: Estimated value based on the FWHM of the peak in the $^{12}C(^7Li,d)$ reaction (2008Cr03).
13060 *26*					
13580 *26*					
14550 *26*					
14720 *26*					
14880 *26*					
15070 *26*					
15620 *26*					
15800 *26*					

† From (1986Sm10) except where noted. Width measurement limited by detector resolution of the $^{12}C(^6Li,p)$ measurement (2008Cr03).
‡ From (2008Cr03) except where noted. Some concern is raised over the small number of nodes used in the DWBA analysis for some cases (priv. comm. J. Millener).
# Assuming ^{5}He cluster, assumed configurations are listed.
@ From Fig. 1 of (2008Cr03).
& Doublet.

^{12}C(^{9}Be,α),(^{11}B,^{6}Li)

1974Ha25: An 11-MeV ^{12}C beam impinged on a 23 μg/cm^2 ^{9}Be target. Alpha particles were detected in four Si surface-barrier detectors positioned at θ_{lab}=23°, 37°, 67° and 97°. Cross sections were measured for the population of ^{17}O*(0,0.871,3.06,3.85 MeV) for E(^{12}C)$_{cm}$=2.40 to 6.34 MeV.

1975Ve10: A beam of ^{9}Be ions at E≈26 MeV impinged on a ^{12}C foil (0.1-0.2 mg/cm^2) located at the center of an evacuated scattering chamber. The charged particles were detected by a telescope consisting of an ionization chamber (ΔE detector) and a Si(Li) counter (E detector). The detected particles were separated in mass and measurement of the energy spectra by two multidimensional AI-4096 analyzers. Spectra of α particles were measured at θ=10°−100°. Excitation levels of ^{17}O*(0,0.87,3.06,3.85,4.55,5.08,7.5,8.4,9.8,11.0,11.8,13.6 MeV) were observed and authors concluded that the five-nucleon cluster ^{5}He direct transfer plays a definite role in the ^{12}C(^{9}Be,α) reaction mechanism.

1978Ma44: The ^{12}C(^{9}Be,α) reaction was studied at θ_{cm}≈19°−70° and E$_{cm}$=10-15 MeV by a ^{9}Be ion beam bombardment of a 139 μg/cm^2 thick, self-supporting ^{12}C target. Four Si surface barrier detectors were positioned at θ_{lab}=14.6°, 24.6°, 44.6°, and 54.6°. Resonances at E$_{cm}$=11.2, 11.5, 12.6, 13.8, and 14.5 MeV were identified with widths of ≈800 keV which deduced excitation functions for the ^{17}O levels at E$_x$=0, 0.871, 3.058, and 3.846 MeV.

See also (1979Bo06).

1979Ja22: A 20-MeV ^{9}Be^{3+} ion beam, from the ETH tandem Van de Graaff accelerator, impinged on a ≈40 μg/cm^2 self-supporting ^{nat}C target. The reaction products were detected by two ΔE-E telescopes consisting of surface-barrier Si detectors. Angular distributions were measured in steps of 5° at θ_{lab}=15°−160° with an overall errors ≈±10%. The ground state and the first four low-lying states of ^{17}O were observed.

1980Br05: ^{12}C(^{9}Be,α), E=27,40 MeV; measured $\sigma(\theta)$; deduced cluster transfer effects. Optical model analysis.

1981De09: Excitation functions were measured by bombarding a ^{nat}C target (≈20 μg/cm^2) with a ^{9}Be beam from the Oak Ridge E(n) tandem Van de Graaff accelerator from E$_{cm}$=5.1-11.4 MeV at θ_{lab}=7°. The emitted α-particles were momentum analyzed in an Enge split-pole magnetic spectrometer with energy resolution ≈70 keV. Fifteen states of ^{17}O were populated, ^{17}O*(0, 0.871, 3.055, 3.837, 4.551, 5.068, 5.176, 5.213, 5.382, 5.883, 6.366, 6.873, 6.986, 7.184, 7.400 MeV).

1981Hu12: ^{9}Be(^{12}C,α), E(cm)=6-15 MeV; measured $\sigma(\theta$,E); deduced deviation function confidence limits.

1981Ja09: The experiment was performed at the ETH tandem Van de Graaff accelerator/Zurich from E(^{9}Be)=12-30 MeV ion beam bombardment of a self-supporting, ≈40 μg/cm^2 thick ^{nat}C target. The emitted particles were identified with ΔE-E counter telescopes consisting of a thin surface-barrier Si detector and a thick Li-drifted Si detector. Angular distributions for transitions to different states of the final nuclei were measured at θ=5°−160° in steps of 5°. The ground state and the first four states of ^{17}O were identified.

1982Hu06: Cross Sections of ^{9}Be+^{12}C reaction were measured at the ETH tandem Van de Graaff accelerator/Zurich by a ^{9}Be (and ^{12}C) ion beam impinging on a self-supporting 40 μg/cm^2 C target (and 60 μg/cm^2 Be target). Data were taken in the energy range E$_{cm}$=5.9-15.4 MeV in steps of 107 keV at several angles between 5° and 175°. 266 excitation curves for the protons, deuterons, tritons, and α particles emission were observed including the energy levels of ^{17}O*(0, 0.871, 3.055 and 3.841 MeV).

1996Ja12: ^{12}C(^{11}B,^{6}Li), E=28-40 MeV; measured $\sigma(\theta)$, $\sigma(\theta$,E(^{6}Li)). Exact finite-range DWBA analysis.

Theory:

1981La15: ^{9}Be(^{12}C,α), E(cm)=6-15 MeV; calculated σ(E); deduced resonance structure. Statistical model, energy-dependent deviation function.

1983Ja09: ^{12}C(^{9}Be,α), E(cm)=5.9-15.4 MeV; calculated $\sigma(\theta)$ vs E; deduced nonstatistical contribution reaction mechanism. DWBA, coupled-channels model analyses, one-, two-step transfer processes.

1986Be19: ^{12}C(^{9}Be,α), E not given; calculated $\sigma(\theta)$ asymmetry parameter; deduced parameter statistical significance.

^{17}O Levels

E(level)	J$^{\pi}$ [a]
0 [†&]	5/2$^+$
871 [†&]	1/2$^+$
3060 [†]	1/2$^-$

Continued on next page (footnotes at end of table)

$^{12}C(^{9}Be,\alpha),(^{11}B,^{6}Li)$ (continued)

^{17}O Levels (continued)

E(level)	J^{π}[a]	Comments
3840[†&]	5/2^{-}	J^{π}: 7/2^{-} (1978Ma44).
4550[‡]	3/2^{-}	
5080[#@]	3/2^{+}	E(level): 5.068-MeV (1981De09).
5176?[@]		E(level): This level is not supported by any other results.
5213[@&]		
5382[@]		
5883[@]		
6366[@]		
6873[@]		
6986[@]		
7184[@]		
7400[@]		
7500[#]		E(level): measured. May correspond to the known levels of ^{17}O*(7.29-MeV:J^{π}=3/2^{+} and 7.38-MeV:J^{π}=5/2^{+})) (1975Ve10).
8400[#]	7/2^{+}	J^{π}: from (1975Ve10).
9800[#]	9/2^{+}	J^{π}: from (1975Ve10).
11000[#]		
11800[#]		
13600[#]		

[†] Observed in (1974Ha25, 1975Ve10, 1978Ma44, 1979Ja22, 1981De09, 1981Ja09, 1982Hu06).
[‡] Observed in (1975Ve10, 1979Ja22, 1981De09, 1981Ja09).
[#] Observed in (1975Ve10).
[@] Observed in (1981De09).
[&] Observed in (1996Ja12: $^{12}C(^{11}B,^{6}Li)$).
[a] Known levels except where noted.

^{13}C(α,γ) 1983Ra29

1974Be32: ^{13}C(α,γ), E=5.12-5.35 MeV; measured σ(E,E$_\gamma$,θ). ^{17}O deduced resonance.
1983Ra29: ^{13}C(α,γ), E=3.63-3.68, 6.16-6.19 MeV; measured σ(E), E$_\gamma$, I$_\gamma$. ^{17}O levels deduced ($\Gamma_\alpha\Gamma_\gamma/\Gamma$), B(E1).
2009Ma70: ^{13}C(α,γ), E=2.000, 2.270 MeV; measured E$_\gamma$, I$_\gamma$, $\gamma(\theta)$, σ, and $\sigma(\theta)$; deduced astrophysical S factors.

^{17}O Levels

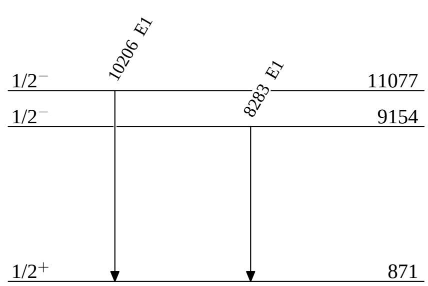
E(level)	J$^\pi$	Comments
871	1/2$^+$	
9154	1/2$^-$	E(level): from E$_\alpha$=3655 keV (1983Ra29). J$^\pi$: from (1983Ra29).
10419 *3*		E(level): from E$_\alpha$=5310 keV *4* (1974Be32).
11077	1/2$^-$	E(level): from E$_\alpha$=6170 keV (1983Ra29). J$^\pi$: from (1983Ra29).

γ(^{17}O)

E$_\gamma$	E$_i$(level)	J$^\pi_i$	E$_f$	J$^\pi_f$	Mult.	Comments
8283	9154	1/2$^-$	871	1/2$^+$	E1	(1983Ra29) measured $\Gamma_\alpha\Gamma_{\gamma1}/\Gamma_{total}$=0.65 eV *7*. Using $\Gamma_\alpha/\Gamma_{total}$=0.45 from (1968Ke02) they deduced $\Gamma_{\gamma1}$=1.44 eV *26* which corresponds to B(E1)=(2.4±0.5)×10^{-3} e^{2}fm^2 (1983Ra29).
10206	11077	1/2$^-$	871	1/2$^+$	E1	(1983Ra29) measured $\Gamma_\alpha\Gamma_{\gamma1}/\Gamma_{total}$=1.46 eV *13*. Using $\Gamma_{\alpha0}$=0.3 keV from (1973Ad02) and Γ_{total}=2.4 keV *3* from (1981Hi01) they deduced $\Gamma_{\gamma1}$=11.6 eV *18*; but this differs from the present analysis. See discussion in Adopted Levels.

^{13}C(α,γ) 1983Ra29

Level Scheme



$^{17}_{8}O_{9}$

^{13}C(α,n)

For analyses and measurements of astrophysical S-factors and ANC^2 values see (1968Da05,2006Jo11,2008Pe09,2014LaZU).

1954Tr09: ^{13}C(α,n), E=1.0-3.5 MeV; measured reaction products, E_n, I_n; deduced neutron yields; calculated energy levels.
1956Bo61: ^{13}C(α,n), E=1.8-5.3 MeV; cross sections and widths of the resonances were detremined.
1957Wa46: ^{13}C(α,n); measured products; deduced σ, σ(E), resonance parameters.
1963Sp02: ^{13}C(α,nγ), E=5-10 MeV; the excitation function for 6 and 7 MeV gamma radiation from the reaction ^{13}C(α,nγ) has been studied at intervals of approximately 10 keV for E_α=5 to 10 MeV.
1965Ba32: Cross sections for the reaction ^{13}C(α,α) at θ_{cm}=54.7°, 107.9°, 142.6°, 169.6° and for the reaction ^{13}C(α,n)^{16}O at θ_{cm}=0° were measured. A beam of E(α)=2-3.5 MeV from the 5.5-MeV Van de Graff accelerator bombarded a self-supporting foils made either from 41.6% ^{13}C-enriched methyl iodide, or from 56.7% ^{13}C-enriched methane with thickness ≈15 μg/cm^2. Using dispersion-theory analysis, a consistent set of J$^\pi$ and partial-width values for 11 excitation energies E_x=8-9 MeV were obtained. See also (1965BaZY).
1967Se07: ^{13}C(α,n), E=1.95-5.57 MeV; measured total cross section. Deduced Γ_a, Γ_n along with the reduced widths γ_α^2 and γ_n^2 for the levels corresponding to the 2.68, 2.81, 3.72, and 4.62-MeV resonances.
1968Ke02: Cross sections of reactions ^{13}C(α,α_0) and ^{13}C(α,n) were measured by bombardment of an E_α=12 MeV beam on to self-supporting, 20-30 μg/cm^2 thick, enriched ^{13}C targets at the Van de Graaff facility/Australian National University. Two surface-barrier detectors (for (α,α_0)) and two 2.5 cm×5 cm plastic scintillators (for (α,n)) were used to detect particles. Using a dispersion-theory analysis, the J$^\pi$ and partial width values were obtained for 11 states of ^{17}O with E_x=9-10 MeV.
1969Sc04: ^{13}C(α,n), E=1.38-2.26 MeV; measured angular distribution of n-polarization. ^{17}O deduced resonances, J, π, level-width.
1970Ro08: Thin foil targets of 50.5% enriched ^{13}C, 30.3 μg/cm^2 *17* thick, were bombarded with E(α)=4.5-10.5 MeV ion beams produced from the University of Virginia 5.5 MeV Van de Graaff accelerator. Neutrons were detected using a 2.5 cm×2.5 cm long stilbene crystal and a 2.5 cm×5.0 cm long Ne 213 liquid scintillator with detection efficiencies of ±6%. The energy scale for the excitation function was calibeated with an uncertainty of ±10 keV. The excitation function was measured at θ= 0° and angular distributions were measured at θ=0°−170°. Energy levels of ^{17}O at E_x=10-13 MeV with J$^\pi$ values up to 9/2 were deduced.
1971Ba06: ^{13}C(α,n), E=3.36-4.80 MeV; measured σ(E; θ), P(n)(E; θ). ^{17}O resonances deduced J, π.
1973Ba10: ^{13}C(α,n), E=1-5 MeV; measured σ(E); ^{17}O deduced resonances, level-width.
1973Bu14: ^{13}C(α,n), E=2.075,2.25,2.43 MeV; measured n-polarization(θ), σ(θ). ^{17}O levels deduced J, π.
1973Lo16: ^{13}C(α,n), measured E_n, I_n.
1975Be44: ^{13}C(α,nγ), measured σ(E,E_γ). ^{17}O deduced resonances, Γ.
1976Mc11: ^{13}C(α,n), E=4.2-8.7 MeV; measured σ(E,E_n,θ). ^{17}O deduced T=3/2 levels, Γ. Enriched target.
1976Ra36: ^{13}C(α,n), E=0.60-1.15 MeV; measured σ(E); deduced astrophysical σ factors. ^{17}O 1.056-MeV resonance deduced parameters. Enriched target.
1981HaZV: ^{13}C(α,n), E≈35 MeV; measured σ(En,θ). Cluster transfer, DWBA analysis. Tof, solid state counters, magnetic spectrograph.
1982CrZY: ^{13}C(α,n), E=35 MeV; measured σ(E_n), σ(θ). DWBA, cluster transfer, knockout mechanisms.
1983HaZX: ^{13}C(α,n), E=35 MeV; measured σ(θ). DWBA, three nucleon stripping, semimicroscopic, cluster models.
1990We10: ^{13}C(α,n), E=2.406-3.308 MeV; measured σ(θ), polarization. New design high pressure ^{4}He-polarimeter.
1993Br17: ^{13}C(α,n), E=650-1600 KeV; measured yield vs E. ^{17}O deduced resonances, Γ_n, Γ_α, resonance strengths.
1993Dr08: ^{13}C(α,n), E(cm)≈275-1075 keV; measured σ(E); deduced astrophysical S-factor, reaction rates at helium burning temperatures.
1993DrZZ: E=0.35-1.4 MeV; measured E_n, σ, resonance energy, width, strength, S-factor, reaction rate. Comparison with other measurements.
2001He22: ^{13}C(α,α), E=2.6-6.2 MeV; measured σ(θ). ^{13}C(α,n), E=0-2 MeV; calculated σ, S-factor following r-matrix analysis of elastic scattering data. Comparison with earlier results for s-process conditions.
2003Ka51: ^{13}C(α,n), E(cm)≈200-800 keV; deduced astrophysical S-factors, reaction rate.
2003Ku36: ^{13}C(α,n), E(cm)=0-800 keV; deduced astrophysical S-factors, reaction rates.
2005Ha69: ^{13}C(α,n), E=0.8-8.0 MeV; measured σ, neutron yields.
2007PeZZ: ^{13}C(α,n), deduced S_α factor.
2008He11: ^{13}C(α,n), E(cm)=320-700 keV; ^{13}C(α,α), E=2.6-6.2 MeV; measured radii, σ, σ(θ), S-factor. ^{17}O deduced levels, J, π, resonance parameters.

^{13}C(α,n) (continued)

2009Ma70: ^{13}C(α,n),(α,γ), E=2.000,2.270 MeV; measured Eγ, Iγ, $\gamma(\theta)$, E_n, σ, and $\sigma(\theta)$; deduced astrophysical S factors. Comparison with previous experimental data.
2018Sm01: ^{13}C(α,n), E not given; measured reaction products, Eγ, Iγ, E_n, I_n; deduced yields.
2020Fe06: ^{13}C(α,$n_{0,1,2}$), E=5.2-6.4 MeV; analyzed excitations functions and impact on backgrounds for large volume ν detectors.

Theory:
1977Li19: ^{13}C(α,n), E<7 MeV; analyzed σ(E).
1987De38: ^{13}C(α,n),(α,α), E=low; calculated transfer, elastic $\sigma(\theta)$, σ(E). Generator corrdinate method.
1996Le06: ^{17}O; calculated levels using parameters for ^{13}C+α cluster system. Semi-microscopic algebraic cluster model.
2003Ku03: ^{13}C(α,n), E(cm)=0-800 keV; calculated astrophysical S-factors, reaction rates.
2008St11: ^{13}C(α,n), analyzed reaction rates.
1997Ha37: ^{13}C(α,n), E not given; analyzed reaction σ data; deduced astrophysical S-factor vs E, extrapolation methods accuracy. Astrophysical implications.
1999An35: ^{13}C(α,n), E<10 MeV; compiled, analyzed σ, S-factors; calculated astrophysical reaction rates vs T_9. Analytical approximations.
2001Du11: ^{13}C(α,n), E(cm)=0.1-1 MeV; calculated σ, S-factor. Comparison with data, Astrophysics interest.
2001Du12: ^{13}C(α,n), E(cm)≈0.2-2 MeV; calculated S-factors. Comparisons with data.
2005Ad03: ^{13}C(α,n), E=0-5 MeV; calculated phase shifts, transition amplitudes. Comparison of DWBA and microscopic cluster model.
2005Du20: ^{13}C(α,n), E(cm)≈0.1-1.2 MeV; calculated S-factors. ^{17}O; calculated levels, J, π. Generator coordinate method, comparison with data.
2005Pi19: ^{13}C(α,n), E=low; analyzed astrophysical reaction rates.
2007Mu10: ^{13}C(α,n), E=0-0.9 MeV; calculated astrophysical S-factor. Asymptotic normalization coefficient method. Comparison with data. 2008KaZX: ^{13}C(α,n), E≈0.1-10 MeV; analyzed S-factors.
2008Lu01: ^{13}C(α,n), E not given; analyzed reaction rates as neutron sources for s process in AGB stars.
2012Mi24: ^{13}C(α,n), E<1 MeV; analyzed available data; calculated reaction rates, isotope abundances. Comparison with available data.
2014Ku13: ^{13}C(α,n), E=0.7-4.7 MeV; calculated σ using multi-channel R-matrix with care for covariances; deduced resonances. Compared to ENDF/B-VII.1 and Harisopulos data.
2015LaZW: ^{13}C(α,n), E(cm)=0-1.2 MeV; calculated S-factor using R-matrix. Compared to data.
2015Vl01: ^{13}C(α,n), E=4-9 MeV; analyzed available data; deduced thick target yields and their uncertainties.
2016La06: ^{13}C(α,n), E(cm)<1 MeV; calculated S-factors. R-matrix, Trojan horse method (THM) resonance parameters.
2016Sp03: ^{13}C(α,n), E(cm)=0-1.2 MeV; compiled S-factor data, fitting THM (Trojan Horse Method) and calculations.
2017HaZY: ^{13}C(α,n), E=0-5.4 MeV ; calculated σ. ^{13}C(α,α), E=2-5.7 MeV; calculated $\sigma(\theta)$.
2017Mu14: ^{13}C(α,n), E(cm)<1.1 MeV; calculated astrophysical S factor as a function of the α-^{13}C relative kinetic energy using the R-matrix approach for resonances and Trojan horse method (THM) for S factor. Comparison with experimental data. Relevance to neutron generation in low-mass AGB stars.
2017Pa45: ^{13}C(α,n), E not given; analyzed available data; deduced isotopic abundance ratios of s-elements in presolar SiC grains.
2017Pe13: ^{13}C(α,n), E=0.8-8.0 MeV; analyzed σ(E) measured in the work of 2005Ha69; deduced uncertainty in the cross section of about 50% above 5 MeV, due to changes in neutron detector efficiency due to different neutron energies that are possible above the ^{16}O first excited-state, and which were not adequately accounted for in 2005Ha69 who used a moderated neutron detector. Relevance to s-process nucleosynthesis.
2017Tr03: ^{13}C(α,n), E(cm)<1 MeV; analyzed available data; deduced σ, S-factors, astrophysical reaction rates, asymptotic normalization coefficients.
2018Cr02: ^{13}C(α,n), E not given; analyzed available data; deduced impact of reaction rate variations on variations of the element surface distributions.
2018Mo15: ^{13}C(α,n), E=0.8-8 MeV; analyzed previous experiments for σ(E) data and deduced corrected σ(E) based on improved determination of neutron detection efficiency; calculated branching ratios for the (α,n0), (α,n1), (α,n2), (α,n3) and (α,n4) channels using TALYS code, and compared with experimental values.
2018Ze01: ^{13}C(α,n), E<9 MeV; calculated σ of inverse reaction using the reciprocity theorem and Web calculator.

^{13}C(α,n) (continued)

^{17}O Levels

Notes:
Many authors viewed the uncertainty in excitation energy as equal to the uncertainty in resonance energy; it was not possible to resolve this issue.

E(level)[†]	J$^{\pi}$	Γ	L	E$_{\alpha}$(res) (keV)	Comments
6860.3[‡] *7*				656.0 *7*	E(level): from E$_{\alpha}$=656.0 keV *7* (1993Br17). $(\omega\gamma)_n$=1.85×10^{-4} eV *20*, $(\omega\gamma)_{\gamma}$<5 μeV (1993Br17).
6972.1[‡] *8*				802.2 *8*	E(level): from E$_{\alpha}$=802.2 keV *8* (1993Br17). $(\omega\gamma)_n$=4.54×10^{-4} eV *35*, $(\omega\gamma)_{\gamma}$<8 μeV (1993Br17).
7166.4[#] *15*	5/2[@]	1.5[#] keV *2*		1056.3 *15*	E(level): from E$_{\alpha}$=1056.3 keV *15* (1973Ba10). See also E$_{\alpha}$(keV)=1056 (1976Ra36), 1054 (2005Ha69). Γ: See also Γ=5 keV (1957Wa46), Γ$_n$/Γ$_{\alpha}$=(1300) (1957Wa46). ωγ=12.1 eV *6* (2005Ha69), 11.9 eV *6* (Deduced from the resonance yield, 4434±135 n/μC (1992Br05, 1973Ba10), and the stopping power in ^{13}C (Ziegler, The Stopping and Range of Ions in Matter, Vol. 3 (1977)); see (1993Br17)).
7202?					E(level): authors (2008Pe09) listed the value from (1993Ti07). Involvement in ^{13}C(α,n) is suggested from its population in ^{13}C(^{7}Li,t). Γ: Γ$_n$=400 keV, Γ$_{\alpha}$=0.09 keV (2008Pe09) which is consistent with (1966Li03: Γ$_n$/Γ>0.99 in ^{16}O+n measurement).
7380.8[#] *15*	5/2+[&]	0.6[#] keV *+2−1*		1336.7 *15*	E(level): from E$_{\alpha}$=1336.7 keV *15* (1973Ba10). See also E$_{\alpha}$=1336 keV (2005Ha69). Γ: See also Γ(keV)=3 (1969Sc04), ≤4 (1957Wa46), Γ$_n$/Γ$_{\alpha}$=(450) (1957Wa46). ωγ=33.3 eV *18* (2005Ha69).
7383.8[#] *15*		0.8[#] keV *+3−2*	3,2[a]	1340.6 *15*	E(level): from E$_{\alpha}$=1340.6 keV *15* (1973Ba10).
7572.9 *21*	7/2−[&]	≤1[#] keV	4,3[a]	1587.9 *25*	E(level): from E$_{\alpha}$=1587.9 keV *21*, which is the average of (1973Ba10: 1590 keV *2*) and (1993Br17: 1585.7 keV *15*). See also E$_{\alpha}$=1590 keV (2005Ha69). Γ: See also Γ(keV)=3 (1969Sc04), ≤4 (1957Wa46). ωγ=10.8 eV *5* (1993Br17), 11.5 eV *12* (2005Ha69).
7693[#] *6*	5/2+[&]	≤15[#] keV	3,2[a]	1745 *6*	E(level): from E$_{\alpha}$=1745 keV *6* (1973Ba10). Γ: See also Γ=22 keV (1957Wa46,1969Sc04).
7951[#] *8*	1/2+[&]	79[b] keV *10*	1,0[a]	2083 *8*	E(level): from E$_{\alpha}$=2083 keV *8* (1973Ba10). See also E$_{\alpha}$(keV)=2090 (1956Bo61), 2080 (1967Se07), 2075 (1973Bu14). E(level): triplet (1957Wa46). Γ: See also Γ(keV)=75 (1973Ba10), 110 (1957Wa46,1969Sc04), Γ(lab)=100 keV (1956Bo61), Γ$_n$/Γ$_{\alpha}$=10 (1957Wa46). J$^{\pi}$: See also (1973Bu14).
8079[#] *8*	3/2−[&]	71[b] keV *8*	2,1[a]	2250 *8*	E(level): from E$_a$=2250 keV *8* (1973Ba10). See also E$_{\alpha}$(keV)=2250 (1956Bo61,1967Se07), 2240 (1963Bu14). Γ: See also Γ(keV)=70 (1957Wa46, 1969Sc04), 110 (1973Ba10), Γ(lab)=100 keV (1956Bo61), Γ$_n$/Γ$_{\alpha}$=10 (1957Wa46). J$^{\pi}$: See also (1973Bu14) who suggest the π is ambiguous.
8199[#] *8*	3/2+[&]	71[b] keV *5*	1,2[a]	2407 *8*	E(level): from 2407 keV *8* (1973Ba10). See also

Continued on next page (footnotes at end of table)

$^{13}C(\alpha$,n) (continued)

^{17}O Levels (continued)

E(level)[†]	J^π	Γ	L	E_α(res) (keV)	Comments
					E_α(keV)=2410 (1967Se07), 2420 (1956Bo61), 2430 (1973Bu14), 2440 (1954Tr09). Γ: See also Γ(keV)=60 (1957Wa46,1969Sc04), 70 (1973Ba10), Γ(lab)=80 keV (1956Bo61), Γ_n/Γ_α=13 (1957Wa46). J^π: See also (1973Bu14) who suggest the π is ambiguous.
8350[#] *4*	1/2−[&]	9[b] keV *3*	0,1[a]	2604 *4*	E(level): from E_α=2604 keV *4* (1973Ba10). See also E_α(keV)=2610 (1967Se07), 2605 (1956Bo61), E_n=4440 keV (1956Be98: Fig. 5 top). Γ: See also Γ(keV)=18 (1957Wa46,1969Sc04), 15 (1973Ba10), Γ(lab)≤6 keV (1956Bo61), Γ_n/Γ_α=6.7 (1957Wa46). J^π: See also (1973Bu14) who suggest the π is ambiguous.
8408[#] *3*	5/2+[b]	4[b] keV *3*	3,2[c]	2680 *3*	E(level): from E_α=2680 keV *3* (1973Ba10). See also E_α(keV)=2680 (1967Se07), 2660 (1954Tr09), 2690 (1956Bo61), E_n=4530 keV (1956Be98: Fig. 5 top). Γ: See also Γ(keV)=8 (1973Ba10), 11 (1957Wa46), Γ(lab)=10 keV (1956Bo61), Γ_n=3.84 keV and Γ_α=0.16 keV (1967Se07), Γ_n/Γ_α=19 (1957Wa46).
8473[#] *3*	7/2[@]	7[b] keV *3*		2765 *3*	E(level): from E_α=2765 keV *3* (1973Ba10). See also E_α(keV)=2770 (1967Se07), 2775 (1956Bo61), 2760 (1954Tr09), E_n=4590 keV (1956Be98: Fig. 5 top). E(level): doublet (1957Wa46). Γ: See also Γ(keV)=8 (1973Ba10), 9 (1957Wa46), Γ(lab)=10 keV (1956Bo61), Γ_n/Γ_α=31 (1957Wa46).
8507[#] *3*	(3/2,5/2−)[@b]	5[b] keV *3*	2,3[c]	2809 *3*	E(level): from E_α=2809 keV *3* (1973Ba10). See also E_α(keV)=2810 (1967Se07), 2825 (1956Bo61), E_n=4630 keV (1956Be98: Fig. 5 top). Γ: See also Γ(keV)=6 (1973Ba10), 11 (1957Wa46), Γ(lab)≤7 keV (1956Bo61), Γ_n=4.57 keV and Γ_α=0.43 keV (1967Se07), Γ_n/Γ_α=2.8 (1957Wa46).
8698[#] *5*	3/2−[d]	50[b] keV *3*		3059 *5*	E(level): from E_α=3059 keV *5* (1973Ba10). See also E_α(keV)=3070 (1967Se07), 3090 (1956Bo61), 3100 (1971Ba06), E_n=4850 keV (1956Be98: Fig. 5 top). E(level): triplet (1957Wa46). Γ: See also Γ(keV)=50 (1973Ba10), 85 (1957Wa46), Γ(lab)=90 keV (1956Bo61), Γ_n/Γ_α=17 (1957Wa46).
8700?[d]	1/2−[d]			≈3100	E(level): broad; from E_α≈3100 keV (1971Ba06).
8896[#] *8*	3/2+[d]	101[b] keV *3*		3318 *8*	E(level): from E_α=3318 keV *8* (1973Ba10). See also E_α(keV)=3320 (1967Se07), 3300 (1954Tr09), 3330 (1956Bo61), 3360 (1971Ba06), E_n=5080 keV (1956Be98: Fig. 5 top). Γ: See also Γ(keV)=115 (1973Ba10), 110 (1957Wa46), Γ(lab)=150 keV (1956Bo61), Γ_n/Γ_α=3.5 (1957Wa46).
8970[#] *4*	7/2−[d]	21[b] keV *3*		3415 *4*	E(level): from E_α=3415 keV *4* (1973Ba10). See also E_α(keV)=3420 (1956Bo61, 1967Se07,1971Ba06), E_n=5130 keV (1956Be98: Fig. 5 top). Γ: See also Γ(keV)=14 (1973Ba10), 35 (1957Wa46). Γ(lab)=30 keV (1956Bo61), Γ_n/Γ_α=35 (1957Wa46).
9146[#] *4*		4[b] keV *3*		3645 *4*	E(level): from E_α=3645 keV *4* (1973Ba10). See also E_α(keV)=3650 (1967Se07), 3670 (1956Bo61), 3640 (1971Ba06). Γ: See also Γ=9 keV (1973Ba10), Γ(lab)≤8 keV

Continued on next page (footnotes at end of table)

^{13}C(α,n) (continued)

^{17}O Levels (continued)

E(level)[†]	J$^{\pi}$	Γ	L	E_{α}(res) (keV)	Comments
					(1956Bo61).
9180[d]				3690	E(level): from E_{α}=3690 keV (1971Ba06).
9199[#] *4*	5/2[b]	4[b] keV *3*	2,3[c]	3714 *4*	E(level): from E_{α}=3714 keV *4* (1973Ba10). See also E_{α}(keV)=3720 (1967Se07,1971Ba06), 3730 (1956Bo61), E_n=5380 keV (1956Be98: Fig. 5 top). Γ: See also Γ=8 keV (1973Ba10), Γ(lab)≤5 keV (1956Bo61), Γ_n=3.86 keV and Γ_{α}=0.14 keV (1967Se07).
9491[#] *4*		8[b] keV *3*		4096 *4*	E(level): from E_{α}=4096 keV *4* (1973Ba10). See also E_{α}(keV)=4120 (1967Se07), 4125 (1956Bo61), 4110 (1971Ba06). Γ: See also Γ=16 keV (1973Ba10), Γ(lab)=15 keV (1956Bo61).
9.6×10^3?[d]	3/2$^-$ [d]				E(level): broad; from unresolved broad level near E_{α}≈4.3E3 keV (1971Ba06).
9719[#] *5*	7/2$^+$ [d]	25[#] keV		4394 *5*	E(level): from E_{α}=4394 keV *5* (1973Ba10). See also E_{α}=4380 keV (1971Ba06).
9738	3/2$^+$ [d]	15[b] keV *3*		4420	E(level): from E_{α}=4420 keV (1956Bo61,1967Se07,1971Ba06), This level is associated with E_x=9786 keV in Adopted Levels. Γ: See also Γ(lab)=25 keV (1956Bo61). It appears this level is not real. No single experiment reports more than two of the three levels at 9.72, 9.74 and 9.77 MeV. The energies of these levels are better resolved in ^{16}O(n,n) (1980Ce03).
9773?[#] *15*		≈25[#] keV		4465 *15*	E(level): from E_{α}=4465 keV *15* (1973Ba10). See also E_{α}(keV)=4500 (1956Bo61), (4490) (1967Se07). Γ: See also Γ(lab)=70 keV (1956Bo61).
9863[#] *5*	(9/2$^+$)[d]	14[#] keV		4583 *5*	E(level): from E_{α}=4583 keV *5* (1973Ba10). See also E_{α}=4580 keV (1971Ba06).
9876[#] *15*	9/2[b]	5[b] keV *3*	4,5[c]	4600 *15*	E(level): from E_{α}=4600 keV *15* (1973Ba10). See also E_{α}(keV)=4620 (1967Se07), 4630 (1956Bo61). Γ: See also Γ(keV)≈10 (1973Ba10), Γ(lab)=15 keV (1956Bo61), Γ_n=4.7 keV and Γ_{α}=0.3 keV (1967Se07).
9975[#] *20*	5/2$^+$ [d]	≈80[#] keV		4730 *20*	E(level): from E_{α}=4730 keV *20* (1973Ba10). See also E_{α}(keV)=4750 (1956Bo61), 4700 (1971Ba06), (4770) (1967Se07). Γ: See also Γ(lab)=200 keV (1956Bo61).
10044[#] *20*		≈100[#] keV		4820 *20*	E(level): from E_{α}=4820 keV *20* (1973Ba10). See also E_{α}=(4850) keV (1967Se07).
10136[d]				4940	E(level): from E_{α}=4940 keV (1971Ba06).
10177[#] *5*	(5/2$^+$,7/2$^-$)[e]	50[b] keV *3*		4993 *5*	E(level): from E_{α}=4993 keV *5* (1973Ba10). See also E_{α}(keV)=4980 (1971Ba06), 4995 (1970Ro08), 5040 (1967Se07), 5050 (1956Bo61). Γ: See als 45 keV (1973Ba10), Γ(lab)=65 keV (1956Bo61).
10335[#] *15*	(5/2$^+$,7/2$^-$)[e]	150[#] keV		5200 *15*	E(level): from E_{α}=5200 keV *15* (1973Ba10). See also E_{α}=5185 keV (1970Ro08).
10422.0[f] *20*	(5/2$^-$,7/2$^-$)[e]	14[g] keV *3*		5314.0 *25*	E(level): from E_{α}=5314.0 keV *25* (1975Be44). See also E_{α}(keV)=5317 *10* (1963Sp02), 5325 *10*

Continued on next page (footnotes at end of table)

^{13}C(α,n) (continued)

^{17}O Levels (continued)

E(level)[†]	J^{π}	Γ	E_{α}(res) (keV)	Comments
				(1973Ba10), 5290 (1967Se07), 5370 (1970Ro08). Γ: See also Γ(keV)=11 *9* (1975Be44), 23 keV (1973Ba10).
10498	(5/2$^+$,7/2$^-$)[e]		5413	E(level): from E_{α}=5413 keV, which is the average of (1967Se07: 5410 keV) and (1970Ro08: 5415 keV).
10558.1[f] *20*	(7/2$^-$,9/2$^+$)[e]	51[f] keV *2*	5492.0 *25*	E(level): from E_{α}=5492.0 keV *25* (1975Be44). See also E_{α}(keV)=5496 *10* (1963Sp02), 5540 (1970Ro08). Γ: See also Γ=50 keV *20* (1963Sp02).
10777.5[f] *20*	(1/2$^+$,7/2$^-$)[e]	74[f] keV *3*	5779.0 *25*	E(level): from E_{α}=5779.0 keV *25* (1975Be44). See also E_{α}(keV)=5771 *10* (1963Sp02), 5790 (1970Ro08). Γ: See also Γ=85 keV *30* (1963Sp02).
10904[f] *2*	(5/2)[e]	46[f] keV *2*	5945 *3*	E(level): from E_{α}=5945 keV *3* (1975Be44). See also E_{α}(keV)=5945 *10* (1963Sp02), 5995 (1970Ro08). Γ: See also Γ=55 keV *20* (1963Sp02).
11036[f] *2*		31[f] keV *3*	6117 *3*	E(level): from E_{α}=6117 keV *3* (1975Be44). See also E_{α}=6107 keV *10* (1963Sp02). Γ: See also Γ=45 keV *10* (1963Sp02).
11076[h] *5*	1/2$^-$[h]	5.0[h] keV *11*	6169	T=3/2 (1976Mc11) E(level): from E_{α}=6169 keV which is calculated from the E_x given in (1976Mc11); see also E_{α}=6220 keV (1970Ro08). J^{π}: See also (3/2$^-$,7/2$^+$) (1970Ro08). Γ: From (1976Mc11). A preliminary result, 5 keV *1*, from a BAPS was picked up by (1973Ad02: ^{18}O(^{3}He,α) and used to derive various partial widths. See also $(\Gamma_{\alpha0}\Gamma_{n0})^{1/2}/\Gamma_{tot}$=0.23 (1976Mc11) which corresponds to $\Gamma_{\alpha0}/\Gamma$=0.06 *2* when combined with the value Γ_{n0}/Γ=0.91 *15* (1973Ad02).
11237[f] *2*	(3/2$^-$,7/2$^+$)[e]	80.0[f] keV *25*	6380 *3*	E(level): from E_{α}=6380 keV *3* (1975Be44). See also E_{α}(keV)=6367 *10* (1963Sp02), 6480 (1970Ro08). Γ: See also Γ=100 keV *30* (1963Sp02).
11622[f] *2*		65[f] keV *2*	6883 *3*	E(level): from E_{α}=6883 keV *3* (1975Be44). See also E_{α}=6878 keV *10* (1963Sp02). Γ: See also Γ=120 keV *30* (1963Sp02).
11750[g] *10*		40[g] keV *25*	7051 *10*	E(level): from E_{α}=7051 keV *10* (1963Sp02).
11815[g] *15*	(5/2,7/2)[e]	12[g] keV *3*	7136 *15*	E(level): from E_{α}=7136 keV *15* (1963Sp02). See also E_{α}=7160 keV (1970Ro08).
12005[g] *15*			7384 *15*	E(level): from E_{α}=7348 keV *15* (1963Sp02).
12109[g] *20*		150[g] keV *50*	7520 *20*	E(level): from E_{α}=7520 keV *20* (1963Sp02).
12274[g] *15*		100[g] keV *30*	7736 *15*	E(level): from E_{α}=7736 keV *15* (1963Sp02).
12384[g] *20*			7880 *20*	E(level): from E_{α}=7880 keV *20* (1963Sp02).
12420[g] *15*			7927 *15*	E(level): from E_{α}=7927 keV *15* (1963Sp02).
12458[h] *5*	3/2$^-$[h]	8[h] keV *2*	7977	T=3/2 (1976Mc11) E(level): from E_{α}=7977 keV which is calculated from the E_x given in (1976Mc11). See also E_{α}=8000 keV (1970Ro08). J^{π}: See also (3/2$^-$,9/2$^+$) (1970Ro08).
12595[g] *15*		75[g] keV *30*	8156 *15*	E(level): from E_{α}=8156 keV *15* (1963Sp02).
12669[g] *15*	(3/2$^-$,9/2$^+$)[e]	≈75[g] keV	8253 *15*	Γ: Beginning in (1971Aj02) the Γ for this level was listed at ≈5 keV attributed to ^{13}C(α,n) (1969Sp02). However this was a typo. (1969Sp02) report ≈75 keV. E(level): from E_{α}=8253 keV *15* (1963Sp02). See also E_{α}=8328 keV (1970Ro08).
12812[g] *25*			8440 *25*	E(level): from E_{α}=8440 keV *25* (1963Sp02).
12927[g] *20*	(1/2$^+$,7/2$^-$)[e]	≥150[g] keV	8590 *20*	E(level): from E_{α}=8590 keV *20* (1963Sp02). See also E_{α}=8657 keV (1970Ro08).

Continued on next page (footnotes at end of table)

^{13}C(α,n) (continued)

^{17}O Levels (continued)

E(level)[†]	J$^{\pi}$	Γ	E$_{\alpha}$(res) (keV)	Comments
12944[h] *6*	1/2+[h]	6[h] keV *2*	8612	T=3/2 (1976Mc11) E(level): from E$_{\alpha}$=8612 keV which is calculated from the E$_x$ given in (1976Mc11).
12993[h] *6*	5/2−[h]	≤3[h] keV	8676	T=3/2 (1976Mc11) E(level): from E$_{\alpha}$=8676 keV which is calculated from the E$_x$ given in (1976Mc11). See also 13027 keV *20* (1963Sp02: E$_{\alpha}$=8720 keV *20*).
13076[g] *15*		16[g] keV *4*	8785 *15*	E(level): from E$_{\alpha}$=8785 keV *15* (1963Sp02).
13484[g] *15*		≈120[g] keV	9319 *15*	E(level): from E$_{\alpha}$=9319 keV *15* (1963Sp02).
13610[g] *15*		250[g] keV *100*	9483 *15*	E(level): from E$_{\alpha}$=9483 keV *15* (1963Sp02). Γ: =150-350 keV.

[†] Level energies are deduced using E$_{\alpha}$(res) and ^{13}C, ^{4}He and ^{17}O mass excesses from (2021Wa16: AME-2020) where E$_{\alpha}$(res) is listed. E$_x$=S(α)+M(^{13}C)/(M(^{4}He)+M(^{13}C))*E$_{\alpha}$(res).
[‡] From (1993Br17).
[#] From (1973Ba10).
[@] From (1957Wa46).
[&] From (1969Sc04). But see (1973Bu14) who claim π deduced by (1969Sc04) is sometimes ambiguous.
[a] L$_{\alpha}$,L$_{\alpha'}$ (1969Sc04).
[b] From (1967Se07).
[c] L$_{\alpha}$,L$_{n}$ (1967Se07).
[d] From (1971Ba06).
[e] From (1970Ro08).
[f] From (1975Be44).
[g] From (1963Sp02).
[h] From (1976Mc11).

^{13}C(α,n),(α,α) 1965Ba32,1968Ke02

1965Ba32: Cross sections for the reaction ^{13}C(α,α) at θ_{cm}=54.7°, 107.9°, 142.6°, 169.6° and for the reaction ^{13}C(α,n)^{16}O at θ_{cm}=0° were measured. A beam of E(α)=2-3.5 MeV from the 5.5-MeV Van de Graff accelerator bombarded a self-supporting foils made either from 41.6% ^{13}C-enriched methyl iodide, or from 56.7% ^{13}C-enriched methane with thickness ≈15 μg/cm^2. Using dispersion-theory analysis, a consistent set of J$^\pi$ and partial-width values for 11 excitation energies E$_x$=8-9 MeV were obtained. See also (1965BaZY).

1968Ke02: Cross sections of reactions ^{13}C(α,α_0) and ^{13}C(α,n) were measured by bombardment of an E$_\alpha$=12 MeV beam on to self-supporting, 20-30 μg/cm^2 thick, enriched ^{13}C targets at the Van de Graaff facility/Australian National University. Two surface-barrier detectors (for (α,α_0)) and two 2.5 cm×5 cm plastic scintillators (for (α,n)) were used to detect particles. Using a dispersion-theory analysis, the J$^\pi$ and partial width values were obtained for 11 states of ^{17}O with E$_x$=9-10 MeV.

1971Co14: ^{13}C(α,α), E=15,18,20 MeV; measured $\sigma(\theta)$; deduced optical model parameters. Enriched targets.

1972Ku19: ^{13}C(α,α), E=26.6 MeV; measured $\sigma(\theta)$.

1973Ku18: ^{13}C(α,α), E=18,19,22,24,25,26.6 MeV; measured σ(E; θ); deduced reaction mechanism.

1973Le28: ^{13}C(α,α), E=15-25 MeV; measured σ(E; θ). ^{17}O deduced resonances.

1974Ku15: ^{13}C(α,α), E=26.6 MeV; measured $\sigma(\theta)$.

1987Ab03: ^{13}C(α,α), E=48.7,54.1 MeV; deduced model parameters. ΔE-E telescopes. Optical model analyses.

1990Mu19: ^{13}C(α,α), E=65 MeV; analyzed $\sigma(\theta)$; deduced model parameters. Microscopic overlap integrals, vertex form factors.

1993AtZZ: ^{13}C(α,α),(α,α'), E=54.1,104,155 MeV; measured σ(E,θ); deduced model parameters. Coupled-channels analysis.

2012PrZY: ^{4}He(^{13}C,α), E=20.0,25.0,30.0,33.0,35.0 MeV; measured thick target reaction products. ^{17}O deduced yield vs E*, resonances.

2014My05: ^{4}He(^{13}C,^{13}C), E=1.75 MeV/nucleon; measured reaction products, E$_\alpha$, I$_\alpha$. ^{17}O; deduced $\sigma(\theta)$.

Theory:

1971Te10: ^{13}C(α,α), E=20,25 MeV; analyzed interference between states of transferred nucleus.

1974Ch58: ^{13}C(α,α), E=26.6 MeV; analyzed $\sigma(\theta)$.

1977Sa19: ^{13}C(α,α), E=40.5 MeV; calculated $\sigma(\theta)$ at forward angles.

1978Ze03: ^{13}C(α,α), E=26.6 MeV; calculated $\sigma(\theta)$.

1983Go27: ^{13}C(α,α), E=26.6 MeV; calculated $\sigma(\theta)$; deduced spin-orbit potential effects.

1987Le29: ^{13}C(α,α), E(cm)=1.59-4.34 MeV; analyzed, compiled data.

1988Le05: ^{13}C(α,α), E not given; calculated resonances, Γ. Optical model.

1991Le33: ^{13}C(α,α), E=1.5-10 MeV; compiled, reviewed backscattering σ data; deduced regions for ion-beam, depth profiling analyses.

1996Le06: ^{17}O; calculated levels using parameters for ^{13}C+α cluster system. Semi-microscopic algebraic cluster model.

2010DaZY: ^{13}C(α,α),(α,α'), E=388 MeV; calculated $\sigma(\theta)$; deduced radii for specified excited states.

2011Og09: ^{13}C(α,α), E(cm)<300 MeV; analyzed $\sigma(\theta)$ and difraction radii data; deduced abnormally large radii for excited states.

2011Og10: ^{13}C(α,α),(α,α'), E(cm)=388 MeV; analyzed $\sigma(\theta)$; deduced rms radii, diffraction radii, neutron halos in the excited states. Modified diffraction model.

^{17}O Levels

E(level)†	J$^\pi$	Γ	E$_\alpha$(res) (keV)	Comments
7972‡	1/2$^-$‡	69‡ keV	2110	E(level): from E$_\alpha$=2110 keV. Γ: from Γ$_{lab}$=90 keV with Γ$_\alpha$/Γ=0.03.
8066‡	3/2$^+$‡	84‡ keV	2233	E(level): from E$_\alpha$=2233 keV. Γ: from Γ$_{lab}$=110 keV with Γ$_\alpha$/Γ=0.05.
8199‡	3/2$^-$‡	64‡ keV	2407	E(level): from E$_\alpha$=2407 keV. Γ: from Γ$_{lab}$=84 keV with Γ$_\alpha$/Γ=0.11.
8334‡	1/2$^+$‡	8‡ keV	2583	E(level): from E$_\alpha$=2583 keV. Γ: from Γ$_{lab}$=11 keV with Γ$_\alpha$/Γ=0.44.
8395‡	5/2$^+$‡	5‡ keV *2*	2663	E(level): from E$_\alpha$=2663 keV.

Continued on next page (footnotes at end of table)

$^{13}C(\alpha,n),(\alpha,\alpha)$ 1965Ba32,1968Ke02 (continued)

^{17}O Levels (continued)

E(level)[†]	J^{π}	Γ	E_{α}(res) (keV)	Comments
				Γ: from Γ_{lab}=7 keV *2* with Γ_{α}/Γ=0.08.
8461[‡]	7/2+[‡]	8[‡] keV	2750	E(level): from E_{α}=2750 keV. Γ: from Γ_{lab}=10 keV with Γ_{α}/Γ=0.97.
8500[‡]	5/2−[‡]	5.0[‡] keV *15*	2800	E(level): from E_{α}=2800 keV. Γ: from Γ_{lab}=6.7 keV *20* with Γ_{α}/Γ=0.26.
8681[‡]	3/2−[‡]	52[‡] keV	3037	E(level): from E_{α}=3037 keV. Γ: from Γ_{lab}=68 keV with Γ_{α}/Γ=0.06.
8874[‡]	3/2+[‡]	99[‡] keV	3290	E(level): from E_{α}=3290 keV. Γ: from Γ_{lab}=130 keV with Γ_{α}/Γ=0.50.
8886[‡]	7/2−[‡]	6[‡] keV	3305	E(level): from E_{α}=3305 keV; not observed in $^{13}C(\alpha,n)$. Γ: from Γ_{lab}=8 keV with Γ_{α}/Γ=1.00.
8947[‡]	7/2−[‡]	23[‡] keV	3385	E(level): from E_{α}=3385 keV. Γ: from Γ_{lab}=30 keV with Γ_{α}/Γ=0.04.
9142[#]	1/2−[#]	6[#] keV	3640	E(level): from E_{α}=3640 keV. Γ: See also Γ_{α}/Γ=0.45 (1968Ke02).
9180[#]	7/2−[#]	3[#] keV	3690	E(level): from E_{α}=3690 keV; observed via $^{13}C(\alpha,\alpha_0)$ only. Γ: See also Γ_{α}/Γ=0.98 (1968Ke02).
9203[#]	5/2+[#]	5.5[#] keV	3720	E(level): from E_{α}=3720 keV. Γ: See also Γ_{α}/Γ=0.20 (1968Ke02).
9501[#]	5/2−[#]	15[#] keV	4110	E(level): from E_{α}=4110 keV. Γ: See also Γ_{α}/Γ=0.85 (1968Ke02).
9723[#]	7/2+[#]	16[#] keV	4400	E(level): from E_{α}=4400 keV. Γ: See also Γ_{α}/Γ=0.70 (1968Ke02).
9738[#]	3/2+[#]	61[#] keV	4420	E(level): from E_{α}=4420 keV. This level is associated with E_x=9786 keV in Adopted Levels. Γ: See also Γ_{α}/Γ=0.90 (1968Ke02).
9861[#]	9/2+[#]	12[#] keV	4580	E(level): from E_{α}=4580 keV. Γ: See also Γ_{α}/Γ=0.18 (1968Ke02). J^{π}: A doublet was populated and identified as $J^{\pi}=9/2^{+}$. Two levels were subsequently identified with $(5/2^{-})$ and $(1/2^{-})$.
9952[#]	7/2+[#]	107[#] keV	4700	E(level): from E_{α}=4700 keV. Γ: See also Γ_{α}/Γ=0.78 (1968Ke02). J^{π}: Associated with 9976 keV: $5/2^{+}$ level in Adopted Levels.
10136[#]	5/2+[#]	138[#] keV	4940	E(level): from E_{α}=4940 keV. Γ: See also Γ_{α}/Γ=0.85 (1968Ke02).
10167[#]	7/2−[#]	46[#] keV	4980	E(level): from E_{α}=4980 keV. Γ: See also Γ_{α}/Γ=0.15 (1968Ke02).
10243[#]	7/2+[#]	122[#] keV	5080	E(level): from E_{α}=5080 keV. Γ: See also Γ_{α}/Γ=0.60 (1968Ke02).
10320[#]	(7/2)[#@]		5180	E(level): from E_{α}=5180 keV.
10411[#]		≤20[#] keV	5300	E(level): from E_{α}=5300 keV.
10488[#]	(5/2)[#@]	75[#] keV *30*	5400	E(level): from E_{α}=5400 keV.
10579[#]	(7/2,9/2)[#@]	45[#] keV *20*	5520	E(level): from E_{α}=5520 keV.
10625?[#]			(5580)	E(level): from E_{α}=(5580) keV.
10702[#]	(7/2+)[#&]	≤25[#] keV	5680	E(level): from E_{α}=5680 keV; observed via $^{13}C(\alpha,\alpha_0)$ only.
10778[#]	(5/2)[#@]	75[#] keV *30*	5780	E(level): from E_{α}=5780 keV.
10916[#]	≥3/2[#@]	60[#] keV *20*	5960	E(level): from E_{α}=5960 keV.
11046[#]			6130	E(level): from E_{α}=6130 keV.
≈11252?[#]			≈(6400)	E(level): from E_{α}=(≈6400) keV.

Continued on next page (footnotes at end of table)

^{13}C(α,n),(α,α) 1965Ba32,1968Ke02 (continued)

^{17}O Levels (continued)

† Level energies are deduced using E_{α}(res) and ^{13}C, ^{4}He and ^{17}O mass excesses from (2021Wa16: AME-2020) where E_{α}(res) is listed. $E_x=S(\alpha)+M(^{13}C)/(M(^{4}He)+M(^{13}C))*E_{\alpha}(res)$.
‡ From (1965Ba32) where $\Gamma_n+\Gamma_{\alpha}=\Gamma$.
# From (1968Ke02). No states overlapping with those of (1965Ba32) were reported.
@ Tentative assignments from ^{13}C(α,n) angular distribution data.
& Inferred from comparison of elastic yield with calculated level shapes.

^{13}C(^{6}Li,d) 1978Ar15

1970Be31: The ^{13}C(^{6}Li,d) and ^{13}C(^{7}Li,t) reactions were studied at the University of Pennsylvania tandem accelerator using 18-MeV ^{6}Li and 17-MeV ^{7}Li ion beams bombarding a self-supporting, 60±14 μg/cm^2 thick ^{13}C target. Reaction deuterons and tritons were momentum analyzed in a spectrograph over an angular range θ=3.75°−172.5°. Fifteen energy levels below E_x=8.5−MeV were deduced from the angular distributions. Transitions to negative-parity states at E_x=3.06, 3.85, and 4.55 MeV are the strongest when compared with those from the ^{12}C(^{7}Li,t) and ^{12}C(^{6}Li,d) reactions leading to the first K=0, ^{16}O rotational band. Strong transitions were also observed at E_x=7.38, (8.46,8.49), (8.87,8.95), and (9.14,9.20) MeV.

1970Go29: Beam of ^{6}Li/^{7}Li from the cyclotron of the Kurchatov Atomic Energy institute at E=25.6 MeV/30.1 MeV impinged on a self-supporting carbon foil (0.4 mg/cm^2, 75% ^{13}C isotope enriched). The reaction products were detected and identified with a ΔE/ΔX-E counter telescope. The energy spectra were analyzed using a multidimensional analyzer. The angular distributions of deutrons were obtained at θ=0°−45°. States at ^{17}O*(0,0.87,3.06,3.85,4.56,7.56,8.88 MeV) were observed. The group of levels in the energy range E_x=5.0-6.4 MeV were masked by the ^{12}C impurity in the target and not observed. The J^π value of the ^{17}O*(7.56 MeV) state was determined as 9/2$^-$. The hypothesis of the weak binding of the four particles in the sd shell and of several holes in the p shell is confirmed.

1978Ar15: E(^{6}Li)=26, 29, and 34 MeV ion beams bombarded a 0.1-0.35 mg/cm^2 carbon film (70% ^{13}C, 30% ^{12}C) at the Kurchatov Insititute of Atomic Energy. Deuterons were measured by a ΔE/ΔX-E telescope that was placed at θ_{lab}=8° with respect to the beam direction. Alpha particles were detected by 4 surface-barrier detectors (≈100 μ thick). A series of excited states of ^{17}O with large reduced α-particle widths was found.

1978Cl08: An ion beam of ^{6}Li or ^{7}Li at E=34, 36 MeV, produced at the Florida State University/FN tandem Van de Graaff accelerator, impinged on 100 μg/cm^2 thick ^{13}C targets (enriched 99%). A ΔE-E telescope was used to detect particles with a subtended angle θ=0.2° with resolution 85 keV for tritons and 75 keV for deuterons. Angular distributions were measured at θ=5.0°−31.5°. Strongly populated excited levels of ^{17}O*(13.58 *2*: suggested J^π=11/2$^-$ or 13/2$^-$ or both,14.86,18.17,19.24 MeV) were observed.

1982Ta23: ^{13}C(^{6}Li,d), E=36,32,28 MeV; measured yield vs particle energy, $\sigma(\theta)$, fusion σ, breakup σ vs E; deduced reaction mechanism. Optical, simple breakup model analyses.

1984Ca39: The ^{13}C(^{6}Li,d)^{17}O*→α+^{13}C reaction was studied at the FN9 tandem Van de Graaff/the Centre d'Etudes Nucleaires de Saclay with an incident energy of E(^{6}Li)=34 MeV and a self-supporting, 157 μg/cm^2 thick ^{13}C target. Deuterons were detected by a ΔE-E Si telescope placed at θ_{lab}=10° and the coincident α-particles were recorded by two ΔE-E Si telescopes covering the angular range 20°<θ_{lab}<157.5°. The excitation energies of ^{17}O*(8.47, 8.92, 9.87, 13.6, 14.25, 14.95, 16.1, 18.3 and 19.6 MeV) were recognized.

1998Mu12: ^{13}C(^{6}Li,X), E(cm)=2.07-8.23 MeV; measured Eγ, Iγ; deduced partial, total fusion σ. Statistical model analysis, Optical model, Incoming Wave Boundary Condition model and one-dimensional Barrier Penetration model calculations.

2003Ka51,2003Ku03,2003Ku36: ^{13}C(^{6}Li,d), E=60 MeV; measured deuteron spectra, σ(E,θ); deduced spectroscopic factors, subthreshold state contribution, optical potential parameters.

2012La29: XUNDL dataset compiled by TUNL, 2012.

A beam of E=7.82 MeV ^{6}Li ions impinged on a 53 μg/cm^2 *99*% enriched ^{13}C target at the Florida State University accelerator facility. An array of five 5 cm×1 cm position sensitive Si detectors measured ^{16}O and deuterons from the reaction.

Three broad groups, corresponding to ^{17}O*(6356), ^{17}O*(7165,7248) and ^{17}O*(7378,7381) are populated in the reaction. Data are analyzed via an R-matrix analysis; the parameters of the higher-lying states are adjusted to reproduce values given in 2008He11. The Asymptotic Normalization Constant, ANC=$6.7^{+0.9}_{-0.6}$ fm^{-1} is deduced for the 6356 keV J^π=1/2$^+$ state. Discussion on the astrophysical reaction rate and impact of the E_x=6356 keV (α,n) subthreshold resonance is given.

Theory:

2003Ke10: ^{13}C(^{6}Li,d), E=60 MeV; analyzed σ(E,θ). ^{17}O deduced spectroscopic factors. DWBA and coupled reaction channels analysis, comparison with previous results, astrophysical implications discussed. See also (2018Ke03).

$^{13}C(^{6}Li,d)$ 1978Ar15 (continued)

^{17}O Levels

E(level)[†]	J^{π}[‡]	Γ[‡]	L[‡]	Comments
0			3[#]	
871			1[#]	
3055	(1/2$^-$)		0	L: See also (1970Go29,2003Ka51,2003Ku03).
3843	(5/2$^-$)		2	L: See also (1970Go29,2003Ka51,2003Ku03).
4554	(3/2$^-$)		2	L: See also (1970Go29,2003Ka51,2003Ku03).
5085				
5216				
5697				Unresolved (1970Be31,2003Ka51,2003Ku03,2003Ku36).
5733				Unresolved (1970Be31,2003Ka51,2003Ku03,2003Ku36).
5869				Unresolved (1970Be31).
5939				Unresolved (1970Be31).
6356		83 keV *+9−12*	1[@]	Γ≈83 keV *+9−12*, $\Gamma\approx\Gamma_n$ (2012La29). ANC^2=6.7 fm^{-1} *+9−6* (2012La29). The results of (2003Ka51,2003Ku03,2003Ku36) indicate S_α(6.356)/S_α(3.055)=0.044. See also S_α=0.36-0.40 for N=4 (2003Ke10: calculated values in Table 3).
6862				
6972				
7165[&]	5/2$^-$[&]	1.88[&] keV		Γ_n=1.88 keV Unresolved (2003Ka51,2003Ku03,2003Ku36).
7248[&]	3/2$^+$[&]	340[&] keV		Γ_n=340.1 keV; Γα=0.14 keV Unresolved (2003Ka51,2003Ku03,2003Ku36).
7378[&]	5/2$^+$[&]	0.42[&] keV		Γ_n=0.41 keV; Γα=0.011 keV
7381[&]	5/2$^-$[&]	1.77[&] keV	(4)	Γ_n=1.77 keV J^π: See also (9/2$^-$)? (1978Ar15).
7559				
7576	9/2$^-$[a]		4[a]	
7688				Unresolved (1970Be31,1978Cl08).
7757				Unresolved (1970Be31,1978Cl08).
8200				
8466	7/2$^+$	7 keV *3*	3	Unresolved (1970Be31,1978Cl08).
8501				Unresolved (1970Be31,1978Cl08).
8687				
8885	7/2$^-$	6 keV	4	Unresolved (1970Be31).
8897			4[a]	Unresolved (1970Be31,1978Cl08).
8967				Unresolved (1970Be31,1978Cl08).
9150				Unresolved (1970Be31).
9180	7/2$^-$	3 keV	4	Unresolved (1970Be31).
9877				
9976	7/2$^+$	107 keV	3	
10168	5/2$^+$	138 keV	3	
11815				
12400				
13300?				
13.58×10^3[b] *2*	(11/2$^-$,13/2$^-$)[ab]	200 keV	6	Γ: From (1978Ar15). E(level): See also 13.6 MeV *1* (1978Ar15). J^π: 13/2$^-$ is preferred in (1978Ar15) based on expected systematics.
14.15×10^3[‡] *10*	(9/2$^+$,11/2$^+$)	200 keV	5	J^π: (11/2$^+$) is slightly preferred in (1978Ar15).
14760				
15.1×10^3[‡] *1*	(9/2$^+$,11/2$^+$)	0.38 MeV *15*	5	E(level): 15.0 MeV *1* at E(^{6}Li)=26 MeV, 15.15 MeV *15* at E(^{6}Li)=29 MeV.

Continued on next page (footnotes at end of table)

$^{13}C(^{6}Li,d)$ 1978Ar15 (continued)

^{17}O Levels (continued)

E(level)†	Jπ‡	Γ‡	L‡	Comments
				Γ: 0.37 MeV *15* at E(^{6}Li)=26 MeV, 0.40 MeV *15* at E(^{6}Li)=29 MeV. Jπ: 11/2+ is preferred in (1978Ar15).
15.95×10^{3}‡ *15*	(9/2+,11/2+)	4.0×10^{2} keV *15*	5	Jπ: 9/2+ is preferred in (1978Ar15).
16.60×10^{3}‡ *15*	(11/2−,13/2−)		6	Jπ: 11/2− is preferred in (1978Ar15).
17.10×10^{3}‡ *15*	(11/2−,13/2−)		6	Jπ: 11/2− is preferred in (1978Ar15).
19.60×10^{3}‡ *15*	(13/2+,15/2+)	250 keV	7	Jπ: 15/2+ is preferred in (1978Ar15).
20.20×10^{3}‡ *15*	(13/2+,15/2+)	250 keV	7	Jπ: 15/2+ is preferred in (1978Ar15).
21.2×10^{3}‡	(13/2+,15/2+)		7	Jπ: 13/2+ is preferred in (1978Ar15).
22.1×10^{3}‡				

† Observed in (1970Be31, 1970Go29, 1978Ar15, 1978Cl08, 1984Ca39, 2003Ka51, 2003Ku03, 2003Ku36). See nominal level energy values listed in, for example, (1978Cl08).
‡ From (1978Ar15) except where noted.
# From (1970Go29,2003Ka51,2003Ku03).
@ From (2003Ka51,2003Ku03).
& Populated in (2012La29) using values from (2008He11). Γ_n, $\Gamma\alpha$ are also from (2008He11).
a From (1970Go29).
b From (1978Cl08).

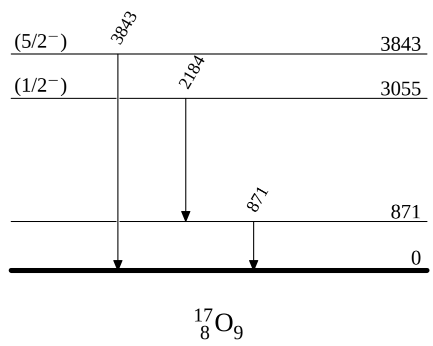
$\gamma(^{17}O)$

E_γ†	E_i(level)	J_i^π	E_f
871	871		0
2184	3055	(1/2−)	871
3843	3843	(5/2−)	0

† See (1998Mu12).

$^{13}C(^{6}Li,d)$ 1978Ar15

Level Scheme



^{13}C(^{7}Li,t) 1978Cl08

1970Be31: The ^{13}C(^{6}Li,d) and ^{13}C(^{7}Li,t) reactions were studied at the University of Pennsylvania tandem accelerator using 18-MeV ^{6}Li and 17-MeV ^{7}Li ion beams bombarding a self-supporting, 60±14 μg/cm^{2} thick ^{13}C target. The deuterons and tritons were momentum-analyzed in a miltiangle spectrograph over an angular range θ=3.75°−172.5°. Fifteen energy levels below E_x=8.5 MeV were deduced from the angular distributions. Transitions to the negative-parity states at E_x=3.06, 3.85, and 4.55 MeV are the strongest observed. Comparison with those from the ^{12}C(^{7}Li,t) and ^{12}C(^{6}Li,d) reactions resolves the first K=0, ^{16}O rotational band. Strong transitions were also observed at E_x=7.38, (8.46,8.49), (8.87,8.95), and (9.14,9.20) MeV.

1970Go29: Beams of E=25.6 MeV/30.1 MeV ^{6}Li/^{7}Li ions from the Cyclotron of the Kurchatov Atomic Energy Institute at impinged on a self-supporting carbon foil (0.4 mg/cm^{2}, 75% ^{13}C isotope enriched). The reaction products were detected and identified with a ΔE/ΔX-E counter telescope. The energy spectra were analyzed using a multidimensional analyzer. The angular distributions of the deutrons were obtained at θ=0°−45°. Excitated states of ^{17}O*(0,0.87,3.06,3.85,4.56,7.56,8.88 MeV) were observed. The group of levels in the energy range E_x=5.0-6.4 MeV were masked by the ^{12}C impurity in the target and not observed. The J^{π} value of the ^{17}O*(7.56 MeV) state was determined as $9/2^{-}$. The hypothesis of the weak binding of the four particles in the sd shell and of several holes in the p shell is confirmed.

1971Sc21: The reactions ^{12}C(^{7}Li,d) and ^{13}C(^{7}Li,t) were studied at E_{cm}=13.3 MeV using a lithium beam from the E(n)-tandem-van-de-Graaff-Accelerator of the Max-Planck-Institut, impinged on a ^{13}C target (50% ^{13}C, 50% ^{12}C and ^{16}O). The reactions products were identified by the ΔE-E information. The overall resolutions for deutrons was about 90 keV.

The integrated cross sections σ_{int} were measured in both reactions. Spin assignments were extracted from σ_{int} in the reaction ^{12}C(^{7}li,d) and a modified DWBA code was used to analyze the reaction ^{13}C(^{7}Li,t). Energy levels and J^{π} values of ^{17}O were deduced.

1978Cl08: Ion beams of ^{6}Li or ^{7}Li at E=34, 36 MeV, produced at the Florida State University/FN tandem Van de Graaff accelerator, impinged on 100 μg/cm^{2} thick ^{13}C targets (enriched 99%). A telescope consisting of a ΔE and a Si(Li)E detector was used to detect particles with a subtended angle θ=0.2° with resolution 85 keV for tritons and 75 keV for deuterons. Angular distributions were measured at θ=5.0°−31.5°. Strongly populated excited levels of ^{17}O*(13.58 *2*: suggested $J^{\pi}=11/2^{-}$ or $13/2^{-}$ or both,14.86,18.17,19.24 MeV) were observed.

1982Ta23: ^{13}C(^{7}Li,t), E=36,32,28 MeV; measured yield vs particle energy, $\sigma(\theta)$, fusion σ, breakup σ vs E; deduced reaction mechanism. Optical, simple breakup model analyses.

2008Pe09: The ^{13}C(α,n)^{16}O reaction was investigated through the direct α transfer reaction ^{13}C(^{7}Li,t). The experiment was performed at the Orsay Tandem using a $^{7}Li^{3+}$ beam at E=28, 35 MeV to bombard a self-supporting, 90% enriched ^{13}C target (72(4) or 133(7) μg/cm^{2}). The reaction products were analyzed with an Enge split-pole spectrometer and detected and identified by a position-sensitive gas chamber and a ΔE proportional gas counter. The tritons were detected at θ=0°−31°. Differential cross sections of ^{17}O*(3.055,4.55,6.356,7.37 MeV) states were measured and comapred with finite-range DWBA calculations. The spectroscopic factor, ANC (asymptotic normalization factor) and the α width of ^{17}O*(6.356 MeV:$1/2^{+}$) subthreshold state were deduced using DWBA analysis. The result confirms that the contribution of the $1/2^{+}$ state is dominant at astropysical energies. See also (2007PeZZ).

2020Me09: The authors analyzed ^{17}O states populated in the ^{13}C(^{7}Li,t) reaction to evaluate the ^{17}F analog states that may influence stellar ^{13}N(α,p) reaction rates.

A beam of 34 MeV ^{7}Li ions, from the Tandem-ALTO facility at Orsay, impinged on a 90% ^{13}C enriched 80 μg/cm^{2} carbon target. Tritons from reactions in the target were momentum analyzed for $\theta_{lab.}$=0°−33° using an Enge Split-Pole spectrometer. Angular distributions were analyzed via finite-range DWBA for states within E_x=5.6-7.7 MeV.

Spectroscopic factors and Γ_{α} widths were deduced. Using this information the analog states in ^{17}F are evaluated and the ^{13}N(α,p)^{16}O astrophysical reaction rate is obtained using the AZURE2 R-matrix code and found within a factor of two in comparison of previous estimates. Resonances at $E_{c.m.}(\alpha)$=221, 741 and 959 keV (^{17}F*(6039,6560,6778 keV)) are found to contribute the most uncertainty to the reaction rate.

$^{13}C(^7Li,t)$ 1978Cl08 (continued)

^{17}O Levels

$\Gamma\alpha$: From (2020Me09) except where noted.

E(level)[†]	J^π[‡]	$T_{1/2}$	L[#]	C^2S_α[b]	Comments
0	5/2		3		
870	1/2		1		
3055	1/2		0		S_α=0.32 at $E(^7Li)$=34 MeV, S_α=0.22 at $E(^7Li)$=28 MeV (2008Pe09).
3850	5/2		2		
4553	3/2		2		S_α=(0.10 *5*) (2008Pe09).
5080					
5220	7/2				
5690			4[a]	0.014	Unresolved (1970Be31,1971Sc21,1978Cl08).
5720			2[a]		Unresolved (1970Be31,1971Sc21,1978Cl08).
5870	5/2		1[a]		Unresolved (1970Be31,1971Sc21).
5940	1/2		0[a]	0.19	Unresolved (1970Be31,1971Sc21).
6356			1[a]	0.29	S_α=0.29 *11*, ANC^2=4.5 fm^{-1} *22* and γ^2_α (reduced α width)=13.5 keV *66* from (2008Pe09).
6870	7/2		3[a]	0.012	$\Gamma\alpha=0.11\times10^{-3}$ eV
6990	5/2		4[a]	0.020	$\Gamma\alpha=0.082\times10^{-3}$ eV
7170	5/2		2[a]	0.12	$\Gamma\alpha$=3.4 eV
7202			1[a]	0.24	$\Gamma\alpha$=73 eV E(level): from (1993Ti07). Γ_n=400 keV, Γ_α=0.09 keV (2008Pe09) which are consistent with the ^{16}O+n measurement in (1966Li03: Γ_n/Γ>0.99).
7379[&]	9/2		3[a]	0.16[&]	$\Gamma\alpha$=8.0 eV
7382[&]			2[a]	0.42[&]	$\Gamma\alpha$=131 eV
7560	$9/2^-$[#]		4		J^π: See also 9/2 (1971Sc21).
7576	$(7/2^+)$	<0.1 keV	3[a]	0.029	$\Gamma\alpha$=7.3 eV E(level): From (2020Me09).
7690	(3/2,7/2,3/2)		4[a]	0.12	$\Gamma\alpha$=3.3 eV Unresolved (1970Be31,1978Cl08).
7750					Unresolved (1970Be31,1978Cl08).
8400	5/2				Unresolved (1971Sc21).
8470	9/2				Unresolved (1970Be31,1971Sc21,1978Cl08).
8510	5/2				Unresolved (1970Be31,1971Sc21,1978Cl08).
8679					
8873	3/2				Unresolved (1970Be31,1971Sc21).
8884	7/2		4		Unresolved (1970Be31,1971Sc21,1978Cl08).
8945	7/2				Unresolved (1970Be31,1971Sc21,1978Cl08).
9147					
9150					Unresolved (1970Be31).
9180					Unresolved (1970Be31).
9500					
9730					
9880					Unresolved (1971Sc21).
9950					Unresolved (1971Sc21).
10560					
10780					
11750					
11820					
12400					
13300?					
13580[@] *20*	$(11/2^-,13/2^-)$[#@]				

Continued on next page (footnotes at end of table)

$^{13}C(^{7}Li,t)$ 1978Cl08 (continued)

^{17}O Levels (continued)

E(level)[†]
14600
14860
18170
19240

[†] Observed in (1970Be31, 1970Go29, 1971Sc21, 1978Cl08, 2008Pe09). See nominal level energy values listed in, for example, (1978Cl08).
[‡] From (1971Sc21) except where noted.
[#] From (1970Go29), except where noted.
[@] From (1978Cl08).
[&] Unresolved, the spectroscopic factor assumes all strength is in one state or the other.
[a] From (2020Me09).
[b] From (2020Me09).

^{13}C(^{9}Be,αn),(^{9}Be,^{5}He) 1984Da17,1986Cu02

1984Da17: ^{13}C(^{9}Be,αn),(^{9}Be,^{5}He)^{17}O, E=1.2-5.2 MeV; measured σ(E), γ yields; deduced no evidence for the ^{13}C(^{9}Be,^{5}He)^{17}O transfer process in the ^{17}O+nα channels.

1986Cu02: ^{13}C(^{9}Be,αn)^{17}O, E(cm)≈2-5 MeV; measured E_γ, I_γ, γ, residual production σ(E). ^{17}O deduced transitions. Statistical model, α-transfer, DWBA analyses. Enriched targets, Ge detectors.

See also (2019Xu05: theory).

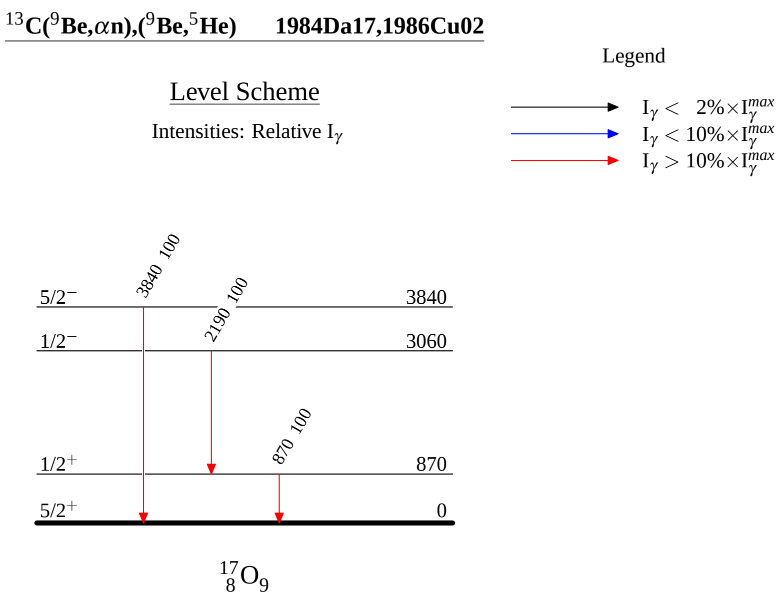
^{17}O Levels

E(level)†	J$^\pi$†	l_α‡	Comments
0	5/2$^+$		Q=3.89 MeV (1984Da17,1986Cu02).
870	1/2$^+$	1	Q=3.02 MeV (1984Da17).
3060	1/2$^-$	0	Q=0.83 MeV (1984Da17).
3840	5/2$^-$	2	Q=0.05 MeV (1984Da17).

† From (1984Da17,1986Cu02).
‡ The angular momentum of the transferred α-particle (1986Cu02).

γ(^{17}O)

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π
870	100	870	1/2$^+$	0	5/2$^+$
2190	100	3060	1/2$^-$	870	1/2$^+$
3840	100	3840	5/2$^-$	0	5/2$^+$



^{13}C(^{11}B,^{7}Li) 2012Gu18,2017Me04

2012Gu18: The angular distribution for the reaction ^{13}C(^{11}B,^{7}Li)^{17}O was measured at the HI-13 tandem accelerator of the China Institute of Atomic Energy in Beijing. A beam of E(^{11}B)=50 MeV impinged on a self-supporting ^{13}C target (75 *6* μg/cm^2, 8% purity). The reaction products were separated by a Q3D magnetic spectrograph and detected by a two-dimensioanl position-sensitive Si detector PSSD.

Excitation states of ^{17}O*(3.055,3.843,4.554,6.356 MeV) were observed. The α-spectroscopic factor S_α=0.37 *12*, the square of the Coulomb modified ANC (asymptotic normalization coefficient), C^2 or ANC^2=4.0 fm^{-1} *11*, and the reduced α-width γ_α^2=12.7 keV for the ^{17}O*(6.356 MeV; 1/2$^+$) subthreshold state were deduced.

2017Me04: XUNDL dataset compiled by TUNL, 2017.

The authors measured the angular distributions of $^{11}\beta^+$ ^{13}C elastic and inelastic scattering and deduced α spectroscopic factors of ^{17}O states.

A beam of 45 MeV ^{11}B ions, from the Warsaw cyclotron facility, impinged on a carbon foil target (90% ^{13}C). The reaction products were detected at $\theta_{cm}\approx12°-175°$ using ΔE-E telescopes. The $^{11}\beta^+$ ^{13}C elastic and inelastic scattering to ^{17}O states with E_x=(0,871,3055,3843,4554,6356) were observed.

The data were analyzed using optical model (OM) and the coupled-channels Born approximation (CCBA) calculations. The α spectroscopic factors of the ^{17}O states were determined. The largest value was for the subthreshold 1/2$^+$ state at E_x=6.356 MeV, either S_α=0.72±0.22 (N=3) or S_α=0.39±0.12 (N=4). The number N is the number of nodes in the α particle radial wave function, not counting the one at the origin (2003Ke10,2008Pe09).

Enhancements were observed in the backward angle scattering for reactions to ^{17}O*(0,871,3055,3843). The authors explored the exotic ^{6}Li cluster transfer mode as an explanation but were still unable to explain the effect.

See also (2018Ke03: theory).

^{17}O Levels

E(level)†	J$^\pi$†	S_α‡	Comments
0	5/2$^+$	0.08 *2*	
871	1/2$^+$	0.35 *12*	
3055	1/2$^-$	0.42 *16*	S_α: =0.19 *6* (2012Gu18).
3843	5/2$^-$	0.10 *3*	S_α: =0.078 *25* (2012Gu18).
4554	3/2$^-$	0.15 *5*	S_α: =0.060 *19* (2012Gu18).
6356	1/2$^+$	0.39 *12*	S_α: for N=4; ANC^2=4.5 fm^{-1} *14*. For N=3, S_α=0.72 *22*; ANC^2=5.1 fm^{-1} *15* (2017Me04). S_α=0.37 *12*; ANC^2=4.0 fm^{-1} *11* (2012Gu18).

† Nominal level energy and J$^\pi$ values listed in (2017Me04).
‡ From (2017Me04).

^{13}C(^{13}C,^{9}Be) 1979Br04

1979Br04: Beams of E(^{13}C)=105 MeV impinged on a self-supporting, 200 μg/cm^2 thick silica solid target (SiO) at the Variable Energy Cyclotron/Atomic Energy Research Establishment, Harwell. The reaction products were detected by a standard counter telescope and were identified by the time-of-flight, ΔE-E technique. ^{17}O levels were deduced and compared with those measured in (1970Be31,1970Go29).

^{17}O Levels

E(level)[†]	Comments
3850	
5220	
5.8×10^3[‡] *1*	E(level): a doublet.
7200	
7600	
8.40×10^3[‡] *6*	
8900	
9.80×10^3[‡] *7*	
10.55×10^3[‡] *6*	
12.10×10^3[‡] *6*	
13.3×10^3[‡]	E(level): Associated with E_x=13.58 MeV in Adopted Levels.
14600	
18.90×10^3[‡] *14*	

† Observed in (1979Br04). See nominal level energy values listed in (1970Be31,1970Go29) except where noted.
‡ From (1979Br04).

$^{13}C(^{17}O,^{17}O)$ 2014Al11

1978Ch03: The angular distributions of the elastic scattering $^{13}C(^{17}O,^{17}O)$ were measured at E_{cm}=12.6-14.0 MeV. An ^{17}O beam from the E(n) Tandem Van de Graaff accelerator of the Weizmann Institute bombarded a 94.6% enriched ^{13}C target with thickness 50 or 100 μg/cm^2. The reaction products were detected and identified by ΔE-E telescopes with 5% resolution and FWHM=450 keV. The cross sections were measured and the optical-model parameters of $^{17}O+^{13}C$ were deduced.
1982He07: $^{13}C(^{17}O,^{17}O)$, E=54-140 MeV; measured $\sigma(\theta)$.

Includes $^{13}C(^{17}O,^{17}O')$.
2014Al11: XUNDL dataset compiled by TUNL, 2014.
The authors carried out measurements of $^{12}C+^{18}O$ and $^{13}C+^{17}O$ elastic and inelastic scattering. The primary aim was to obtain optical model input that was necessary to deduce Asymptotic Normalization Constants for the $^{13}C(^{17}O,^{18}O)$ measurement that was published in (2014Al05).
A beam of 204 MeV ^{17}O ions from the Texas A&M Cyclotron impinged on a 100 μg/cm^2 ^{13}C target (enriched to 99%) that was placed in the scattering chamber of the MDM spectrometer. The scattered recoils were detected at θ_{lab}=4° to 25° with a scattering angle resolution of $\Delta\theta \approx 0.31°$ and a focal plane position resolution better than 1 mm. Low-lying resonances were analyzed and optical model and deformation parameters were deduced.

Theory:
1991Bo12: $^{13}C(^{17}O,^{17}O),(^{17}O,^{17}O')$, E(cm)=18.29 MeV; analyzed $\sigma(\theta)$, $\sigma(E)$. Coupled-channels model.
2018Ay04: $^{13}C(^{17}O,^{17}O)$, E<340 MeV; analyzed available data. ^{17}O; calculated $\sigma(\theta)$; deduced two different density distributions of oxygen isotopes.
1997Ki22: $A(^{17}O,^{17}O)$, E=660-720 MeV/nucleon; calculated reaction σ. Glauber model spherical, deformed Hartree-Fock, comparisons to data. ^{17}O; calculated rms radii related features, mass quadrupole moments, density contours for some nuclei. Hartree-Fock model, SGII force, comparison with experiment.

^{17}O Levels

E(level)	J^π	Comments
0	$5/2^+$	
3843	$5/2^-$	β_2=0.66 *3* (2014Al11) 4p-3h configuration (2014Al11).
6356	$1/2^+$	β_2=0.19 *1* (2014Al11) 3p-2h configuration (2014Al11).

^{14}C(^{3}He,X): res 1972Ke08,1976Ch04

^{14}C(^{3}He,γ):

1972VeZY: ^{14}C(^{3}He,γ), E=3.2-7.4 MeV; measured σ(E; E_γ,$\theta(\gamma)$). ^{17}O deduced resonances, J, π.

1976Ch04: E(^{3}He)=3.2-7.5 MeV ion beams, from the Stanford FN tandem Van de Graaff accelerator, bombarded a thin carbon film (enriched 50% ^{14}C). The γ-rays were detected by a 24×24 cm^2 NaI(Tl) crystal at θ=90° with respect to the incident beam. At some energies, the angular distributions were measured in the range θ=0°−135°. Energy levels at ^{17}O*(21.7 *1*,22.2 *1*,22.6 *2*,23.0 *1*,23.5 *1* and 24.4 *1*) were observed and J$^\pi$ values for the first levels were assigned as 5/2$^+$,7/2$^-$,3/2$^{(-)}$ and 1/2$^+$, respectively.

^{14}C(^{3}He,n):

1961Jo24: ^{14}C(^{3}He,n_0), E=1.6-3.25 MeV; observed two resonances at E(^{3}He)=2.1 and 2.8 MeV, corresponding to ^{17}O*(20.5,21.1 MeV).

1970Ho08: The ^{14}C(^{3}He,n) reaction was investigated using neutron time-of-flight spectrometry by bombarding a ^{14}C target with E(^{3}He)=3.5-6 MeV beams at the University of Alberta/Van de Graaff facility. DWBA calculations were used to analyze angular distributions. Energy levels at ^{16}O*(0, 6.05+6.13, 6.92+7.12 MeV) were observed. A resonance at E_{res}=4.1 MeV was observed in the 0° excitation function of the ^{16}O ground state and the second doublet which implies ^{16}O*(7.12 MeV:1$^-$) state is strongly participating in this region, which corresponds to a level or levels at 22.2 MeV in ^{17}O.

^{14}C(^{3}He,p),(^{3}He,d):

1970KeZY: ^{14}C(^{3}He,p),(^{3}He,d), E=2-7 MeV; measured σ(E; θ). ^{17}O deduced resonances, J, π.

1972Ke08: This experiment was performed at the University of Florida/ Van de Graaff accelerator using E(^{3}He)=2.2-7 MeV ion beams bombarding a ^{14}C target (70% enriched acetylene on 0.10 μm Ni foil). Two solid state detectors (1000 μm and 300 μm thick) placed 15 cm from the target were used to detect the reaction products. The absolute cross sections were obtained with a uncertainty of ±20%. Three levels at ^{17}O*(21.7 MeV *1*, 22.1 MeV *1*, 23.0 MeV *1*) were deduced with J$^\pi$=5/2$^+$, 7/2$^-$, 1/2$^+$, respectively, using a two-level analysis of the α-channel data and an optical-model-plus-resonance (OMPR) analysis of the elastic data.

^{14}C(^{3}He,^{3}He):

1970Du07: ^{14}C(^{3}He,^{3}He), E=4-18 MeV; measured σ(E; θ); deduced optical potential parameters.

1970KeZY: ^{14}C(^{3}He,^{3}He), E=2-7 MeV; measured σ(E; θ). ^{17}O deduced resonances, J, π.

1971Co14: ^{14}C(^{3}He,^{3}He), E=6.0,8.0,10.0 MeV; measured $\sigma(\theta)$; deduced optical model parameters.

1972Ke08: ^{14}C(^{3}He,^{3}He), see above.

^{14}C(^{3}He,α):

1970KeZY: ^{14}C(^{3}He,α), E=2-7 MeV; measured σ(E; θ). ^{17}O deduced resonances, J, π.

1971Co14: ^{14}C(^{3}He,α), E=6.0,8.0,10.0 MeV; measured $\sigma(\theta)$; deduced optical model parameters. Enriched targets.

1971Ke08: A ^{3}He ion beam from the University of Florida 4 MV Van de Graaff accelerator bombarded a ^{14}C target (70% enriched acetylene deposited on a 0.1 μm Ni foil). The α-particle angular distributions, measured in 5° step and covering θ=20°−160°, were fitted using a Legendre polynomial expansion. Two broad states at ^{17}O*(21.7 MeV *1*:5/2$^+$,22.1 MeV *1*:7/2$^-$) with $\Gamma_{cm}\approx$750 keV were obtained in both α_0 and α_1 channels with corresponding E_{res}=3.6 and 4.1 MeV. The 22.1-MeV level is suggested to be a 3p-2h quasi-bound state.

1972Ke08: ^{14}C(^{3}He,α), see above.

Theory:

Differential cross sections are calculated and analyzed in (1986Ze04: E=16-22 MeV), (1989Er05: E=72 MeV), (1990De31: E=39.6,12 MeV), (1992Ga26: E=72 MeV), (1996De49: E=72 MeV), (1996Go14: E(cm)=59,33 MeV), (2014El01: E=37.9 MeV), (2015Pa10: E=4-118.5 MeV; analyzed $\sigma(\theta)$ for 142 sets of experimental data; deduced optical model parameters). See also (1983Me18).

^{17}O Levels

Notes:

(1972Ke08) also report excitation functions in the range E(^{3}He)=2.2-7.0 MeV (α_{0-3}), 3.2-4.4 MeV (p_{0-3}), 3.2-5.5 MeV (d) and 4.0-6.1 MeV (^{3}He): angular distributions for the α-groups have been measured at a number of energies.

For ^{17}O deduced resonances, J, π, see also (1970KeZY,1972VeZY).

The variation of the ^{3}He optical parameters has been studied for E(^{3}He)=10-18 MeV (1970Du07).

$^{14}C(^{3}He,X)$: res 1972Ke08,1976Ch04 (continued)

^{17}O Levels (continued)

(Ke70): Keyser et al., Bull. Amer. Phys. Soc. 15 (1970) 1685.

Continued on next page (footnotes at end of table)

^{14}C(^{3}He,X): res 1972Ke08,1976Ch04 (continued)

^{17}O Levels (continued)

E(level)[†]	Jπ[#]	Γ[@]	E_{res}(lab) (MeV)[&]	Comments
0	5/2+			E(level),Jπ: from Adopted Levels.
871	1/2+			E(level),Jπ: from Adopted Levels.
20.49×10^{3}[‡a]			2.1[‡]	%n>0 E(level): from E(^{3}He)=2.1 MeV (1961Jo24).
21.06×10^{3}[‡ac]			2.8[‡]	%n>0 E(level): from E(^{3}He)=2.8 MeV (1961Jo24).
21.72×10^{3}[&bc] *8*	5/2+	0.75 MeV	3.6 *1*	%IT>0; %α>0 E(level): from E(^{3}He)=3600 keV *100* (1976Ch04). See also E_{res}=3600 keV (Ke70,1971Ke08,1972Ke08).
22.13×10^{3}[&abcde] *8*	7/2−	0.75 MeV	4.1 *1*	%IT>0; %n>0; %α>0 E(level): From E(^{3}He)=4100 keV *100* (1976Ch04). See also E_{res}=4100 keV (Ke70,1970Ho08,1971Ke08,1972Ke08). Jπ: (1970Ho08) however suggests (1/2−,3/2−).
22.54×10^{3}[&bc] *17*	3/2(−)	≈1[&] MeV	4.6 *2*	%IT>0 E(level): from E(^{3}He)=4600 keV *200* (1976Ch04).
22.96×10^{3}[&bf] *8*	1/2+	≈0.4 MeV	5.1 *1*	%IT>0 E(level): from E(^{3}He)=5100 keV *100* (1976Ch04). See also E_{res}=5100 keV (Ke70,1972Ke08).
23.45×10^{3}[&bc] *8*			5.7 *1*	%IT>0 E(level): from E(^{3}He)=5700 keV *100* (1976Ch04).
24.44×10^{3}[&b] *8*			6.9 *1*	%IT>0 E(level): from E(^{3}He)=6900 keV *100* (1976Ch04).

[†] Level energies are deduced using E(^{3}He)(res) and ^{3}He, ^{14}C and ^{17}O mass excesses from (2021Wa16: AME-2020) where E(^{3}He)(res) is listed. E_x=S(^{3}He)+M(^{14}C)/(M(^{3}He)+M(^{14}C))*E(^{3}He)(res).
[‡] From (1961Jo24: ^{14}C(^{3}He,n_0)).
[#] From (1976Ch04: ^{14}C(^{3}He,γ)). See also (1971Ke08: ^{14}C(^{3}He,α), 1972Ke08: ^{14}C(^{3}He,α/d/p/^{3}He), Ke70: ^{14}C(^{3}He,^{3}He/α)).
[@] From (1972Ke08) except where noted.
[&] From (1976Ch04) except where noted.
[a] Observed in (^{3}He,n).
[b] Observed in (^{3}He,γ).
[c] Observed in (^{3}He,α).
[d] Observed in (^{3}He,p).
[e] Observed in (^{3}He,d).
[f] Observed in (^{3}He,^{3}He).

γ(^{17}O)

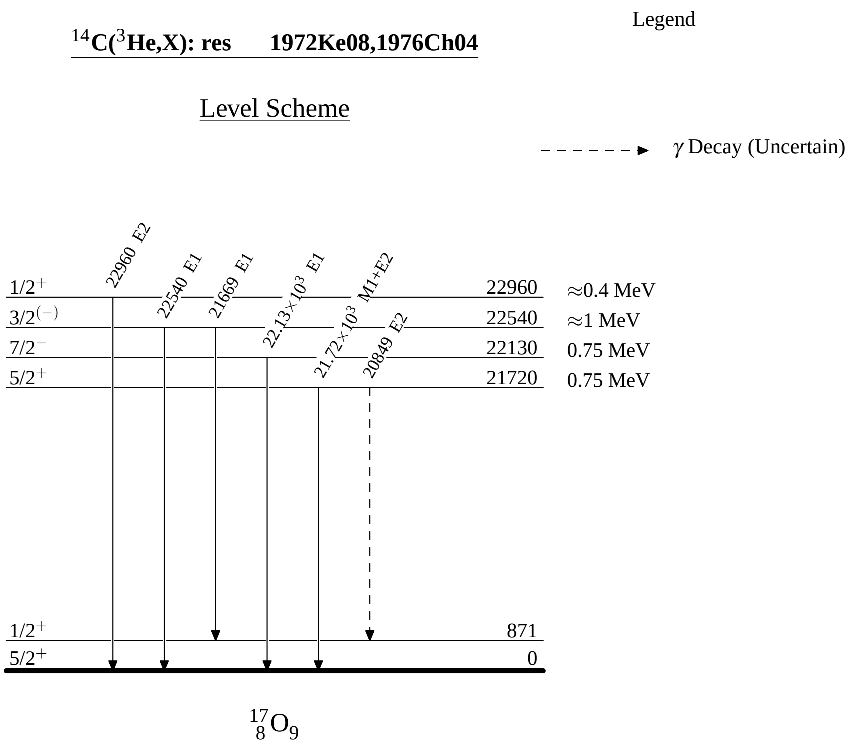
$E_γ$[†]	E_i(level)	$J^π_i$	E_f	$J^π_f$	Mult.[†]	Comments
20849[‡]	21.72×10^{3}	5/2+	871	1/2+	E2	
21669	22.54×10^{3}	3/2(−)	871	1/2+	E1	
21.72×10^{3}	21.72×10^{3}	5/2+	0	5/2+	M1+E2	The integrated E2 strength for 21725 and 22960 states was estimated to be about 1.5% of the E2 sum rule.
22.13×10^{3}	22.13×10^{3}	7/2−	0	5/2+	E1	
22540	22.54×10^{3}	3/2(−)	0	5/2+	E1	
22960	22.96×10^{3}	1/2+	0	5/2+	E2	

Continued on next page (footnotes at end of table)

^{14}C(^{3}He,X): res 1972Ke08,1976Ch04 (continued)

γ(^{17}O) (continued)

† See (1976Ch04).
‡ Placement of transition in the level scheme is uncertain.



^{14}C(α,n) 1964Al11

1956Sa06: ^{14}C(α,n), threshold and reaction energy Q_0 were determined.
1964Al11: ^{14}C(α,n), E=7.0-8.6 MeV; the γ-ray de-excitation of ^{13}C*(3.06,3.85) states were observed in coincidence with neutrons. ^{13}C deduced lifetime, J, π, decay modes.

^{17}O Levels

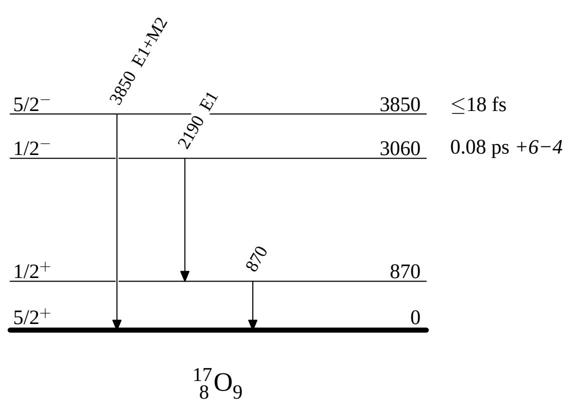
E(level)	J^π	$T_{1/2}$	Comments
0	5/2+		Q_0=1820 keV *2* and the threshold energy is 2340 keV *3*.
870	1/2+		
3060	1/2−	0.08 ps *+6−4*	J^π,$T_{1/2}$: from (1964Al11).
3850	5/2−	≤18 fs	J^π,$T_{1/2}$: from (1964Al11), J^π is favored over 7/2−.

γ(^{17}O)

E_γ	E_i(level)	J^π_i	E_f	J^π_f	Mult.	Comments
870	870	1/2+	0	5/2+		Decay via 3060.
2190	3060	1/2−	870	1/2+	E1	The upper limit to the unobserved decay 3.06→0 is 2%. $\|M\|^2$(E1)=10^{-3} where $\|M\|^2$ is the ratio of the measured radiative width to the single particle estimate.
3850	3850	5/2−	0	5/2+	E1+M2	The upper limit to the unobserved decay 3.85→0.87 is 5%. $\|M\|^2$(E1)≥10^{-3}, $\|M\|^2$(M2)≥1.5.

^{14}C(α,n) 1964Al11

Level Scheme



^{14}C(^{6}Li,t) 1981Cu11

1981Cu11,1983Cu02,1983Cu04: A beam of E(^{6}Li)=34 MeV ions, produced at the Saclay FN-Tandem Van de Graaff, impinged on a 45±9 μg/cm^{2} thick ^{14}C target (70% enriched). The emitted particles were measured and identified by a ΔE-E Si counter telescope over the angular range 5°≤θ_{lab}≤45° in steps of 5°. A triton energy spectrum was detected at θ_{lab}=5° with a overall resolution FWHM≈80 keV.

In (1983Cu02), authors compared the (^{6}Li,t) energy spectra on ^{14}C and ^{16}O targets (1972Pa29: ^{16}O(^{6}Li,t)^{19}Ne at E(^{6}Li)=36 MeV) using a weak coupling hypothesis, and they identifiedstates at 6.36- and 8.89-MeV.

In (1983Cu04), the authors compared (^{6}Li,t) and (^{6}Li,^{3}He) measurements at E(^{6}Li)=34 MeV to identify the analog states of ^{17}N and ^{17}O and to identify 14.76- and 15.2-MeV states.

Excitated states of ^{17}O up to ≈18 MeV were deduced.

^{17}O Levels

E(level)†	J$^{\pi}$†	L‡	C^{2}S (×10^{3})#	Comments
0	5/2^{+}	2		
0.87×10^{3}	1/2^{+}	0		
3.05×10^{3}	1/2^{-}	1		
3.84×10^{3}	5/2^{-}	3		
4.55×10^{3}	3/2^{-}	1		
5.22×10^{3}	9/2^{-}			
5.69×10^{3}	7/2^{-}	3		
6.36×10^{3}	1/2^{+}		4.9@	T=1/2 (1983Cu02)
7.17×10^{3}	5/2^{-}	3		Unresolved.
7.38×10^{3}	5/2^{+}		8.8@	T=1/2 (1983Cu02) Unresolved.
7.75×10^{3}	11/2^{-}	5		
8.20×10^{3}	3/2^{-}	1		
8.47×10^{3}	7/2^{+}	4		Unresolved.
8.89×10^{3}	3/2^{+}		6.3@	T=1/2 (1983Cu02)
9.18×10^{3}	7/2^{-}	3		Unresolved.
9.72×10^{3}	7/2^{+}	4		
9.87×10^{3}	9/2^{+}	4	6.4@	T=1/2 (1983Cu02) Unresolved.
10.43×10^{3}				
11.23×10^{3}				
11.82×10^{3}		3,4		
12.01×10^{3}				
12.27×10^{3}	(7/2^{+})		5.1@	T=1/2 (1983Cu02)
12.99×10^{3}	5/2^{-}		4.8	Unresolved. C^{2}S (×10^{3}): 5.4 for set II.
13.6×10^{3}	5/2^{+}		21.3	Unresolved. C^{2}S (×10^{3}): 27.5 for set II.
14.76×10^{3}	7/2^{-}		8.8	Unresolved. C^{2}S (×10^{3}): 10.5 for set II. For 14.76-MeV; J$^{\pi}$=9/2^{-} state: C^{2}S=4.3×10^{3} for set I and 4.0×10^{3} for set II.
15.20×10^{3}	3/2^{+}		25.6	C^{2}S (×10^{3}): 32.7 for set II.
16.3×10^{3}	9/2^{+}		4.4	T=3/2 (1983Cu02) Unresolved. C^{2}S (×10^{3}): 5.1 for set II, see also (1983Cu02).
18.15×10^{3}				

† From (1981Cu11,1983Cu02,1983Cu04).

Continued on next page (footnotes at end of table)

$^{14}C(^{6}Li,t)$ 1981Cu11 (continued)

^{17}O Levels (continued)

‡ From (1981Cu11).
# Set I from (1983Cu04) except where noted. Estimate absolute uncertainties ±25% (due to statistical errors (≈±10%) and absolute-value uncertainty (≈±20%)).
@ From (1983Cu02).

$^{14}N(t,\gamma)$ **1980Li05**

1980Li05: Triton beams with E=0.8-3.3 MeV, produced by the Strasbourg-Cronenbourg Van de Graaff bombarded a 99.99% purified nitrogen gas cell opperated with 60 cm Hg pressure. Uncertainty in the center-of-target energies are ±25 keV. The γ-ray spectra were recorded with a 25×30 cm NaI(Tl) detector surrounded by a plastic anticoincidence shield. The $^{1}H(t,\gamma)^{4}He$ reaction was used to calibrate the energy scale and to normalize the yeilds. The resolution FWHM for 20.5-MeV γ rays was ≈4%.

Cross sections measured at θ_{lab}=90° resolved the transitions to the 5/2$^+$ ^{17}O ground state (γ_0) and the 1/2$^+$ first excited state (γ_1), separated by 0.87 MeV, but not completely. Excitation energies of ^{17}O*(19.76,20.39,20.58,21.05 MeV) and their J$^\pi$ values were determined. An additional level at E_x≈19.3 MeV was also indicated. The lower limit for the Γ_γ widths range from ≈1-6 eV.

See also (1973LiYQ,1973LiZH) and ^{14}N+t cluster model analysis in (1985Me06).

^{17}O Levels

Γ: From (1980Li05).

E(level)†	J$^\pi$‡	Γ	Comments
0	5/2$^+$		
871	1/2$^+$		
≈19.30×10^3			
19.76×10^3 *6*	3/2$^-$	0.55 MeV *5*	$\Gamma_{\gamma0}\geq$1.0 eV; $\Gamma_{\gamma1}\geq$2.3 eV
20.39×10^3 *5*	5/2$^-$	0.66 MeV *7*	$\Gamma_{\gamma0}\geq$4.3 eV
20.58×10^3 *5*	1/2$^+$	0.57 MeV *8*	$\Gamma_{\gamma1}\geq$5.1 eV
21.05×10^3 *5*	3/2$^-$	0.47 MeV *6*	$\Gamma_{\gamma0}\geq$5.8 eV; $\Gamma_{\gamma1}\geq$6.5 eV

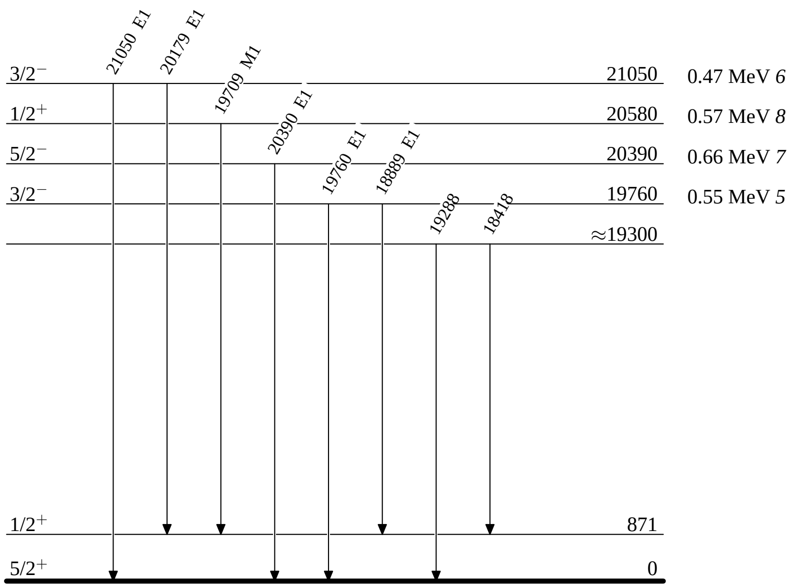
† From (1980Li05).
‡ Best fit (1980Li05).

$\gamma(^{17}O)$

E_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.
18418	≈19.30×10^3		871	1/2$^+$	
18889	19.76×10^3	3/2$^-$	871	1/2$^+$	E1
19288	≈19.30×10^3		0	5/2$^+$	
19709	20.58×10^3	1/2$^+$	871	1/2$^+$	M1
19760	19.76×10^3	3/2$^-$	0	5/2$^+$	E1
20179	21.05×10^3	3/2$^-$	871	1/2$^+$	E1
20390	20.39×10^3	5/2$^-$	0	5/2$^+$	E1
21050	21.05×10^3	3/2$^-$	0	5/2$^+$	E1

^{14}N(t,γ) 1980Li05

Level Scheme



$^{17}_{8}O_9$

^{14}N(α,p),^{4}He(^{14}N,γ^{17}O) 1969Ro07,1969Ba17

1953He58: ^{14}N(α,p), E=1.5-3.5 MeV; measured products, ^{17}O, Eα, l_α; deduced $\sigma(\theta)$.
1961Ya02: ^{14}N(α,p), E=26.8,28.1,33.3 MeV, measured angular distributions.
1967Be30: ^{14}N(α,αp), E=22.9 MeV; deduced nuclear properties.
1969Ba17: ^{14}N(α,αp), E=22.9 MeV; measured $\sigma(E_\alpha,E_p,\theta(\alpha))$. Natural target.
1969Ro07: ^{14}N(α,p), E=13-18 MeV; measured σ(E; Ep,θ) (absolute). ^{17}O deduced levels, J. Natural target.
1969Sc21: ^{14}N(α,p), E=7-12 MeV; measured $\sigma(\alpha,n)/\sigma(\alpha,p)$ ratio, σ(E; Eγ,Ep,θ(p)).
1970Ze01: ^{14}N(α,p), E=10-25 MeV; measured σ(E; Ep,θ); deduced reaction mechanism. ^{17}O levels deduced configurations.
1974Sc09: ^{14}N(α,pγ), E=10 MeV; used Doppler-shift attenuation method (DSA) to deduce $T_{1/2}$ for 0.871 MeV state of ^{17}O.
1975Th01: ^{14}N(α,pγ), measured σ(Eγ).
1987MiZY: ^{14}N(α,p), E=48 MeV; measured σ(Ep). ^{17}O deduced levels.
1988BrZY: ^{14}N(α,p), E=48 MeV; measured not given. ^{17}O deduced levels, J, π.
1992Ar08: ^{14}N(α,p), E=5.2-7.5 MeV; measured $\sigma(\theta)$ vs E. Accurate nitrogen profile determination, TiN, NbTiN films, nitrogen implanted steel.
1994Gi14: ^{14}N(α,p), E=4-5 MeV; measured $\sigma(\theta)$ vs E; deduced elemental composition determination precision features.
1996Gi14: ^{14}N(α,p), E=3.9-5 MeV; measured products, ^{17}O, Eα, Iα; deduced $\sigma(\theta)$.
1999Xu07: ^{14}N(α,p), E=5.6-7.4 MeV; measured products, ^{17}O, Eα, Iα; deduced $\sigma(\theta)$.
2005De54: ^{14}N(α,p), E=4893-6047 keV; measured $\sigma(\theta=172°)$.
2006We05: ^{14}N(α,p), E=3.2-4.0 MeV; measured σ.
2008Te09: ^{14}N(α,p), E=3.5-6 MeV; measured reaction products, Eα, Iα; deduced $\sigma(\theta)$, yields. Comparison with available data.
2017Ko31: ^{4}He(^{14}N,p), E=35.6 MeV; measured reaction products, Eα, Iα; deduced $\sigma(\theta)$.
2018Sm01: A beam of ^{14}N, delivered by the NSCL/ReA3 facility, impinged on a 10^{19} atom/cm^2 ^{4}He gas jet target at the JENSA facility. The scattered α particles and reaction protons, from ^{14}N(α,p) reactions, were momentum analyzed in the SuperORRUBA position sensitive Si barrel array. In addition, a set of 9 2”×2” LaBr$_3$(Ce) scintillator detectors from the HAGRiD array were placed at $\theta_{lab}\approx90°$ and detected coincidence γ rays. A group of $E_\gamma\approx871$ keV photons was obsereved in coincidence with the reaction protons.

Theory:
1962Ga16: Analysis of delayed coincidence lifetime measurements.
2014Ba35: ^{14}N(α,p), analyzed previous σ data by R-matrix. Comparison with previous experimental results, evaluated data, and theoretical calculations.
2015Vo02: ^{14}N(α,p), E=8.674 MeV; calculated reaction probability of nonthermal reaction, effective temperature of non-Maxwellian α particles from ^{7}Li(p,α) reaction. ^{14}N(α,p)^{17}O; calculated forward (p,α) and reverse (α,p) reactivities. Impact on CNO cycles and ^{17}O abundance in standard solar model (SSM).
2017Ch32: ^{14}N(α,p), E not given; analyzed available data; deduced yields.
2017Vo11: ^{14}N(α,p), E<8.7 MeV; calculated probability and rate of suprathermal (α,p) reaction in the CNO cycle, comparative contribution of α particles from ^{7}Li(p,α), ^{3}He(^{3}He,α) reactions and ^{8}B β^+ decay to ^{8}Be* to 2α. Impact on ^{17}O and ^{18}O abundances in the outer core region.

^{17}O Levels

E(level)[†]	J$^\pi$	$T_{1/2}$	L	Comments
0			2	L: from (1961Ya02).
871		170 ps *7*	0,(2)	Γ: from τ=245 ps *10* (1974Sc09). See also τ=434 ps *11* (1962Ga15, 1962Ga16). L: from (1961Ya02).
3058			1	L: from (1961Ya02).
3846			3	L: from (1961Ya02).
4555				
5083				
5217	(7/2,9/2,11/2)			J$^\pi$: from (1969Ro07) on the basis of a possible statistical compound nuclear mechanism and the use of the (2J+1) rule.

Continued on next page (footnotes at end of table)

^{14}N(α,p),^{4}He(^{14}N,γ^{17}O) 1969Ro07,1969Ba17 (continued)

^{17}O Levels (continued)

E(level)†	Comments
5378	
5697	
5729	
5866	
5940	
6380	
6870	
6990	
7167	
7373	
7560	
8460 *70*	E(level): See also 8480 keV *50* (1967Be30: doublet).
8880 *70*	E(level): See also 8910 keV *50* (1967Be30).
9140 *70*	E(level): See also 9170 keV *50* (1967Be30).
9790 *70*	E(level): See also 9840 keV *80* (1967Be30).
10660 *70*	E(level): See also 10700 keV *50* (1967Be30).
12000 *70*	E(level): See also 12050 keV *50* (1967Be30).
12430 *70*	
12740 *70*	
13.57×10^{3} *10*	

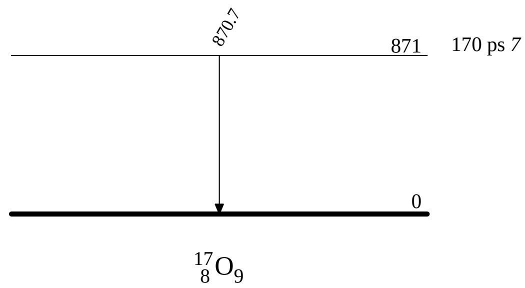
† For $E_x\leq7.6$ MeV: nominal level energy values listed and observed in (1969Ro07). For levels $E_x\geq8.46$ MeV: from (1969Ba17: the sequential decay of ^{14}N(α,αp)^{13}C reaction appears to take place via a number of ^{17}O states which are believed to have $J\geq5/2$, $\Gamma_\alpha/\Gamma\geq0.6$). For other observations or the angular distributions or the cross sections for the ^{14}N(α,p) reaction to many ^{17}O states have been studied in (1953He58, 1961Ya02, 1970Ze01, 1996Gi14, 1999Xu07, 2005De54, 2006We05, 2008Te09, 2017Ko31).

γ(^{17}O)

E_γ	E_i(level)	E_f	Comments
870.7 *2*	871	0	E_γ: from (1975Th01). See also (1969Sc21,1974Sc09,2018Sm01).

$^{14}N(\alpha,p),^{4}He(^{14}N,\gamma^{17}O)$ 1969Ro07,1969Ba17

Level Scheme



^{14}N(^{6}Li,^{3}He) 1973Bi01,1984Et01

1973Bi01: The mirror states below E_x=7 MeV in ^{17}O and ^{17}F were populated using an 18 MeV ^{6}Li beam from the UPenn tandem accelerator to bombard a ^{nat}N gas target. The reaction products were momentum analyzed in the Penn multiangle spectrograph. Triton and ^{3}He spectra were measured at θ_{lab}=15°. A new ^{17}F state at E_x=5.220 MeV *10* was observed, which is identified as the mirror state of ^{17}O*(5.217 MeV) with J^π=(9/2$^-$).

1984Et01: The experiment was performed using an E(^{6}Li)=26 MeV ion beam provided by the Oxford folded tandem accelerator. The beam impinged on a thin-window ^{14}N gas (natural purity) target. A ΔE-E telescope array and five side counters were used to measure the angular distributions and the angular correlations with an overall energy resolution of 250 keV. Alpha decays were observed from ^{17}O and ^{17}F excited states, which showed a predominance for α emission to the ground state. Five excited states of ^{17}O and tentative J^π values were deduced.

See also (1972BiZM,1979MaZO).

^{17}O Levels

E(level)†	J^π	Comments
0		
871		
3055		
3841		
4555		
5083		
5217	(9/2$^-$)	J^π: from (1973Bi01), measured at θ_{lab}=15°.
5377		
5696		Unresolved (5700+5730).
5732		Unresolved (5700+5730).
5867		Unresolved (5870+5940).
5936		Unresolved (5870+5940).
6356		E(level): very weakly populated, background subtraction uncertain.
6860		
6971		
8.48×10^3	7/2$^+$	J^π: from (1984Et01).
10.7×10^3	(11/2$^+$)	J^π: from (1984Et01).
12.0×10^3	(7/2$^+$)	J^π: from (1984Et01).
13.53×10^3	(9/2$^+$)	J^π: from (1984Et01).
14.88×10^3	(15/2$^+$)	J^π: from (1984Et01).

† E_x≤7 MeV: see (1973Bi01); E_x>7 MeV: see (1984Et01).

^{15}N(d,p),(d,d),(d,γ) 1957Bo04,1977Ca03

1957Bo04: ^{15}N(d,p), E=1.36,1.90 MeV; evidence for weak resonances corresponding to ^{17}O states at 15.18 MeV and 15.69 MeV.
1972CaYU: ^{15}N(d,γ), E<23 MeV; measured σ(E). ^{17}O deduced resonances, J, π.
1977Ca03: ^{15}N(d,d),(d,p), E=1.4-2.7 MeV; measured σ(E,θ).
1986AnZL: ^{15}N(d,γ), measured σ, $\sigma(\theta)$; deduced dominant multipole contributions.
1988Co10: ^{15}N(d,γ), E=16 MeV; measured capture σ, $\sigma(\theta)$; deduced A_0, a_1 coefficients. ^{17}O deduced GDR excitation mechanism.

Theory:
1973Ba74: ^{15}N(d,p), calculated $\sigma(\theta)$.

^{17}O Levels

E(level)†	E_{res} (keV)	Comments
15245	1360	E(level): from E_d=1360 keV (1957Bo04); see also $E_d\approx$1400 keV (1977Ca03: ^{15}N(d,d)).
≈15633	≈1800	E(level): from $E_d\approx$1800 keV (1977Ca03).
15721	1900	E(level): from E_d=1900 keV (1957Bo04).
≈16162	≈2400	E(level): from $E_d\approx$2400 keV (1977Ca03).

† Level energies are deduced using E_d(res) and ^{2}H, ^{15}N and ^{17}O mass excesses from (2021Wa16: AME-2020) where E_d(res) is listed. $E_x=S(^2H)+M(^{15}N)/(M(^2H)+M(^{15}N))*E_d(res)$.

^{15}N(d,α) 1966Ti03

1959Fi30: ^{15}N(d,α), E=21 MeV; The angular distributions of charged particles have been measured.
1966Ti03: ^{15}N(d,α), E=0.81-1.8 MeV. ^{17}O deduced nuclear properties.
1965Ma59: ^{15}N(d,α), E=1.2-2.5 MeV; measured products.
1976Ca28: ^{15}N(d,α), E<3 MeV; measured $\sigma(E,E_\alpha,\theta)$. ^{17}O deduced resonance, Γ.
1986Sa41: ^{15}N(d,α), E=804 keV-1.2 MeV; measured products.
1996Vi12: ^{15}N(d,α), E=0.4-2 MeV; measured $\sigma(E,\theta)$. Comparisons with earlier results.

^{17}O Levels

E(level)†	J^π	Γ	E_{res} (keV)	Comments
14980	5/2$^+$	≈100 keV	1060	E(level),Γ: from E_d=1060 keV (1966Ti03). J^π: from (1966Ti03).
15148	(5/2$^-$,7/2$^-$)	≈200 keV	1250	E(level): from E_d=1250 keV (1966Ti03). J^π: from (1966Ti03).
≈15500			≈1700	E(level): from E_d≈1700 keV, which is a likely multiplet corresponding to states around E_d=1.6-1.8 MeV. (1965Ma59).
≈15800		≈300 keV		E(level),Γ: from (1976Ca28).

† Level energies are deduced using E_d(res) and ^{2}H, ^{15}N and ^{17}O mass excesses from (2021Wa16: AME-2020) where E_d(res) is listed. E_x=S(^{2}H)+M(^{15}N)/(M(^{2}H)+M(^{15}N))*E_d(res).

^{15}N(^{3}He,p) 1972Le01

1972Le01: The ^{15}N(^{3}He,p) double-stripping reaction was studied using a E(^{3}He)=18 MeV beam from the Saclay E(n) tandem Van de Graaff to bombard a 25±3 μg/cm^{2} 99% enriched ^{15}N target. The emitted protons were momentum analyzed using a magnetic spectrograph with an energy resolution of ≈30 keV. Differential cross sections for transitions to ^{17}O states up to E_x=11 MeV were measured. The data were analyzed using DWBA analysis and the L values were also deduced.
1975Ha33: ^{15}N(^{3}He,p), E=15 MeV; measured σ(Ep,θ).
See also (1965Se01,1963Pa01,1970LeZT,1971SeZZ,1974AbZZ).

^{17}O Levels

E(level)†	Jπ†	Γ	L	Comments
0	5/2+		(1+3)	E(level): See also (1975Ha33).
874	1/2+		1	
3053 *10*	1/2−		0	E(level): See also 3.055-MeV (1975Ha33).
3845 *10*	5/2−		2	
4549 *10*	3/2−		0	
5081 *10*	3/2+		(1)	
5215 *10*	(9/2−)‡		(4)	
5381 *10*	3/2−		0	
5698 *10*	7/2−		2	
5873 *10*	3/2+		(1)	
5938 *10*	1/2−		0	
6370 *10*	1/2+			
6861 *10*	(1/2−)‡		(0)	
6973 *10*	(5/2+)‡		(1+3)	
7162 *10*	5/2−		2	
7382 *10*	5/2−		2	
7561 *10*	(7/2+)‡			
7687 *10*	7/2−			
7761 *10*	(11/2−)‡		4	Jπ: See also (1969Lu07: ^{15}N(α,d)).
7938 *10*	1/2−			
8054 *10*	3/2+		(1)	
8192 *10*	3/2−		0	
8322 *10*	1/2+			
8390 *10*	5/2+			
8492 *10*	5/2−		(2)	
8682 *10*	3/2−			
8900 *10*	7/2−			
8955 *10*	7/2−			
9160 *10*	(9/2−)		(4)	Jπ: See also (1969Lu07: ^{15}N(α,d)).
9495 *10*	5/2−			
9712 *10*	7/2+			
9856 *10*	9/2+			
10240? *10*	7/2+			
10330 *10*	(7/2−)			
10570 *10*	(5/2,7/2)			
10693 *10*	(7/2+)			
10782 *10*	(5/2)			
10913 *10*				
11032 *4*				T=1/2 (1970Mc02) E(level): See also 11.02-MeV (1970Mc02).
11075 *4*	1/2−	5 keV *1*		T=3/2 (1972Le01) E(level): See also 11.075 MeV *5* (Barnes et al., Proc. Intern. Conf. on Nucl. Phys., Gatlinburg, Tennessee, 12-17 Sept. 1966 (Academic, New York, 1967) p.884: ^{15}N(^{3}He,p)). Jπ,T: See also (1973Ad02).

Continued on next page (footnotes at end of table)

$^{15}N(^{3}He,p)$ 1972Le01 (continued)

^{17}O Levels (continued)

E(level)†	Jπ†	Γ	L	Comments
				Γ: A variety of widths and branching ratios from (1973Ad02) became associated with this reaction and level, but the width Γ= 5 keV *1* from McDonald et al., Bull. Amer. Phys. Soc. 16, 489 (1971) is from $^{13}C(\alpha,n)$ and later published in (1966Mc11). The branching ratios and partial widths from (1973Ad02) are are discussed in $^{18}O(^{3}He,\alpha)$.

† From (1972Le01). Uncertainty of energy level is $\pm\varepsilon$ with $\varepsilon\leq10$ keV except where listed otherwise.
‡ Speculative, not directly measured value.

^{15}N(α,d) 1969Lu07

1969Lu07: α-particle beams at 45.4 MeV, provided by the Berkeley 88-inch cyclotron, bombarded a ^{15}N gas target (99.71% purity). The resulting deuteron energy spectrum was measured at θ_{lab}=13.2°−82.2°. The energy resolution (FWHM) was about 150 keV. Ground state and excitation states of ^{17}O were deduced.

See also (1968LuZY,1968LuZZ; thesis).

^{17}O Levels

E(level)†	J^{π}†	Comments
0		
870 *50*		
3850 *50*		
4566 *50*		
5208 *30*		
5690 *30*		
7367 *30*		
7742 *20*	(11/2$^-$)	T=1/2 E(level): See also 7.6 MeV *2* (1962Ha40). Dominant configuration: $(d_{5/2})^2_5 p^{-1}_{1/2}$. See also (1966Ri04).
8147 *30*		
8459 *30*		
8890 *30*		
9137 *30*	(9/2$^-$)	T=1/2 E(level): See also 9.0 MeV *2* (1962Ha40). Dominant configuration: $(d_{5/2})^2_5 p^{-1}_{1/2}$. See also (1966Ri04).
9814 *30*		

† From (1969Lu07). See also (1962Ha40) for levels observed.

^{15}N(^{11}B,^{9}Be)

1975Po10: ^{15}N(^{11}B,^{9}Be), E=113.5 MeV, θ_{lab}=8.5°; measured σ(E(^{9}Be)).
1979Ra10: ^{15}N(^{11}B,^{9}Be), E=115 MeV; measured $\sigma(\theta)$. ^{17}O, levels deduced S, parity.
1980Pr09: ^{15}N(^{11}B,^{9}Be), E=115 MeV; measured $\sigma(\theta)$. ^{17}O, deduced S. DWBA analysis, sequential transfer.

^{17}O Levels

E(level)	J^{π}
0†#	
0.9×10^{3}†	
3.0×10^{3}†	
3.82×10^{3}#	
5.23×10^{3}‡#	$9/2^{-}$‡
5.4×10^{3}†	
5.68×10^{3}#	
7.6×10^{3}†	
7.75×10^{3}‡#	$11/2^{-}$‡
9.0×10^{3}†	
9.18×10^{3}‡#	$9/2^{-}$‡

† (1975Po10); 7.6 and 9.0 MeV are strongly populated groups.
‡ (1980Pr09).
# (1979Ra10).

^{16}O(n,γ):E(n)=10-80 keV 2008Oh05

1994NaZT: ^{16}O(n,γ), E=10-80 keV; measured Eγ, Iγ; deduced Maxwellian-averaged σ.
1995Ig07: ^{16}O(n,γ), E=10-80 keV; measured σ; deduced Maxwellian averaged σ, nonresonant p-wave capture role.
2008Oh05: XUNDL dataset compiled by McMaster, 2008.
E(n)=10-80 keV neutrons produced in the reaction ^{7}Li(p,n) reaction using the 3.2 MV Pelletron accelerator at the Tokyo Institute of Technology. Measured Eγ, Iγ, $\gamma\gamma$ coin using anti-Compton NaI(Tl) spectrometer, time-of-flight method.
Main study was on neutron capture in ^{18}O leading to levels in ^{19}O. Since ^{16}O and ^{12}C were present in the target, side measurements were done on these two nuclides as well.

^{17}O Levels

E(level)	J$^{\pi}$	C^{2}S	Comments
0	5/2$^+$	0.9† *1*	
870	1/2$^+$	0.9† *1*	
3060	1/2$^-$		
(4190)			S(n)=4143.13 *11* (2003Au03), E(n)(lab)≈47 keV.

† Quoted by (2008Oh05) as 0.8 to 1.0.

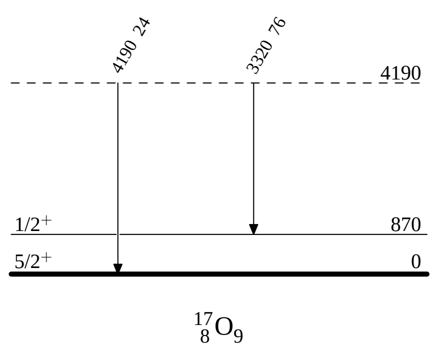
γ(^{17}O)

E$_i$(level)	E$_\gamma$	I$_\gamma$	E$_f$	J$^{\pi}_f$
(4190)	3320	76	870	1/2$^+$
	4190	24	0	5/2$^+$

^{16}O(n,γ):E(n)=10-80 keV 2008Oh05

Level Scheme

Intensities: % photon branching from each level



^{16}O(n,γ),(n,n) 1973Fo11

1971Al09: ^{16}O(n,γ), E=420 keV; measured σ(E; Eγ). ^{17}O resonances deduced level-width.
1973Fo11: ^{16}O(n,γ),(n,n) E=0.6-4.3 MeV; measured σ(E). ^{17}O deduced levels, J, π, Γ.
1988Ki02: ^{16}O(n,γ), E≈resonance; measured Eγ, Iγ. ^{17}O, deduced resonance Γγ. Valence capture model.
1992Ig01: ^{16}O(n,γ), E=280,434 keV; measured σ(E,Eγ) at θ=125°. ^{17}O deduced resonance, Γγ. Natural target. Valence-capture model.
1994Hu21: ^{16}O(n,γ), E=7-14 MeV; measured σ(θ) vs E; deduced σ(γ,n_0). ^{17}O deduced pygmy resonance characteristics.
1996Na27: ^{16}O(n,γ), E=10-300 keV; measured Eγ, Iγ, capture σ at some neutron energies. Implications for primordial and stellar nucleosynthesis.
2000OhZY: ^{16}O(n,γ), E≈150-550 keV; measured σ.
2020Na34: ^{16}O(n,γ), $E_{ave.}$≈157-556 keV; measured σ, deduced astrophysical reaction rates.
Theory:
2007AsZY: ^{16}O(n,γ), E=low; calculated capture cross sections.
2010YaZW: ^{16}O(n,γ), E=low; calculated intrinsic nuclear densities for two configurations.
1997Li10: ^{16}O(n,γ), E<600 keV; calculated σ(E_n); deduced influence of scattering potential depth. Consistent direct-semidirect model.
2001Du12: ^{16}O(n,γ), E(cm)≈10-300 keV; calculated σ. Generator coordinate method, cluster model. Comparisons with data.
2005Du20: ^{16}O(n,γ), E(cm)≈10-300 keV; calculated σ(E). Microscopic two-cluster model, generator coordinate method, comparison with data. ^{17}O; calculated levels, J, π.
2007AsZZ: ^{16}O(n,γ), deduced S-factors using ANC values from transfer reactions.
2008Ch05: ^{16}O(n,γ), E=0.01-10 MeV; calculated neutron capture cross sections.
2008YaZY: ^{16}O(n,γ), E<0.6 MeV; calculated cross sections using the Cluster Orbital Shell Model to describe the nuclear structure.
2009Wa17: ^{16}O(n,γ), E(cm)<1 MeV; analyzed σ, spectroscopic factors and other parameters for nonresonant neutron capture using simple polynomials obtained from Taylor expansions. Comparison with experimental data.
2009Ya03: ^{16}O(n,γ), E(cm)<10 MeV; calculated cross sections.
2010Hu11: ^{16}O(n,γ), E(cm)<2 MeV; calculated binding energies, σ, S-factors, spectroscopic factors. Single-particle potential model.
2010Pr07: ^{16}O(n,γ), E=0.001-1 MeV; calculated Maxwellian-averaged σ and astrophysical reaction rates using evaluated neutron libraries; deduced ENDF/B-VII.0, JENDL-3.3, JEFF-3.1, ENDF/B-VI.8 neutron-induced reaction σ deficiencies. Comparison with experimental data and KADONIS.
2010Sp01: ^{16}O(n,γ), E not given; calculated asymptotic normalization constants (ANC) as a function of binding energy for subthreshold bound states using the analytic continuation of the scattering (S) matrix in the complex wave-number plane.
2011Ch57: ^{16}O(n,γ), E=30 keV; calculated Maxwellian-averaged σ using ENDF/B-VII.1 evaluated neutron library. Comparison with ENDF/B-VII.0 and KADONIS values.
2012Pr13: ^{16}O(n,γ), E<20 MeV; calculated Maxwellian-averaged σ, astrophysical reaction rates, neutron thermal σ, Westcott factors, resonance integrals and their uncertainties using evaluated neutron libraries; deduced ENDF/B-VII.1, JEFF-3.1.2, JENDL-4.0, ROSFOND 2010, CENDL-3.1, EAF 2010 neutron-induced reaction σ deficiencies. Comparison with experimental data, KADONIS and Atlas of Neutron Resonances.
2012Xu09: ^{16}O(n,γ), E=1-10000 keV; calculated total neutron direct capture cross sections. Comparison with experimental data.
2013Du15: ^{16}O(n,γ), E<1 MeV; calculated σ. Modified cluster model with the classification of orbital states according to Young tableaux, comparison with available data.
2013Du16: ^{16}O(n,γ), E<1 MeV; calculated σ, phase shifts. Young diagrams, potential cluster model.
2013He11: ^{16}O(n,n),(n,γ), E<20 MeV; calculated JENDL-4.0 covariances. Comparison with available data.
2014Xu09: ^{16}O(n,γ), E=0.001-10 MeV; calculated total capture σ(E) for three processes of compound-nucleus capture (CNC), pre-equilibrium capture (PEC), and direct capture (DIC) using Hauser-Feshbach model, the exciton model, and potential model, respectively, and Compared with experimental data. Z=8-100, N=10-180; calculated total neutron-capture cross sections and astrophysical reaction rates using TALYS code for about 8000 nuclei. Impact of the newly determined reaction rates on the r process abundances.
2015Sa01: ^{16}O(n,n),(n,n′),(n,γ), E<20 MeV; analyzed available data; deduce σ uncertainties adjustments. Comparison with available data.
2015Zh13: ^{16}O(n,γ), E<3 MeV; calculated σ(E) using nuclear structure information obtained from a covariant density functional theory as input for the FRESCO coupled reaction channels code; investigated impact of pairing, spectroscopic factors, and optical

^{16}O(n,γ),(n,n) 1973Fo11 (continued)

potentials on direct capture cross sections. Comparison with experimental data.
2016Mo23: ^{16}O(n,γ), E<700 KeV; analyzed available experimental data from KADoNiS and REACLIB, ENDF/B-VII.1, JEFF-3.2, JENDL-4.0 evaluated libraries; deduced Maxwellian-averaged σ, reaction rates.
2018Br05: ^{16}O(n,γ), E=30 keV; calculated Maxwellian-averaged σ using ENDF/B-VIII.0 evaluated neutron library. Comparison with ENDF/B-VII.1 and KADONIS values.
2020He19: ^{16}O(n,γ), E<1 MeV; analyzed contributions from single-particle resonances, evaluated astrophysical reaction rates and associated uncertainties for nucleosynthesis.
2021Zh26: ^{16}O(n,γ), calculated direct capture, thermonuclear reaction rates for astrophysical applications.
See also (2001Sh27).

^{17}O Levels

Γ: From (1973Fo11) except where noted.

E(level)[†‡]	J$^{\pi}$[†]	Γ[#]	E$_n$(res) (keV)	Comments
0	5/2$^+$			E(level),J$^{\pi}$: from ENSDF database.
870	1/2$^+$			E(level),J$^{\pi}$: from ENSDF database.
4544 *10*	3/2$^-$		426 *10*	E(level): from E$_{res}$=426 keV *10* (1971Al09). Γ$_n$=60 keV *15*, Γ$_\gamma$<4.0 eV (1971Al09).
5216		<0.1 keV		E(level): not observed in σ$_t$ (1973Fo11).
5696 *2*	7/2$^-$	3.4 keV	1651 *2*	
5732 *2*	[a]	<1 keV	1689 *2*	
5867 *2*	3/2$^+$	6.6 keV	1833 *2*	
5938 *4*	1/2$^-$	32 keV	1908 *4*	
6355 *8*	1/2$^+$	124 keV	2351 *8*	
6861 *2*	[a]	<1 keV	2889 *2*	
6971 *2*	[a]	<1 keV	3006 *2*	
7164 *3*	5/2$^-$[@]	1.3 keV	3211 *3*	
7.20×10^3 *1*	3/2$^+$	280 keV	3.25×10^3 *1*	
7377 *3*	5/2$^+$[@]	0.5 keV	3438 *3*	
7380 *3*	5/2$^-$[@]	1.1 keV	3441 *3*	
7.56×10^3 *2*	3/2$^-$	500 keV	3.63×10^3 *2*	
7574		<0.1 keV		E(level): not observed in σ$_t$ (1973Fo11).
7686 *4*	7/2$^-$	18 keV	3766 *4*	
7956 *8*	1/2$^+$	90 keV	4053 *8*	
7.99×10^3 *5*	1/2$^-$	270 keV	4.09×10^3 *5*	
8058 *8*	3/2$^+$	85 keV	4162 *8*	
8.18×10^3 *2*	1/2$^-$[&]	69 keV	4.29×10^3 *2*	
8.20×10^3 *1*	3/2$^-$[&]	52 keV	4.31×10^3 *1*	Γ: deduced from (1961Fo07).

[†] From (1973Fo11) except where noted.
[‡] Level energies are deduced using E$_n$(res) and *n*, ^{16}O and ^{17}O mass excesses from (2021Wa16: AME-2020) where E$_n$(res) is listed. E$_x$=S$_n$+M(^{16}O)/(M$_n$+M(^{16}O))*E$_n$(res).
[#] Uncertainties in widths ≈0.1Γ for Γ>3 keV and ≈0.3Γ for Γ<3 keV. The (1973Fo11) values have overlap with those given in ^{16}O(n,n),(n,n′); the uncertainties are given there to avoid duplication.
[@] Assignment based on ^{13}C(α,n) and ^{16}O(n,n) (1970Fo03,1957Wa46), and ^{13}C(α,n) (1973Ba10).
[&] Assignment based on ^{13}C(α,n) (1957Wa46).
[a] J$^{\pi}$: not 1/2$^+$ (1973Fo11).

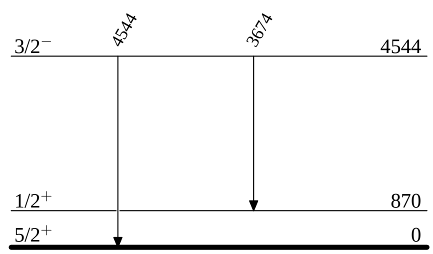
^{16}O(n,γ),(n,n) 1973Fo11 (continued)

γ(^{17}O)

E_γ	E_i(level)	J_i^π	E_f	J_f^π	Comments
3674	4544	3/2$^-$	870	1/2$^+$	Γ_γ=1.64 eV *31* (1988Ki02); Γ_γ=1.85 eV *35* (1992Ig01)
4544	4544	3/2$^-$	0	5/2$^+$	Γ_γ=1.59 eV *31* (1988Ki02); Γ_γ=1.80 eV *35* (1992Ig01)

^{16}O(n,γ),(n,n) 1973Fo11

Level Scheme



$^{17}_{8}O_{9}$

^{16}O(n,n),(n,n′) 1973Jo01,1981Hi01

^{16}O(n,n),(n,n′):
1953Ad02: ^{16}O(n,n), E=1 MeV; measured products; deduced resonance parameters.
1954Th42: ^{16}O(n,n′), E=14.1 MeV; measured products, ^{12}C, ^{16}O.
1955Ok01: ^{16}O(n,n),(n,x), E=214-686 keV; measured products, O; deduced σ, σ(E), $\sigma(\theta)$, resonance parameters.
1957Wa46: ^{16}O(n,n), E=3.4-5.2 MeV; measured products, ^{4}He; deduced σ, σ(E), resonance parameters.
1966Mc01: ^{16}O(n,n′γ), E=14.1 MeV; measured σ(En′,θ), σ(Eγ,θ), $\gamma\gamma$-coin. ^{16}O deduced levels.
1969Bu08: ^{16}O(n,n′γ), E=14.6 MeV; measured σ.
1969Me15: ^{16}O(n,n),(n,n′), E=14 MeV; measured $\sigma(\theta)$; deduced optical model parameters.
1970Bo30: ^{16}O(n,n), E=14-19 MeV; measured σ(E). ^{17}O deduced resonances, J, π, T.
1970Fo03: ^{16}O(n,n), E=1.116-3.67 MeV; measured σ(E; θ). ^{17}O deduced resonances, L, J, π, level-width.
1970Lu16: ^{16}O(n,n′γ), E<8.2 MeV; measured σ(E; Eγ,$\theta(\gamma)$). ^{17}O deduced resonances, J, π.
1972Bo52: ^{16}O(n,n),(n,n′), E=14.1 MeV; measured $\sigma(\theta)$.
1973FoZU: ^{16}O(n,n′); measured $\sigma(E_{n'})$. ^{17}O deduced resonances, level-width, J, π.
1973Hi09: ^{16}O(n,n), E=1-4 MeV; measured σ(E), n-polarization.
1974Co10: ^{16}O(n,n), E=0.5-1.3 MeV; measured nothing, analyzed σ(E) data. ^{17}O level deduced S.
1974Ge03: ^{16}O(n,n), measured nothing, calculated σ(E) with up to 4p-4h states included.
1975Po08: ^{16}O(n,n′γ), E=14.9 MeV; measured σ(Eγ), n′γ-coin.
1976Dr08: ^{16}O(pol. n,n), E=2.25-3.90 MeV; measured A(E,θ).
1978No04: ^{16}O(n,n′γ),(n,$\alpha\gamma$), E=7-10.5 MeV; measured σ(E,Eγ).
1979GrZP: ^{16}O(n,n),(n,n′), E=24 MeV; measured $\sigma(\theta)$. Coupled-channels analysis.
1979GrZU: ^{16}O(n,n),(n,n′), E=24 MeV; measured $\sigma(\theta)$. Optical model, DWBA analysis.
1979Ko26: ^{16}O(n,n), E=0.51,0.68 MeV; measured small angle scattering; deduced coherent scattering lengths for bound atoms. Crystalline powder targets, Christiansen filter.
1980GlZZ: ^{16}O(n,n),(n,n′), E not given; measured $\sigma(\theta)$; deduced optical potential energy dependence. Optical model, coupled-channel analyses, isospin effects.
1980Gr15: ^{16}O(n,n),(n,n′), E=24 MeV; measured σ(E,θ); deduced optical model parameters. ^{16,18}O deduced deformation lengths, transition matrix elements. Enriched targets. Coupled-channels, DWBA analyses.
1981Hi01: ^{16}O(n,n), E=3-30 MeV; measured transmission vs E. ^{17}O resonances deduced t, Γ, Γ_n. Natural target.
1982FiZW: ^{16}O(pol. n,n′), E=10 MeV; measured $\sigma(\theta)$, asymmetry. Optical model analysis.
1982Gl09: ^{16}O(n,n), E=9.21-14.93 MeV; measured $\sigma(\theta)$, $\sigma(E_n)$, σ(total) vs E. ^{17}O deduced resonances, Γ, Γ_n, J, π. Optical model plus resonance effect, Legendre polynomial analyses.
1983Da22: ^{16}O(n,n), E=7-15 MeV; measured $\sigma(\theta)$; deduced spherical optical model parameters.
1983IsZW: ^{16}O(n,n),(n,n′), E=22 MeV; measured $\sigma(\theta)$. DWBA, coupled-channels analyses.
1984IsZZ: ^{16}O(n,n),(n,n′), E=18-26 MeV; measured $\sigma(\theta)$; deduced two-step process role. Optical model, coupled-channels analyses.
1985AnZX: ^{16}O(pol. n,n), E=5-17 MeV; measured analyzing power vs θ, $\sigma(\theta)$.
1985Ko16: ^{16}O(n,n′γ), E=25-2000 keV; measured neutron detection efficiency. ^{16}O deduced resonance effect. Thick Ne-912 lithium glass scintillator.
1985La13: ^{16}O(pol. n,n), E=23 MeV; measured $\sigma(\theta)$, A(θ). Optical model potential analysis.
1985Pe10: ^{16}O(n,n), E=18-26 MeV; measured $\sigma(\theta)$ vs E; Micropscopic optical model.
1986De10: ^{16}O(n,n), E=18-46 MeV; measured σ(E,θ); deduced giant resonance coupling, *l*-dependent potential effects. Natural target, coupled channel analysis.
1986FiZY: ^{16}O(n,n),(n,n′), E=18-26 MeV; measured σ(E,θ); deduced heavy-ion recoil contribution to kerma factors, optical model parameters.
1986HaZI: ^{16}O(pol. n,n), E=7.18,7.5,7.71,7.81,8.05 MeV; measured $\sigma(\theta)$, analyzing powers. Optical model analyses.
1986IsZW: ^{16}O(n,n),(n,n′), E=18-26 MeV; measured $\sigma(\theta)$. ^{16}O levels deduced excitation mechanism. Tof. Coupled-channels approach.
1986IsZZ: ^{16}O(n,n),(n,n′), E=18-46 MeV; measured $\sigma(\theta)$. ^{16}O deduced giant resonances.
1987Is04: ^{16}O(n,n),(n,n′), E=18-26 MeV; measured $\sigma(\theta)$. DWBA, coupled-channels analyses.
1987Is03: ^{16}O(n,n),(n,n′), E=18-60 MeV; measured $\sigma(\theta)$; deduced optical model parameters, partial kerma factors. Previously

^{16}O(n,n),(n,n′) 1973Jo01,1981Hi01 (continued)

acquired data included in analysis.
1988MeZX: ^{16}O(n,n′), E=20-26 MeV; measured not given. ^{16}O levels deduced transition matrix elements.
1989Li26: ^{16}O(pol. n, n), E=5-17 MeV; measured $\sigma(\theta)$, analyzing power vs θ; deduced model parameters. Other data analysis, optical model.
1990Ol01: ^{16}O(n,n),(n,n′), E=21.6 MeV; measured $\sigma(E,\theta)$; deduced optical-model potential parameters. DWBA, coupled-channels analyses.
1992Qi02: ^{16}O(n,n), E=14.8 MeV; measured $\sigma(\theta)$; deduced model parameters. Spherical optical model, coupled-channels analysis.
1994Lo25: ^{16}O(n,n′γ), E=7.2-8.4 MeV; measured γ production σ(E); compiled, reviewed, analyzed σ(E) evaluations; deduced BGO detector utilization features as active oxygen target.
1995Be69: ^{16}O(n,n′γ), E=6.2-8.51 MeV; measured $\sigma(\theta)$. Inconsistencies, errors in neutron σ libraries.
2002NeZY: ^{16}O(n,n′),(n,2n),(n,p),(n,d),(n,α),(n,nα), E=4-200 MeV; measured Eγ, Iγ, $\sigma(\theta)$, excitation functions. Comparison with previous results.
2006Me26: ^{16}O(n,n),(n,n′), E=95 MeV; measured $\sigma(E,\theta)$; deduced three-nucleon force effects, recoil kerma coefficients.
2008MeZW: ^{16}O(n,n),(n,n′), E≈95 MeV; measured E_n, $I_n(\theta)$; deduced dσ(E), d$\sigma(\theta)$; calculated dσ using different forces with and without 3N component. Compared to other data and calculations.
2008Ta15: ^{16}O(n,n′),(n,γ), E=14 MeV; measured Eγ, Iγ using a NaI(Tl) detector with multiple time-gated system for use with complex samples.
2010La05: ^{16}O(n,n), E=ultracold; measured σ, γ-spectra, Bragg reflection spectra, low-temperature dependence on yield of ultracold neutrons. Liquid orthodeuterium and solid oxygen targets. Pulse-neutron incident beam.
2018Sc04: ^{16}O(n,n),(n,n′),(n,α), E=1-10 MeV; measured reaction products, E_n, I_n; deduced light and heavy water leakage neutron flux density, neutron fluences for the light and heavy water spheres. Comparison with calculations using ENDF/B-VII.0, ENDF/B-VIII.b4 and JENDL-4 nuclear data libraries.
See also (1971Do15,1992Ba50,2017Sv01: theory).

Theory:
^{16}O(n,n),(n,n′),(n,α).
1971We08: ^{16}O(n,n), E=0.5-4 MeV; calculated σ(E). ^{17}O resonances deduced S.
1972JoZV: ^{16}O(n,n),(n,α), E=600-930, 1390-1640 keV; measured σ(nT). ^{17}O deduced resonances, level-width.
1973Jo01: ^{16}O(n,X),(n,α), E<5.8 MeV; analyzed σ(E). ^{17}O deduced resonances, J, π, level-width, S.
1975Ge08: ^{16}O(n,n), E<4 MeV; calculated total σ(E), polarization. ^{17}O deduced resonances, Γ.
1977No07: ^{16}O(n,n), E=th; calculated scattering parameters.
1986Sh33: ^{16}O(n,n),(n,n′),(n,α), E=threshold−20 MeV; compiled, evaluated neutron induced reaction data. R-matrix theory, direct, preequilibrium processes.
1990Ha38: ^{16}O(n,n), E≤20 MeV; calculated phase shifts vs E. Cluster-orbital shell model, resonating group method.
1995Ch84: ^{16}O(n,n),(n,α), E=6.2-10.5 MeV; analyzed σ, $\sigma(\theta)$; deduced R-matrix parameters.
2000SaZK: ^{16}O(n,n), E=0-6.3 MeV; ORNL lab report R-matrix Evaluation of ^{16}O neutron cross sections; deduced E_{res}, E_x, Γ_n, Γ_α and Γ.
2012Pr13: ^{16}O(n,n), E<20 MeV; calculated neutron thermal σ, Westcott factors, resonance integrals and their uncertainties using evaluated neutron libraries; deduced ENDF/B-VII.1, JEFF-3.1.2, JENDL-4.0, ROSFOND 2010, CENDL-3.1, EAF 2010 neutron-induced reaction σ deficiencies.
2017HaZY: ^{16}O(n,n),(n,x),(n,α), E=0-7 MeV; calculated total σ, $\sigma(\theta)$; compared with data and ENDF VIII.0-CIELO.

^{17}O Levels

Notes:
1) Values from (1964St25) are recommended values.
2) (1973Jo01) is an analysis of prior works of (1955Ok01, 1958St28, 1961Fo07, 1969Da13, 1973Fo11).
3) The levels at E_x=5216, 7576 keV were searched for by (1973Fo11) but not observed. The lack of observation suggests narrow widths for these states of Γ<0.1 keV. (1957Wa46) observed a level at E_x=7559 keV with Γ≤4 keV and J^π≥7/2 which might be the 7576-keV state.
4) See ^{13}C(α,n) for additional neutron resonance levels that are not reported in ^{16}O(n,n) reactions. See also (1981MuZQ).

Continued on next page (footnotes at end of table)

^{16}O(n,n),(n,n′) 1973Jo01,1981Hi01 (continued)

^{17}O Levels (continued)

E(level)[†]	J^π	Γ[‡]	L	E_n(res) (keV)	Comments
4550[&] *4*	3/2−[@]	39[#] keV *3*	1	433 *4*	E(level): from E_n=433 keV *4* (1958Hu18). See also E_n(keV)=440 (1950Bo95,1951Bo45), 442 (1955Ok01,1964St25). Γ: From $Γ_{lab}$=41 keV *3*. See also $Γ_{lab}$(keV)=45 (1950Bo95), 40 (1951Bo45), 48 (1955Ok01), 46 (1964St25) and $Γ_n$=45 keV (1973Jo01). L: See (1953Ad02,1955Ok01,1958Hu18,1964St25).
5082[&] *8*	3/2+[@]	90[#] keV *5*	2	998 *8*	E(level): from E_n=998 keV *8* (1958Hu18). See also E_n=1000 keV (1950Bo95, 1951Bo45, 1958La09, 1958St28, 1964St25). Γ: From $Γ_{lab}$=96 keV *5*. See also $Γ_{lab}$=100 keV (1950Bo95, 1951Bo45, 1958St28, 1964St25) and $Γ_n$=96 keV (1973Jo01). L: See (1953Ad02,1958Fo67,1958Hu18,1964St25).
5377.2[&] *35*	3/2−[@]	31[#] keV *4*	1	1312.0 *35*	E(level): from E_n=1312.0 keV *35* (Davis, et al., PLB 27, 636 (1968)). See also E_n(keV)=1310 *8* (1958Hu18), 1300 (1950Bo95), 1320 (1951Bo45), 1312 (1958St28,1964St25). Γ: From $Γ_{lab}$=33 keV *4*. See also $Γ_{lab}$=40 keV (1950Bo95), 35 keV (1951Bo45), 42 keV (1964St25), 44 keV (1958St28) and $Γ_n$=41.5 keV (1973Jo01). L: See (1953Ad02,1958Hu18,1964St25).
5696[&] *2*	7/2−[@]	3.4[a] keV *3*		1651 *2*	E(level): from E_n=1651 keV *2* (1973Fo11). See also E_n(keV)=1651 *6* (1958Hu18), 1660 (1951Bo45,1958La09), 1651 (Jo68: Johnson, et al., Neutron Cross Sections and Technology, Proc. Conf.; NBS Special Publication 299 Vol. II, 851 (1968)). Γ: See also $Γ_{lab}$≤7 keV (1951Bo45,1958Hu18), $Γ_{lab}$=4 keV (Jo68) and $Γ_n$=3.4 keV (1973Jo01). L: See (1951Bo45: >0) and (1958Hu18: ≥1).
5732[&] *2*		<1[a] keV		1689 *2*	E(level): from E_n=1689 keV *2* (1973Fo11). See also E_n=1689 keV (Jo68). Γ: See also $Γ_{lab}$<1 keV (Jo68). J^π: ≠1/2+ (1973Fo11).
5867[&] *2*	3/2+[@]	6.6[a] keV *7*	2[g]	1833 *2*	E(level): from E_n=1833 keV *2* (1973Fo11). See also E_n(keV)=1830 *6* (1958Hu18), 1840 (1951Bo45), 1833 (Jo68). Γ: See also $Γ_{lab}$(keV)≤10 (1951Bo45), ≤8 (1958Hu18), Γ=7 keV (Jo68) and $Γ_n$=6.6 keV (1973Jo01). L: See also (1951Bo45: >0), (1958Hu18: ≥1).
5938[&] *4*	1/2−[@]	32[a] keV *3*	1	1908 *4*	E(level): from E_n=1908 keV *4* (1973Fo11). See also E_n(keV)=1903 *11* (1958Hu18), 1910 (1951Bo45,1964St25), 1906 (Jo68), 1900 (Ba52: Baldinger, et al., Helv. Phys. Acta 25, 142 (1952)). Γ: See also $Γ_{lab}$=30 keV (1951Bo45,1964St25), 28 keV *5* (1958Hu18) and $Γ_n$=31.5 keV (1973Jo01). L: See (1951Bo45,1958Hu18,1964St25).
6355[&] *8*	1/2+[@]	124[a] keV *12*	0	2351 *8*	E(level): from E_n=2351 keV *8* (1973Fo11). See also E_n(keV)=2370 *20* (1958Hu18), 2370 (1951Bo45,1964St25), 2350 (Ba52,Jo68). Γ: See also $Γ_{lab}$(keV)=120 (1951Bo45,1964St25), 140 *50* (1958Hu18), 180 (Ba52) and $Γ_n$=124 keV (1973Jo01). L: See (1951Bo45,1958Hu18,1964St25).
6861[&] *2*		<1[a] keV		2889 *2*	E(level): from E_n=2889 keV *2* (1973Fo11). See also E_n=2889 keV (Jo68). Γ: See also $Γ_{lab}$<1 keV (Jo68). J^π: ≠1/2+ (1973Fo11).
6971[&] *2*		<1[a] keV		3006 *2*	E(level): from E_n=3006 keV *2* (1973Fo11).

Continued on next page (footnotes at end of table)

^{16}O(n,n),(n,n′) 1973Jo01,1981Hi01 (continued)

^{17}O Levels (continued)

E(level)[†]	J^π	Γ[‡]	L	E_n(res) (keV)	Comments
					J^π: ≠1/2$^+$ (1973Fo11).
7164.24[&] *17*	5/2$^-$[@]	1.38[b] keV *5*	3[g]	3211.70 *17*	E(level): from E_n=3211.70 keV *17* (1980Ci03). See also E_n(keV)=3211 *3* (1973Fo11), 3213 (Jo68). Γ: See also Γ_{lab}=2 keV (Jo68), Γ=5 keV (1957Wa46), 1.3 keV *4* (1973Fo11), Γ_n=1.4 keV and Γ_α=0.0027 keV (1973Jo01), Γ_n/Γ_α=(1300) (1957Wa46) and Γ_{n0}=1.38 keV *5* (1980Ci03).
7200[&] *10*	3/2$^+$[@]	280[a f] keV *28*	2	3250 *10*	E(level): from E_n=3250 keV *10* (1973Fo11). See also E_n(keV)=3330 *30* (1958Hu18), 3290 *20* (1966Li03), 3350 (1967Jo12), 3330 (Ba52). Γ: See also Γ_{lab}=200 keV *40* (1958Hu18), 220 keV (Ba52), Γ=500 keV (1967Jo12), 400 keV *30* (1966Li03), Γ_n=280 keV and Γ_α=0.12 keV (1973Jo01) and Γ_n/Γ>0.99 (1966Li03). J^π: See also (1966Li03,1967Jo12). L: from (1958Hu18,1967Jo12).
7377.47[&] *19*	5/2$^+$[@]	0.64[b] keV *23*	2[g]	3438.38 *19*	E(level): from E_n=3438.38 keV *19* (1980Ci03). See also E_n(keV)=3438 *3* (1973Fo11), 3442 (Jo68). Γ: See also Γ(keV)=0.5 *2* (1973Fo11), 0.5 (1970Fo03), ≤4 (1957Wa46), Γ_n=0.5 keV and Γ_α=0.01 keV (1973Jo01), Γ_n/Γ_α=(450) (1957Wa46) and Γ_{n0}=0.64 keV *23* (1980Ci03).
7380.62[&] *14*	5/2$^-$[@]	0.96[b] keV *20*	3	3441.73 *14*	E(level): from E_n=3441.73 keV *14* (1980Ci03). See also E_n(keV)=3441 *3* (1973Fo11), 3440 (1961Fo07), 3444 (Jo68). Γ: See also Γ(keV)=1.1 *3* (1973Fo11), 1.1 (1970Fo03), ≤8 (1961Fo07), Γ_n=1.2 keV and Γ_α=0.0032 keV (1973Jo01) and Γ_{n0}=0.96 keV *20* (1980Ci03). L: see (1970Fo03).
7558 *20*	3/2$^-$[@]	500[a f] keV *50*	1	3630 *20*	E(level): from E_n=3630 keV *20* (1973Fo11). See also E_n(keV)=3770 *20* (1966Li03), 3600 (1964St25), (3600) (1961Fo01), 3643 (Jo68), 3750 (1967Jo12). Γ: See also Γ(keV)=360 *30* (1966Li03), 600 (1961Fo07,1964St25), 405 (1967Jo12), Γ_n=500 keV and Γ_α=0.08 keV (1973Jo01) and Γ_n/Γ>0.99 (1966Li03). J^π: See also (1966Li03,1967Jo12). L: from (1964St25,1967Jo12).
7666? *10*	(3/2,5/2)$^+$	≈20 keV	2	3745 *10*	(1973Fo11) indicates this level does not exist. E(level): from E_n=3745 keV *10* (1960Ts02). See also E_n=3770 keV (1961Fo07,1964St25), 3772 keV (1967Jo12). Γ: from (1960Ts02). See also Γ=25 keV (1961Fo07,1964St25), 22 keV (1957Wa46), 3 keV (1967Jo12). J^π: See (1957Wa46,1960Ts02,1961Fo07,1964St25, 1967Jo12). L: See (1964St25,1967Jo12).
7687.32 *22*	7/2$^-$[@]	14.4[b] keV *3*	3[h]	3767.76 *22*	E(level): from E_n=3767.76 keV *22* (1980Ci03). See also E_n(keV)=3780 *10* (1966Li03), 3765 *3* (1969Da13), 3766 *4* (1973Fo11), 3769 (1967Jo12). Γ: See also Γ(keV)=14 keV (1967Jo12), <23 (1966Li03), 18 keV *2* (1973Fo11), Γ_n=18 keV and Γ_α=0.01 keV (1973Jo01), Γ_n/Γ>0.99 (1966Li03) and

Continued on next page (footnotes at end of table)

^{16}O(n,n),(n,n′) 1973Jo01,1981Hi01 (continued)

^{17}O Levels (continued)

E(level)[†]	J^{π}	Γ[‡]	L	E_n(res) (keV)	Comments
					Γ_{n0}=13.0 keV *6* (1980Ci03). J^{π}: See also (1966Li03,1967Jo12).
7718? *80*	3/2⁻	753 keV *188*	1	3800 *80*	E(level): from E_n=3800 keV *80* (1958Hu18). See also E_n=3800 keV (Ba52). Γ: from Γ_{lab}=800 keV *200* (1958Hu18). See also Γ_{lab}=800 keV (Ba52). J^{π}: See (Ba52,1958Hu18). L: from (1958Hu18).
7956 *8*	1/2+[@]	90[a] keV *9*		4053 *8*	E(level): from E_n=4053 keV *8* (1973Fo11). J^{π}: See also (1973Fo11). Γ: See also Γ_n=84 keV and Γ_{α}=6.7 keV (1973Jo01).
7990 *50*	1/2⁻[@]	270[a f] keV *27*	1[h]	4090 *50*	E(level): from E_n=4090 keV *50* (1973Fo11). See also E_n(keV)=3920 *20* (1966Li03), 4000 (1967Jo12), (3980) (1961Fo07). Γ: See also Γ(keV)=245 *30* (1966Li03), 110 (1957Wa46: triplet), Γ_n=250 keV and Γ_{α}=14 keV (1973Jo01), Γ_n/Γ_{α}=10 (1957Wa46) and Γ_n/Γ>0.95 (1966Li03). J^{π}: See also (1966Li03,1967Jo12,1973Fo11).
8058 *8*	3/2+[@]	85[a f] keV *9*	2[h]	4162 *8*	E(level): from E_n=4162 keV *8* (1973Fo11). See also E_n(keV)=4200 *10* (1960Ts02), 4175 *10* (1966Li03), 4180 (1967Jo12), 4200 (1961Fo07). Γ: See also Γ(keV)=75 *20* (1966Li03), 80 (1961Fo07) and 70 (1957Wa46), Γ_n=71 keV and Γ_{α}=15 keV (1973Jo01), Γ_n/Γ_{α}=10 (1957Wa46) and Γ_n/Γ>0.90 (1966Li03). J^{π}: See also (1966Li03,1967Jo12).
8179 *20*	1/2⁻[@]	69[a] keV *7*		4290 *20*	E(level): from E_n=4290 keV *20* (1973Fo11). Γ: See also Γ_n=68 keV and Γ_{α}=0.8 keV (1973Jo01).
8207 *10*	3/2⁻[@]	52 keV	1[h]	4320 *14*	E(level): from E_n=4320 keV *10*, which is the average of (1960Ts02: 4330 keV *10*) and (1973Fo11: 4310 keV *10*). See also E_n=4320 keV (1961Fo07). Γ: Deduced, in part, from (1961Fo07). See also Γ≈90 keV (1960Ts02), 60 keV (1957Wa46,1961Fo07), Γ_n=48 keV and Γ_{α}=4 keV (1973Jo01) and Γ_n/Γ_{α}=13 (1957Wa46).
8341.70 *26*	1/2	11.4[b] keV *5*	1	4463.41 *26*	E(level): from E_n=4463.41 keV *26* (1980Ci03). See also E_n(keV)=4400 *40* (1958Hu18), 4400 (Ba52,1958Hu18), 4470 (1960Ts02: group), 4450 (1964St25), 4440 (1956Be98). Γ: See also Γ=18 keV (1957Wa46), Γ_{lab}=280 keV *80* (1958Hu18), 280 keV (Ba52), Γ_n=10 keV and Γ_{α}=2.2 keV (1973Jo01), Γ_n/Γ_{α}=6.7 (1957Wa46) and Γ_{n0}=8.1 keV *3* (1980Ci03). J^{π}: See (Ba52,1958Hu18,1964St25,1973Jo01). L: from (1958Hu18,1964St25).
8401.63 *7*	5/2+[@]	6.17[b] keV *13*		4527.12 *7*	E(level): from E_n=4527.12 keV *7* (1980Ci03). See also E_n=4530 keV (1956Be98,1961Fo07). Γ: See also Γ≤10 keV (1961Fo07), 11 keV (1957Wa46), Γ_n=4.8 keV and Γ_{α}=0.54 keV (1973Jo01), Γ_n/Γ_{α}=19 (1957Wa46) and Γ_{n0}=4.75 keV *11* (1980Ci03).
8465.32 *9*	7/2+[@]	2.13[b] keV *11*		4594.83 *9*	E(level): from E_n=4594.83 keV *9* (1980Ci03). See also E_n(keV)=4625 *10* (1960Ts02), 4600 (1961Fo07), 4590 (1956Be98).

Continued on next page (footnotes at end of table)

^{16}O(n,n),(n,n′) 1973Jo01,1981Hi01 (continued)

^{17}O Levels (continued)

E(level)[†]	J^{π}	Γ[‡]	E_n(res) (keV)	Comments
				Γ: See also Γ≤11 keV (1961Fo07), 9 keV (1957Wa46: doublet), Γ_α=7.6 keV (1973Jo01), Γ_n/Γ_α=31 (1957Wa46) and Γ_{n0}=1.18 keV *4* (1980Ci03).
8500.08 *12*	5/2⁻[@]	6.89[b] keV *22*	4631.78 *12*	E(level): from E_n=4631.78 keV *12* (1980Ci03). See also E_n(keV)=4705 *10* (1960Ts02), 4630 (1956Be98), 4640 (1961Fo07). Γ: See also Γ≤13 keV (1961Fo07), 11 keV (1957Wa46), Γ_n=3.4 keV and Γ_α=1.9 keV (1973Jo01), Γ_n/Γ_α=2.8 (1957Wa46) and Γ_{n0}=2.86 keV *8* (1980Ci03).
8686.4 *4*	3/2⁻[@]	55.3[b] keV *6*	4829.9 *4*	E(level): from E_n=4829.9 keV *4* (1980Ci03). See also E_n=4845 keV *10* (1960Ts02), 4840 (1961Fo07), 4850 (1956Be98). Γ: See also Γ(keV)≈90 (1960Ts02), 55 (1961Fo07), 85 (1957Wa46: triplet), Γ_n=42 keV and Γ_α=1.8 keV (1973Jo01), Γ_n/Γ_α=17 (1957Wa46) and Γ_{n0}=48.9 keV *11* (1980Ci03).
8856 *10*		<20 keV	5010 *10*	E(level),Γ: from (1960Ts02: 5010 keV *10*). See also 5080 (1956Be98). E(level): In past evaluations, information from ^{16}O(n,α) and ^{13}C(α,n) is peppered into the ^{16}O(n,n) dataset. It is usually harmless; however, in the present case we associate the 8856 keV level with the narrow (7/2⁻,9/2⁻) member of the E_x=8.9 MeV doublet. The broad 3/2⁺ member of this doublet is not reported in (n,n′). The Γ_n=68 keV and Γ_α=9.7 keV (1973Jo01), and Γ≈110 keV and Γ_n/Γ_α=3.5 (1957Wa46), etc. parameters accociated with E_x=8.9 MeV; J^π=3/2⁺ are from ^{16}O(n,α) and ^{13}C(α,n) (1957Wa46,1973Ba10).
8965.9 *16*	7/2⁻[@]	26.3[b] keV *19*	5127.0 *16*	E(level): from E_n=5127.0 keV *16* (1980Ci03). See also E_n(keV)=5122 *4* (1969Da13), 5110 (1961Fo07), 5130 (1956Be98). Γ: See also Γ(keV)=28 (1961Fo07), 35 (1957Wa46), Γ_n=23 keV and Γ_α=2.3 keV (1973Jo01), Γ_n/Γ_α=35 (1957Wa46) and Γ_{n0}=23.5 keV *19* (1980Ci03).
9176	≥3/2[c]	≤17[c] keV	5350	E(level): from E_n=5350 keV (1961Fo07). See also E_n=5380 keV (1956Be98).
9193.47 *9*		3.53[b] keV *13*	5368.90 *9*	E(level): from E_n=5368.90 keV *9* (1980Ci03). Γ: see also Γ_{n0}=2.37 keV *8* (1980Ci03).
9420	3/2⁻[@]	120 keV	5610	E(level): from E_n=5610 keV (1973Jo01). See also E_n=5630 keV (1961Fo07). Γ=Γ_n=120 keV (1973Jo01). See also 140 keV (1961Fo07).
9711.57 *14*	≥5/2[c]	23.1[b] keV *3*	5919.67 *14*	E(level): from E_n=5919.67 keV *14* (1980Ci03). See also E_n(keV)=5914 *5* (1969Da13), 5900 (1961Fo07). Γ: See also Γ=28 keV (1961Fo07) and Γ_{no}=18.0 keV *6* (1980Ci03).
9783.07 *15*	≥3/2[c]	11.7[b] keV *3*	5995.68 *15*	E(level): from E_n=5995.68 keV *15* (1980Ci03). See also E_n=5990 keV (1961Fo07). Γ: See also Γ=28 keV (1961Fo07) and Γ_{n0}=10.3 keV *3* (1980Ci03).
9858.70 *15*	(5/2⁻)[b]	4.01[b] keV *23*	6076.08 *15*	E(level): from E_n=6076.08 keV *15* (1980Ci03). Γ: See also Γ_{n0}=3.37 keV *20* (1980Ci03).
9876.3 *10*	(1/2⁻)[b]	16.7[b] keV *17*	6094.8 *10*	E(level): from E_n=6094.8 keV *10* (1980Ci03). See also E_n=6080 keV (1961Fo07). Γ: See also Γ=25 keV (1961Fo07) and Γ_{n0}=10.9 keV *12* (1980Ci03).
10167.7 *5*	(7/2⁻)[b]	49.1[b] keV *8*	6404.6 *5*	E(level): from E_n=6404.6 keV *5* (1980Ci03). See also E_n(keV)=6395 *7* (1969Da13), 6390 (1961Fo07).

Continued on next page (footnotes at end of table)

^{16}O(n,n),(n,n′) 1973Jo01,1981Hi01 (continued)

^{17}O Levels (continued)

E(level)[†]	J^π	Γ[‡]	E_n(res) (keV)	Comments
				Γ: See also Γ=38 keV (1961Fo07) and Γ_{n0}=22.3 keV *6* (1980Ci03).
10559.2 *6*	7/2⁻	42.5[b] keV *11*	6820.7 *6*	E(level): from E_n=6820.7 keV *6* (1980Ci03). See also E_n(keV)=6807 *7* (1969Da13), 6830 (1959Ha13), 6790 (1961Fo07), 6860 (1970Lu16). Γ: See also Γ=40 keV (1961Fo07) and Γ_{n0}=17.2 keV *7* (1980Ci03). J^π: from (1970Lu16). See also (1980Ci03).
10794			7070	E(level): from E_n=7070 keV (1959Ha13). See also E_n=(7080) keV (1970Lu16).
10915.3 *13*	(5/2⁺)[b]	41.7[b] keV *14*	7199.3 *13*	E(level): from E_n=7199.3 keV *13* (1980Ci03). See also E_n(keV)=7200 *8* (1969Da13), 7200 (1970Lu16), 7180 (1961Fo07). Γ: See also Γ=70 keV (1961Fo07) and Γ_{n0}=26.4 keV *9* (1980Ci03).
10954			7240	E(level): from E_n=7240 keV (1959Ha13).
11078.98 *18*	1/2⁻[e]	2.4 keV *3*	7373.31 *18*	T=3/2 (1976Mc11,1981Hi01) E(level): from E_n=7373.31 keV *18* (1980Ci03,1981Hi01); see also E_n=7400 keV (1959Ha13), 7440 keV (1970Lu16). See also E_x=11076 keV *5* (1976Mc11: ^{13}C(α,n)). Γ: from (1980Ci03,1981Hi01). See also Γ=5.0 keV *11* (1976Mc11) and Γ_{n0}=1.88 keV *12* (1980Ci03,1981Hi01).
11515	≥3/2[c]	190[c] keV	7837	E(level): from E_n=7837 keV, which is the average of (1961Fo07: 7810 keV), (1959Ha13: 7870 keV) and (1970Lu16: 7830 keV). J^π: See also (3/2,5/2) (1970Lu16).
11974	≥3/2[c]	270[c] keV	8325	E(level): from E_n=8325 keV, which is the average of (1959Ha13: 8350 keV) and (1961Fo07: 8300 keV).
12139			8500	E(level): from E_n=8500 keV (1959Ha13).
12346		130[c] keV	8720	E(level): from E_n=8720 keV (1961Fo07).
12467.0 *6*	3/2⁻[e]	6.9 keV *11*	8848.8 *6*	T=3/2 (1976Mc11,1981Hi01) E(level): from E_n=8848.8 keV *6* (1980Ci03,1981Hi01). See also E_n=8840 keV (1959Ha13); E_x=12458 keV *5* (1976Mc11: ^{13}C(α,n)). Γ: from (1980Ci03,1981Hi01). See also Γ=8 keV *2* (1976Mc11) and Γ_{n0}=1.27 keV *14* (1980Ci03,1981Hi01).
12670		95[c] keV	9065	E(level): from E_n=9065 keV, which is the aveage of (1959Ha13: 9100 keV) and (1961Fo07: 9030 keV).
12941 *6*	1/2⁺[e]	6[e] keV *2*	9353 *6*	T=3/2 (1976Mc11,1980Hi01) E(level): from E_n=9353 keV *6* (1981Hi01). See also E_n=9340 keV (1959Ha13); E_x=12944 keV *6* (1976Mc11: ^{13}C(α,n)). Γ: See also Γ_{n0}=0.21 keV *14* (1981Hi01).
12999.5 *6*	5/2⁻[e]	2.5 keV *10*	9414.9 *6*	T=3/2 (1976Mc11,1981Hi01) E(level): from E_n=9414.9 keV *6* (1980Ci03,1981Hi01). See also E_x=12993 keV *6* (1976Mc11: ^{13}C(α,n)). Γ: from (1980Ci03,1981Hi01). See also Γ≤3 keV (1976Mc11) and Γ_{n0}=0.40 keV *6* (1980Ci03,1981Hi01).
13636.9 *24*		9[d] keV *5*	10092.5 *24*	T=3/2 (1981Hi01) E(level): from E_n=10092.5 keV *24* (1981Hi01). Γ: See also Γ_{n0}=0.24 keV *9* (1981Hi01).
13644		400[c] keV	10100	E(level): from E_n=10100 keV (1961Fo07).
14232.3 *15*	(7/2⁻)[d]	20.5 keV *16*	10725.5 *15*	T=3/2 (1981Hi01) E(level): from E_n=10725.5 keV *15* (1980Ci03,1981Hi01). Γ: from (1980Ci03,1981Hi01). See also Γ_{n0}=2.07 keV *16* (1980Ci03,1981Hi01).

Continued on next page (footnotes at end of table)

^{16}O(n,n),(n,n′) 1973Jo01,1981Hi01 (continued)

^{17}O Levels (continued)

E(level)[†]	J^{π}	Γ[‡]	E_n(res) (keV)	Comments
				Γ: from (1980Ci03,1981Hi01). See also Γ_{n0}=2.07 keV *16* (1980Ci03,1981Hi01).
14288 *3*		7.5[d] keV *4*	10785 *3*	T=3/2 (1981Hi01) E(level): from E_n=10785 keV *3* (1981Hi01). Γ: See also (J±1/2)Γ_{n0}=0.80 keV *16* (1981Hi01).
14453 *3*		40[d] keV *6*	10960 *3*	E(level): from E_n=10960 keV *3* (1981Hi01). Γ: See also (J±1/2)Γ_{n0}=13 keV *6* (1981Hi01).
14585	(≥3/2)[c]	340[c] keV	11100	E(level): from E_n=11100 keV (1961Fo07).
14793 *3*	$1/2^-$[d]	36[d] keV *13*	11322 *3*	T=3/2 (1981Hi01) E(level): from E_n=11322 keV *3* (1981Hi01). Γ: See also (J±1/2)Γ_{n0}=3.2 keV *10* (1981Hi01).
14961		180[c] keV	11500	E(level): from E_n=11500 keV (1961Fo07).
15202 *3*	(3/2)[d]	52[d] keV *14*	11756 *3*	T=3/2 (1981Hi01) E(level): from E_n=11756 keV *3* (1981Hi01). Γ: See also (J±1/2)Γ_{n0}=11 keV *3* (1981Hi01).
15371 *3*	≤5/2[d]	40[d] keV *6*	11936 *3*	T=3/2 (1981Hi01) E(level): from E_n=11936 keV *3* (1981Hi01). Γ: See also (J±1/2)Γ_{n0}=7 keV *1* (1981Hi01).
16247 *4*	$(7/2^+,9/2^+)$[d]	21[d] keV *10*	12867 *4*	T=3/2 (1981Hi01) E(level): from E_n=12867 keV *4* (1981Hi01). Γ: See also (J±1/2)Γ_{n0}=2.0 keV *5* (1981Hi01).
17441 *11*		66[d] keV *20*	14136 *11*	T=3/2 (1981Hi01) E(level): from E_n=14136 keV *11* (1981Hi01). Γ: See also (J±1/2)Γ_{n0}=8.0 keV *24* (1981Hi01).
18115 *4*		46 keV *12*	14853 *4*	T=3/2 (1981Hi01) E(level): from E_n=14853 keV *4* (1981Hi01). Γ: from (1981Hi01: Table 1). See also Γ=43 keV *12* (1981Hi01: Table 2), Γ_{n0}=1.9 keV *6* (1981Hi01: Table 1) and (J±1/2)Γ_{n0}=1.0 keV *3* (1981Hi01: Table 2).
20417	$(1/2^+)$		17300	T=(1/2) (1970Bo30) E(level): from E_n=17300 keV (1970Bo30). Γ: Γ_n≈700 keV (1970Bo30). J^{π}: from (1970Bo30).

† Level energies are deduced using E_n(res) and *n*, ^{16}O and ^{17}O mass excesses from (2021Wa16: AME-2020) where E_n(res) is listed. $E_x=S_n+M(^{16}O)/(M_n+M(^{16}O))*E_n(res)$.

‡ Γ, Γ_n and Γ_α are in c.m. system except where noted. Γ_α from (1973Jo01) are to fit (n,α) cross sections of (1973Ba10) normalized (×0.8).

\# Γ_{lab} from (Ar60: Armstrong, et al., Bull. Amer. Phys. Soc. II, 5, 247 (1960)). The values are presented in (FAS61: Ajzenberg-Selove and Lauritsen, Energy Levels of Nuclei: A=5 to A=257, Vol. 1, p. 1-59 (1961)) and later in (1958Hu18). Values in (FAS61) are given in the cm system, while the Γ_n values of (1958Hu18) represent the lab width of the state.

@ From (1973Jo01).

& Also observed in (1970Fo03).

a From (1973Fo11).

b from (1980Ci03).

c from (1961Fo07).

d from (1981Hi01).

e from (1976Mc11).

f We adopt the careful R-matrix analysis of (1973Fo11,1973Jo01), which considers the interference of the E_{res}(keV)=3250 *10* and

Continued on next page (footnotes at end of table)

^{16}O(n,n),(n,n′) 1973Jo01,1981Hi01 (continued)

^{17}O Levels (continued)

4162 *8* $J^{\pi}=3/2^{+}$ levels. A different set of level parameters is given in (1966Li03).

[g] From (1970Fo03).

[h] From (1967Jo12).

^{16}O(n,α) 1963Da12

1963Da12: ^{16}O(n,α), E=5.0-8.8 MeV; the excitation function showed 21 resonances corresponding to excited states in ^{17}O.
1968Le11: ^{16}O(n,α), E=14.9 MeV measured σ(Eα,θ). Natural targets.
1969AjZZ: ^{16}O(n,α), E=14 MeV; measured σ(Eα,θ).
1970Aj03: ^{16}O(n,α), E=14 MeV; measured σ(Eα,θ).
1970Br17: ^{16}O(n,α), E=13.9 MeV; measured σ(E_n; θ=0°).
1972Br50: ^{16}O(n,α), E=13.9 MeV; measured σ(Eα).
1972Ki12: ^{16}O(n,α), E=4.9 MeV; measured σ(θ).
1973Bo26: ^{16}O(n,α), E=14.1 MeV; measured σ(Eα,θ).
1979SuZR: ^{16}O(n,p),(n,d),(n,t),(n,^{3}He),(n,α), E=27.4,39.7,60.7 MeV; measured σ(E,θ); deduced reaction mechanism. Hauser-Feshbach calculation.
2002NeZY: ^{16}O(n,n′),(n,2n),(n,p),(n,d),(n,α),(n,nα), E=4-200 MeV; measured Eγ, Iγ, σ(θ), excitation functions. Comparison with previous results.
2008GiZY: ^{16}O(n,α), E=3.95-9 MeV; measured Eα, Iα; deduced σ(E*). Compared to other data, ENDF/B-VI.8, ENDF/B-VII.0.
2011KhZW: ^{16}O(n,α), E=1.7-7 MeV; measured Eα, Iα using digital spectrometer; deduced σ to low-lying states. Comparison with other data, O and N reactions also to ENDF/B-VII.
2012Kh05: ^{16}O(n,α), E<7.5 MeV; measured reaction products, Eα, Iα; deduced σ. Comparison with available data, ENDF/B-VII and JENDL libraries.
2012KhZZ: ^{16}O(n,α), E=1.7-7 MeV; re-evaluated σ to ground state at neutron energies between 4 and 6.2 MeV. Compared with other data, ENDF/B-VII, JENDL3.
2018Sc04: ^{16}O(n,n),(n,n′),(n,α), E=1-10 MeV; measured reaction products, E_n, I_n; deduced light and heavy water leakage neutron flux density, neutron fluences for the light and heavy water spheres. Comparison with calculations using ENDF/B-VII.0, ENDF/B-VIII.b4 and JENDL-4 nuclear data libraries.

Theory:
1972JoZV: ^{16}O(n,n),(n,α), E=600-930, 1390-1640 keV; measured σ(nT). ^{17}O deduced resonances, level-width.
1973Jo01: ^{16}O(n,X),(n,α), E<5.8 MeV; analyzed σ(E). ^{17}O deduced resonances, J, π, level-width, S.
1986Sh33: ^{16}O(n,n),(n,n′),(n,α), E=threshold−20 MeV; compiled, evaluated neutron induced reaction data. R-matrix theory, direct, preequilibrium processes.
1986Sh33: ^{16}O(n,n),(n,n′),(n,α), E=threshold−20 MeV; compiled, evaluated neutron induced reaction data. R-matrix theory, direct, preequilibrium processes.
1989Br05: ^{16}O(n,α), E=15-60 MeV; calculated σ(θ1,E1).
1995Ch84: ^{16}O(n,n),(n,α), E=6.2-10.5 MeV; analyzed σ, σ(θ); deduced R-matrix parameters.
2008Su21: ^{16}O(n,α), E<30 MeV; calculated kerma coefficients. Comparison with experimental data.
2008VaZT: ^{16}O(n,α), E≈3-10 MeV; calculated σ; evaluated σ. JENDL-3.3, ENDF/B-VI.8.
2008WaZS: ^{16}O(n,α), E=96 MeV; calculated dσ; QMD plus generalized evaporation model; compared to data.
2014Ku13: ^{16}O(n,α), E=0.5-4.7 MeV; calculated σ using multi-channel R-matrix with care for covariances; deduced resonances. Compared to ENDF/B-VII.1 and Harisopulos data.
2016LeZV: ^{16}O(n,α), E=3.3-7.0 MeV; calculated σ, σ(θ) to specified resonances (partially by G. Hale) using R-matrix.
2017HaZY: ^{16}O(n,n),(n,x),(n,α), E=0-7 MeV; calculated total σ, σ(θ); compared with data and ENDF VIII.0-CIELO.
2017Ka02: ^{16}O(n,α), E=1-100 MeV; calculated preformation probability vs fragment mass using collective clustering approach of DCM (Dynamical Cluster-decay Model). Compared with available data.

^{17}O Levels

E(level)†	Γ‡	E_{res} (keV)‡	E(level)†	Γ‡	E_{res} (keV)‡
8894	≈91 keV	5050	9862	28 keV	6080
8959	≈30 keV	5120	9994	143 keV	6220
9147	≈24 keV	5320	10173	81 keV	6410
9195	52 keV	5370	10342	148 keV	6590
9486	56 keV	5680	10549	79 keV	6810
9712	51 keV	5920	10765	69 keV	7040

Continued on next page (footnotes at end of table)

^{16}O(n,α) 1963Da12 (continued)

^{17}O Levels (continued)

E(level)†	Γ‡	E_{res} (keV)‡	E(level)†	Γ‡	E_{res} (keV)‡
10916	79 keV	7200	11725?		(8060)
11029	≈57 keV	7320	11875	≈125 keV	8220
11283	≈78 keV	7590	12026	≈125 keV	8380
11471?		(7790)	12289		8660
11574	≈126 keV	7900			

† Level energies are deduced using E_n(res) and *n*, ^{16}O and ^{17}O mass excesses from (2021Wa16: AME-2020) where E_n(res) is listed. $E_x=S_n+M(^{16}O)/(M_n+M(^{16}O))*E_n(res)$.

‡ From (1963Da12).

^{16}O(n,γ):E=thermal 2016Fi04

1979Wu05: ^{16}O(n,γ), E=thermal; measured σ for double-photon emission, σγ.
2008FiZZ: ^{16}O(n,γ), E=thermal; measured cross sections; compared experimental and calculated depopulation.
1977Mc05: ^{16}O(n,γ), E=th; measured σ(Eγ); deduced upper limit for σ(2γ). ^{17}O levels deduced γ-branching. Enriched target. Target $J^\pi=0^+$. Measured Eγ and Iγ, γ-production. They reported Iγ(1088)=82 *3* and Iγ(3271)=18 *3*. Evaluated S(n)=4143.33 keV *21* (1995Au04).
2016Fi04: XUNDL datasetbcompiled by TUNL, 2016 ENSDF formatted tables provided by R.B. Firestone (LBNL).
The authors measured thermal neutron capture reactions on several natural and enriched isotopic targets, normalized to a limited set of standard targets, with the aim of improving absolute capture cross sections and transition probabilities.
In separate measurements beams of $E_{thermal}$ neutrons, from the 10-MW Budapest Reactor or the Forschungs-Neutronenquelle Heinz Maier-Leibnitz reactor, impinged on 99.9% deuteron enriched D_2O targets with natural, 50.1% ^{16}O and 58.5% ^{16}O abundances. The capture γ rays were measured using a single Compton suppressed HPGe detector that was 60% efficient relative to a 3 inch×3 inch NaI detector. The relative intensities of the capture γ rays were determined and normalized primarily to the known capture cross sections of ^{16}O(n,$\gamma_{870.67}$) (σ_γ=0.164±0.003 mb), which was cross referenced to other secondary cross sections determined for capture reactions on ^{1}H, ^{12}C or ^{14}N.
The observed γ-ray transitions were analyzed by deducing a level scheme and performing a least-squares fit to obtain precise level energies. The transition probabilities and cross sections were deduced by balancing the intensity feeding and deexciting each state.
Lastly, the present results are compared with literature results, particularly for the capture cross section and the neutron separation energy. S_n=4143.27 keV *13* is deduced.
σ=170 μb *3*, χ^2/f=0.741, 5 γ-rays.

Theory:
^{16}O(n,γ).
1976Le27: ^{16}O(n,γ), E=thermal; calculated σ(2γ), σ(2γ)/σ(γ).
2002Re13: ^{16}O(n,γ), E=thermal; compiled, analyzed prompt Eγ, Iγ.
2011Sl01: ^{16}O(n,γ), E=thermal; compiled, evaluated σ, σ(Eγ), γ decay schemes, levels, J, π using ENDF, DICEBOX.

^{17}O Levels

E(level)†	Jπ‡	$T_{1/2}$‡
0.0	5/2+	stable
870.78 *8*	1/2+	179.6 ps
3055.37 *12*	1/2−	110 fs
(4143.27 *13*)	1/2+	

† Reported in (2016Fi04).
‡ From Adopted Levels.

γ(^{17}O)

Eγ†	Iγ†‡	E_i(level)	J^π_i	E_f	J^π_f	Mult.	α#
870.76 *4*	96.6 *5*	870.78	1/2+	0.0	5/2+	E2	8.85×10^{-6} *13*
1087.89 *4*	80.4 *5*	(4143.27)	1/2+	3055.37	1/2−	E1	2.31×10^{-6} *4*
2184.49 *5*	80.4 *5*	3055.37	1/2−	870.78	1/2+	E1	0.00077 *1*
3272.02 *8*	16.2 *4*	(4143.27)	1/2+	870.78	1/2+	M1	0.00076 *1*
4142.6 *6*	3.36 *24*	(4143.27)	1/2+	0.0	5/2+	E2	0.00122 *2*

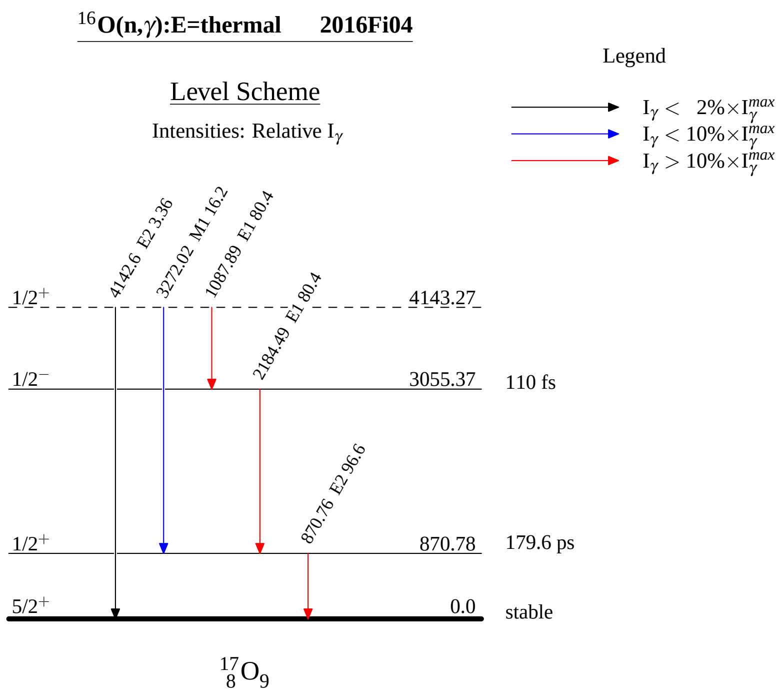
† The measured γ-ray energies and the observed γ-ray intensities. In (2016Fi04), the figures show the experimental γ-ray energies and the transition probabilities (accounting for internal conversion). Similarly, the tables show γ-ray energies associated with the level scheme deduced from a least-squares fit to the measured transition energies along with the measured γ-ray transition

Continued on next page (footnotes at end of table)

^{16}O(n,γ):E=thermal **2016Fi04** (continued)

γ(^{17}O) (continued)

intensities.
‡ Intensity per 100 neutron captures.
# Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.



^{16}O(p,π^+) 1988Hu02

1974Da23: ^{16}O(p,π^+), E=185 MeV; measured σ(E(π^+),θ). ^{17}O deduced levels.
1979Ma38: ^{16}O(p,π^+), E=0.5-10 MeV above threshold; measured σ.
1979Ma39: ^{16}O(p,π^+), E=8-16 MeV above threshold; measured inclusive σ; deduced A-dependence.
1979PiZU: ^{16}O(p,π^+), E=140-175 MeV; measured $\sigma(\theta)$. QDDM spectrograph.
1979SoZY: ^{16}O(p,π^+), E=200 MeV; measured σ(Eπ).
1981Sj02: ^{16}O(pol. p,π^+), E=147-159 MeV; measured $\sigma(\theta)$, analyzing power vs θ.
1981Sj03: ^{16}O(p,π^+), E=149-166 MeV; measured $\sigma(\theta)$. DWBA analysis, stripping model.
1987AzZZ: ^{16}O(p,π^+),(pol. ,π^+), E=200 MeV; measured $\sigma(\theta)$, analyzing power vs θ. ^{17}O deduced levels, configuration.
1987HuZY: ^{16}O(pol. p,π^+), E=200-489 MeV; measured $\sigma(\theta)$, analyzing powers.
1988AzZZ: ^{16}O(pol. p,π^+), E=200 MeV; measured $\sigma(\theta)$, analyzing power vs θ. ^{17}O deduced levels, J, π, t, configuration.
1988Hu02: ^{16}O(pol. p,π^+), E=250,354,489 MeV; measured $\sigma(\theta)$, analyzing power vs θ; deduced similarities to nucleon-nucleon interation pion production.
1988Hu06: ^{16}O(pol. p,π+X), E=250,354,489 MeV; measured inclusive $\sigma(\theta(\pi)$, E(π)), analyzing power vs missing four momentum squared; deduced comparisons with elementary pp→dπ^+ reaction, implications for the pion production mechanism.

Theory:
1973Ei01,1973Ei05: ^{16}O(p,π^+), E=600 MeV; calculated σ.
1974Mi06: ^{16}O(p,π^+), E=185 MeV; calculated $\sigma(\theta$,E(πi$^+$)).
1977Br01: ^{16}O(p,π^+), E=150-190 MeV; calculated σ(E).
1978Yo02: ^{16}O(pol. p,π^+), E=200 MeV; calculated asymmetry.
1981Co18: ^{16}O(pol. p,π^+), E=160 MeV; calculated analyzing power vs θ.
1982Co07: ^{16}O(pol. p,π^+), E=157 MeV; caculated $\sigma(\theta)$, A(θ); E=185,165,157,154 MeV; calculated $\sigma(\theta)$. DWBA, Dirac equation, different pion-nucleon verticies.
1986Co20: ^{16}O(p,π^+),(pol. ,π^+), E=350 MeV; calculated $\sigma(\theta)$, analyzing power vs θ. Relativistic stripping model, isobar resonance region.
1989Co04: ^{16}O(p,π^+), E=200 MeV; calculated $\sigma(\theta)$. High intermediate momenta suppression.
1992Be37: ^{16}O(pol. p,π^+), E=200-354 MeV; calculated $\sigma(\theta)$, analyzing power vs θ; deduced Δ-isobar role. Microscopic model.
1995Kr11: ^{16}O(p,π^+), E=489,800 MeV; calculated $\sigma(\theta)$. Impulse approximation, momentum space, relativistic wave functions.
1995Kr12: ^{16}O(p,π^+), E=800 MeV; calculated $\sigma(\theta)$.
1995Sh10: ^{16}O(p,π^+), E=800 MeV; calculated $\sigma(\theta)$. Fully convariant two-nucleon model.
2017Ol06: ^{16}O(p,π^+), E=3,25 GeV; analyzed available data; deduced partial inelasticity coefficients of fragments, σ.

^{17}O Levels

E(level)[†]	J^π	Comments
0[‡@&a]	5/2+[#]	
871[‡&a]		
3055[&]		
3841[‡&]		
4552[&]		
5.08×10^3[&]		E(level): Not reported in (1988Hu02).
5218[@]	(9/2$^-$)[#]	
5733		
6356		
6972		
7379		
7757[@]	11/2$^-$[#]	
8200		
8466?		
8967		

Continued on next page (footnotes at end of table)

$^{16}O(p,\pi^{+})$ 1988Hu02 (continued)

^{17}O Levels (continued)

E(level)[†]	E(level)[†]	E(level)[†]	J^{π}
9.15×10^{3}?	12274	14.76×10^{3}[@]	
9783	13484	15.78×10^{3}	$(13/2^{-})$[#]
11238	14.15×10^{3}[@]	17.1×10^{3}	$(7/2^{-})$[#]

[†] From Fig. 2 of (1988Hu02).
[‡] reported in (1974Da23).
[#] From (1988Hu02).
[@] Reported in (1987AzZZ,1988AzZZ).
[&] Reported in (1979Ma38).
[a] Reported in (1981Sj02,1981Sj03).

^{16}O(d,p),(d,pγ) 1990Pi05,1957Br82

1952Th24: ^{16}O(d,p), E=1-2 MeV; the γ-ray energies and intensities are determined from the photoelectric and Compton conversion processes.

1953Th14: ^{16}O(d,p), lifetime Measurements for the first excited states of ^{17}O.

1954Sp01: ^{16}O(d,p), E=5-8.5 MeV; ^{17}O levels were identified.

1955Gr68: ^{16}O(d,p), E=1.1-2.4 MeV; measured reaction products, Ep, Ip; deduced $\sigma(\theta)$.

1955Kh35: ^{16}O(d,p), investigation of the energy levels of the light nuclei by magnetic analysis.

1956Gr37: ^{16}O(d,p), E=9 MeV; angular distributions have been measured.

1957Br82: Excitation energies and widths of ^{17}O were measured from E_d=6.5-7.5 MeV bombardment of thin targets of solid oxide on Formvar backings (either metallic Li or iron was evaporated and then oxidized or SiO_2 was evaporated directly) at θ=30°, 60°, 70°, and 90° with respect to the incoming beam. Outgoing particles were identified based on the observed change in energy of the emitted particles with a change in bombarding energy or observation angle and a comparison of the spectra from the different target materials. The 0.87-MeV level was found to be single rather than double as recently suggested. Disagreements among other experiments concerning the ^{17}O levels were also explained in terms of the large difference in level widths.

1959Lo59: Important differences from results predictd by Butler theory have been observed in angular distribution of the ^{16}O(d,p) reaction, specially when the incident deuteron energy is near 1.7 MeV.

1960Al35: ^{17}O; measured not abstracted; deduced nuclear properties.

1960Go20: ^{17}O; measured not abstracted; deduced nuclear properties.

1961Ke01: The reactions ^{16}O(d,p)^{17}O and ^{16}O(d,t)^{15}O were studied by bombarding thin nickel oxide foils with 15-Mev deuterons from the University of Pittsburgh cyclotron. The emitted particles were magnetically analyzed and detected either by nuclear emulsions or by a CsI(Tl) scintillator. Absolute cross sections and angular distributions were measured for the first 6 states of ^{17}O and for the $^{15}O_{g.s.}$ state. Reduced width values Θ^2 were extracted. The experimental results indicated that 3.846-MeV state was not a $1f_{7/2}$ single-particle state, the $2p_{3/2}$ single-particle component was fragmented over more than two states, and 3.058-MeV state contained a $2p_{1/2}$ single-particle component.

1963Ya03: The experiment was carried out in Tokyo/the INS 160 cm cyclotron from E_d=14.95 MeV bombardment of an enriched tungsten oxide target (90%^{18}O, 1.1%^{17}O, 8.9%^{16}O) with thickness of 0.28 mg/cm^2. Emitted protons were detected and analyzed by a broad range magnetic spectrograph with four nuclear emulsion plates (Sakura Iγ normalization-MI, 50μm). Absolute cross sections were measured and angular distributions (measured at 14 angles in θ_{lab}=13°−140°) were analyzed to determine reduced withds (θ^2) using the Butler-Born theory. Parameters of energy levels of ^{17}O*(0, 0.871, 3.058, 3.846, 4.555, 5.083, 5.378, 5.697 MeV were extracted.

1964Ki05: ^{16}O(d,p), E=786 keV-1.7 MeV; measured σ(E,θ) for p_0, p_1.

1964Sc12: Absolute total cross sections of the reaction ^{16}O(d,p) were determined from the protons angular distributions measurement at θ=10°−165° with E_d=11.8 MeV. Reduced widths were calculated for the levels of ^{17}O*(0, 0.87, 3.06, 3.85 MeV).

1965Mo16: ^{16}O(d,p), E=5.56 MeV; measured σ(Ep,θ), Q. ^{17}O deduced levels. Enriched targets.

1966Ga09: ^{16}O(d,p), E=1.3, 4 MeV; measured σ(Ep,θ). ^{17}O deduced S.

1966Wi01: The energy of the ^{17}O 0.871-MeV γ-ray was measured with a lithium-drifted germanium detector using the ^{16}O(d,p)^{17}O reaction to populate the first excited state of ^{17}O. A result of 870.81 keV *22* was obtained using various radiactive sources for energy calibration.

1967Al06: ^{16}O(d,p), E=10-13 MeV; measured σ(E; Ep,θ). ^{17}O levels deduced S. Enriched ^{17}O target.

1968Di06: ^{16}O(d,p), E=2-3.5 MeV; measured σ(E; θ).

1968Ho23: ^{16}O(d,p), E=14.3 MeV; measured σ(Ep,θ); deduced reaction mechanism. Si detector, magnetic spectrograph.

1968Na06: ^{16}O(d,p), E_d=6.0-11.0 MeV; measured σ(E; Ep,θ). ^{17}O levels deduced S. Natural target.

1969Co12: ^{16}O(d,p), E=4.4-8.4 MeV; measured tensor polarization (θ), σ(E,θ). Natural target.

1969Du11: ^{16}O(d,p), E=0.35-1.05 MeV; measured σ(E; Ep,θ).

1969Go04: ^{16}O(d,p), E=1.2 MeV; measured pγ-delay. ^{17}O levels deduced $T_{1/2}$. Natural, enriched targets.

1970Da14: ^{16}O(d,p), E=4-6 MeV; measured σ(E; θ); deduced optical model parameters. ^{17}O levels deduced S.

1971Br44: ^{16}O(d,p), E=12.3 MeV; measured tensor analyzing power(θ).

1971Do13: ^{16}O(d,pγ), E=2,2.25,4.2 MeV; measured Doppler shift attenuation. ^{17}O levels deduced $T_{1/2}$.

1971Ko21: ^{16}O(pol. d,p), E_d=8 MeV; measured polarization parameters iT_{11}(Ed; Ep,θ), cross sections σ(Ed; Ep,θ); deduced J-dependence. ^{17}O deduced S. Natural targets.

1972Br12: ^{16}O(pol. d,p), E_d=12.3 MeV; measured vector analyzing power iT_{11}(θ,Ep). Natural O target.

^{16}O(d,p),(d,pγ) 1990Pi05,1957Br82 (continued)

1972Co15: ^{16}O(pol. d,p); measured cross section $\sigma(E_d,\theta)$, polarization parameters $iT_{11}(E_d,\theta)$, $T_{20}(E_d,\theta)$, $T_{21}(E_d,\theta)$, $T_{22}(E_d,\theta)$; E_d=9.3, 13.3 MeV. Cross sections and vector and tensor analysing powers have been measured for ^{16}O(d,$p_{0,1}$)17O*. Natural targets.

1972CoZE: ^{16}O(d,d),(d,p), E=25.4,36,63 MeV; measured $\sigma(\theta)$; deduced optical model parameters. ^{17}O deduced levels, S, Γ.

1972Sl10: ^{16}O(pol. d,p), E=2-3 MeV; measured vector analyzing power(E; θ).

1973Ca30: ^{16}O(d,p), E=0.98-1.97 MeV; measured σ(E; Ep,θ). ^{17}O levels deduced S.

1973Da17: ^{16}O(pol. d,p), E=9.3,13.3,15.0 MeV; measured polarization parameters iT_{11}(Ed,Ep,θ), cross sections σ(Ed,Ep,θ). ^{17}O deduced S, resonance widths. Natural targets.

1973Jo10: ^{16}O(pol. d,p), E=12.3 MeV; measured analyzing powers $iT_{11}(\theta)$, $T_{20}(\theta)$, $T_{22}(\theta)$, deduced importance of d-state effects using DWBA theory. ^{17}O deduced level J.

1974Co04: Deuteron beams at E=25.4, 36.0, and 63.2 MeV from the University of Maryland Cyclotron impinged on an ^{16}O gas target with pressure ≈1 atm. The ^{16}O gas temperature and pressure were monitored with an accuracy better than 0.2°C and 0.1 mm Hg respectively. The outgoing particles were detected with solid state detector ΔE-E telescopes with the energy resolution was ≈100 keV. Coincident ΔE and E signals were sent to 8192 channel ADC units interfaced with the computer and particles were identified. Optical potential parameters of levels of ^{17}O*(0, 0.87, 5.08 MeV) were deduced.

1979An15: ^{16}O(d,p), E=12 MeV; measured $\sigma(\theta)$. ^{17}O level deduced Γ_n. DWBA calculations for unbound states.

1980Da26: ^{16}O(d,p), E=0.97 MeV; measured σ.

1980Wa24: ^{16}O(d,pγ), E_d=2.51 MeV; measured $E_\gamma(1/2^+ \to 5/2^+)$.

1981Bo03: ^{16}O(d,p), E=698 MeV; measured $\sigma(\theta)$; deduced deuteron optical model parameters. DWBA, rescattering calculations.

1982Be64: ^{16}O(d,p), E=545.1-658.2 keV; measured products, ^{17}O, E_n, I_n; deduced $\sigma(\theta)$.

1985RoZV: ^{16}O(d,p),(pol. d,p), E=15,17 MeV; measured $\sigma(\theta)$, vector analyzing power vs θ. ^{17}O levels deduced excitation mechanism.

1990Ca32: ^{16}O(d,p), E≤1200 keV; measured γ-spectra, pγ-coin. High sensitivity analysis, other targets, data input.

1990Pi05: ^{16}O(d,p), E=12.3 MeV; measured Q, $\sigma(\theta)$. ^{17}O deduced levels. Natural targets.

1991Le36: ^{16}O(d,p), E=735 keV-1.1 MeV; deduced $\sigma(\theta)$.

1992La08: ^{16}O(d,p), E=650 keV; measured particle spectra. Rutherford backscattering spectroscopy, NRA, laser irradiated borosilicate glass surface examination.

1992Ma47: ^{16}O(d,p), E=1.4 MeV; measured yield; deduced GaAs crystal surface modifications during annealing.

1993Qu04: ^{16}O(d,p), E=857 keV; measured $\sigma(\theta)$.

1994Iv01: ^{16}O(d,p), E=1.437 MeV; measured emergent particle energy before, after Al foil absorption.

1994Le19: ^{16}O(d,p), E=825 keV; measured particle spectra, yield.

1995Ro28: ^{16}O(d,pγ), E=0.4-1.8 MeV; measured σ(E). ^{16}O(d,pγ), E=1.8 MeV; measured Eγ, Iγ. Ultrathin dielectric films with ion beams.

2000El08: ^{16}O(d,p), E=0.7-3.4 MeV; measured Eγ, Iγ; deduced thick target γ-ray yields.

2002Ku35: ^{16}O(d,p), E=400keV; measured proton spectra, angular distributions.

2003Ji11: ^{16}O(d,p), E=701 keV-3 MeV; measured products, deduced $\sigma(\theta)$.

2004Gu23: ^{16}O(d,p), E=700 keV-2.1 MeV; measured products, deduced $\sigma(\theta)$.

2006Sz07: ^{16}O(d,pγ), E=0.6-2 MeV; measured Eγ, Iγ; deduced γ-ray production σ, thin target yields.

2016Cs02: ^{16}O(d,pγ), E=0.7-3.4 MeV; measured reaction products, Eγ, Iγ; deduced $\sigma(\theta)$, thick target yields for γ-ray of a particular energy.

2016Ra06: ^{16}O(d,p), E=0.7-1.8 MeV; measured reaction products, Ep, Ip; deduced $\sigma(\theta)$. Comparison with available data.

2019Ma31: ^{16}O(d,p), E=15 MeV; measure the angular distribution, deduced the spectroscopic factor (SF) and the asymptotic normalization coefficient (ANC) for the ^{17}O ground state.

See also (2009Ts01,2014Jo02: theory).

Theory:

1961Bu16: ^{16}O(d,p), the analysis of (d,p) stripping reactions (DWBA).

1961Ja23: the systematic study of Q(β^-)value measurements for accurate mass/excitation states determination.

1962Ga16: Analysis of delayed coincidence lifetime measurements.

1963Sm05: Distorted-wave calculations of light nuclei (d,p) angular distributions.

^{16}O(d,p),(d,pγ) 1990Pi05,1957Br82 (continued)

1967Sc16: The influence of the non-locality in zero-range DWBA calculations of the ^{16}O(d,p)^{17}O and ^{18}O(p,p′) reactions is investigated.
1969Ic02: ^{16}O(d,p), E=10.5 MeV; calculated Q, S-matrix elements.
1970Bu16: ^{16}O(d,p), E not given; calculated $\sigma(\theta)$. DWBA.
1970Do10: ^{16}O(d,p), E=12,15,26 MeV; analyzed $\sigma(\theta)$. ^{17}O levels deduced S. Absorption model.
1970Ki15: ^{16}O(d,p), E=12-26 MeV; analyzed $\sigma(\theta)$. ^{17}O levels deduced S.
1970Oh06: ^{16}O(d,p), E=12 MeV; calculated $\sigma(\theta)$. Coupled channel theory.
1970Pe14: ^{16}O(d,p), E=7-15 MeV; analyzed $\sigma(\theta)$, P(θ), vector analyzing power(θ). ^{17}O levels deduced S.
1970Vi03: ^{16}O(d,p), E=12 MeV; calculated $\sigma(\theta)$.
1971Bo50: ^{16}O(d,p), E=26, 28 MeV; calculated $\sigma(\theta)$, peripheral model (Pm), DWBA.
1972Bu23: Verification of Distorted Wave Method for Stripping Reactions to Resonant State.
1972Dz06: Peripheral Model for a Stripping Reaction to a Resonant State.
1972Go04: Effects of Non-Orthogonality and Virtual Excitations in Direct Reactions (I).
1972Ph06: ^{16}O(d,p), E=14.3 MeV; calculated $\sigma(\theta)$.
1972Sc20: ^{16}O(d,p), E=12 MeV; calculated $\sigma(\theta)$, σ for bound, unbound states. DWBA.
1972Sc45: ^{16}O(d,p), E=12 MeV; calculated $\sigma(\theta)$.
1972Sh17: ^{16}O(d,p), E=12 MeV; analyzed $\sigma(\theta)$. Diffraction model, unbound states.
1973Ba74: ^{16}O(d,p), calculated $\sigma(\theta)$.
1973Cl09: ^{16}O(d,p), calculated S.
1973Do02: ^{16}O(d,p), E not given; analyzed $\sigma(\theta)$. ^{17}O deduced levels, J, π, level-width.
1973Me18: ^{16}O(d,p), E=12.3 MeV; calculated $T_{20}(\theta)$.
1973Wi05: ^{16}O(d,p), E=11.0 MeV; deduced S.
1974Ba19: ^{16}O(d,p), calculated $\sigma(\theta)$.
1974Co10: Spectroscopic factor for the 5.08-MeV state of ^{17}O was discussed in the ^{16}O(d,p) and ^{16}O(n,n) reactions.
1974Fo17: ^{16}O(d,p), E=12 MeV; calculated σ(Ep,θ), σ. ^{17}O resonance deduced n-width.
1974Go02: The DWBA ^{16}O(d,p) reaction cross sections.
1974Im01: ^{16}O(d,p), E=10.5 MeV; calculated σ(Ep,θ), $\sigma(\theta)$.
1975Co12: ^{16}O(d,p), E=10.5 MeV; calculated σ(Ep,θ).
1976Bo15: ^{16}O(d,p), E=13.3 MeV; calculated σ. Singularity subtraction method.
1976Bo48: ^{16}O(pol. d,p), E<4 MeV; analyzed vector analyzing power.
1976Co29: ^{16}O(d,p), E=10.49,14.8,20 MeV; calculated $\sigma(\theta)$. Folded-potential DWBA plus multistep contribution of rearranged intermediate channels, corrected for nonorthogonality. Surface approximation with separable Green function.
1976Sa04: ^{16}O(pol. d,p), E=6-13.3 MeV; calculated A(θ). Surface reaction model.
1976Sh13: ^{16}O(d,p), E=6-15 MeV; calculated $\sigma(\theta)$.
1977Gr20: ^{16}O(d,p), E=10.5 MeV; calculated σ(Ep,θ).
1977Mu04: ^{16}O(d,p), E=12-13.3 MeV; calculated σ(E). DWBA analysis.
1979Gr11: ^{16}O(d,p), E=10.49 MeV; calculated $\sigma(\theta)$. Channel coupling array theory.
1980Am02: ^{16}O(d,p), E=36 MeV; calculated $\sigma(\theta)$. DWBA, three-body model of inelastic scattering.
1980Ay01: ^{16}O(d,p), E=20, 45 MeV; ^{16}O(pol. d, p), E=20 MeV; calculated $\sigma(\theta)$, vector, tensor analyzing power vs θ. Three-body calculations, no Coulomb effects, separable interactions.
1980ChZJ: ^{16}O(d,p), E=5 MeV; calculated three-body $\sigma(\theta)$. ^{17}O level deduced S. Two-dimensional coupled integral equations, product integration method.
1980Kr18: ^{16}O(d,p), E=12 MeV; calculated $\sigma(\theta)$. Stripping to unbound states, resonant state theory, coupling constant analytic continuation.
1982Sh06: ^{16}O(d,p), E=400,660 MeV; calculated $\sigma(\theta)$. Eikonal model.
1982Th02: ^{16}O(d,p), E=10.49 MeV; calculated $\sigma(\theta)$. Coupled-channels method, Pauli, non-orthogonality effects.
1982Th06: ^{16}O(d,p), E=10.49 MeV; calculated channel nonorthogonality effects.
1983Ic01: ^{16}O(d,p), E=10.5 MeV; calculated $\sigma(\theta)$; deduced potential parameters. DWBA, bare potentials.
1983Sh15: ^{16}O(d,p), E=8 MeV; calculated $\sigma(\theta)$. DWBA, center-of-mass corrected shell model form factor.
1985JoZZ: ^{16}O(d,p), E=0.8-2 MeV; analyzed $\sigma(\theta)$.

^{16}O(d,p),(d,pγ) 1990Pi05,1957Br82 (continued)

1987Ro20: ^{16}O(d,p), E=25.2 MeV; calculated $\sigma(\theta)$; deduced model parameters. ^{17}O levels deduced spectroscopic factors. Deuteron breakup model.
1989Gu23: ^{16}O(d,p), E not given; calculated $\sigma(\theta)$; deduced reaction mechanism. Coupled-channels method, zero-range interactions.
1989Lu03: ^{16}O(d,p), E=10.5,24.89 MeV; calculated $\sigma(\theta)$. Bare potential DWBA.
1991Ma36: ^{16}O(d,p), E=13.5 MeV; calculated $\sigma(\theta)$. Three-body formalism, bound state approximation, unitarity.
1992MaZM: ^{16}O(d,p), E not given; calculated $\sigma(\theta)$. Three-body approach to transfer reactions.
1993Gu04: ^{16}O(pol. d,p), E=2.864-9.3 MeV; analyzed $\sigma(\theta)$, i$T_{11}(\theta)$. Coupled-channels method, stripping as multi-nucleon exchange.
1995Bu10: ^{16}O(d,p), E=6.26 MeV; calculated $\sigma(\theta)$. Three-body Faddeev calculations.
1996Gu23: ^{16}O(pol. d,p), E≤10 MeV; analyzed tensor polarization data; deduced multi-nucleon exchange role in stripping. Coupled-channels approach.
1996Ma36: ^{16}O(d,p), E=5.03,12 MeV; calculated $\sigma(\theta)$; deduced two-body interaction separability features. Transfer reactions, three-body theory, channel spins.
1999Le04: ^{16}O(d,p), E=8 MeV; analyzed $\sigma(\theta)$; deduced parameters. ^{17}O deduced radii, halo features.
1999Ti04: ^{16}O(d,p), E=36, 63.2 MeV; calculated $\sigma(\theta)$; deduced recoil excitation, breakup effects.
2004As11: ^{16}O(d,p), E=2.29-3.27 MeV; calculated σ(E,θ); deduced strong polarization effect. Coupled channels approach, comparisons with data.
2007AsZY: ^{16}O(d,p), E=2.279-3.186 MeV; calculated transfer reaction cross sections and spectroscopic factors using coupled reaction channel formalism.
2007AsZZ: ^{16}O(d,p), E=2.29-3.27 MeV; calculated spectroscopic factors and cross sections using coupled reaction channel method.
2007Gu18: ^{16}O(d,p), E not given; analyzed angular distributions to extract ANCs using DWBA and adiabatic wave approximation.
2007Pa10: ^{16}O(d,p), E=15 MeV; analyzed $\sigma(\theta)$; deduced spectroscopic factors, asymptotic normalization coefficients.
2009De02: ^{16}O(d,p), E=25.4,36.0,63.2 MeV; calculated $\sigma(\theta)$, binding energies. Momentum-space three-body Fadeev-like equations. Comparison with experimental data.
2009De07: ^{16}O(d,p), E=25.4,36 MeV; calculated differential cross sections, analyzing powers for polarized beam using local and nonlocal optical potentials parameters in the framework of Faddeev type scattering equations. Comparison with experimental data.
2010De41: ^{16}O(d,p), E=25.4,36.0 MeV; calculated $\sigma(\theta)$. Exact Faddeev/AGS equations with different NN potentials. Compared to data.
2013Ti04: ^{16}O(d,p), E=9-15 MeV; calculated $\sigma(\theta)$, Perey factor, local potential. Calculated β_n coefficients, moments and effective nonlocality range in A=16, 40, 208 mass range. Effect on spectroscopic factors and ANCs. ADWA theory with nonlocality of nucleon optical potential included in a consistent way together with the deuteron breakup. Deviation from E(d)/2 rule on theoretical cross sections.
2014Mu10: ^{16}O(d,p), E=36 MeV; calculated differential $\sigma(\theta)$, spectroscopic factors, neutron widths for deuteron stripping reactions to bound and resonant states. Distorted-wave Born approximation (DWBA), continuum-discretized coupled channels (CDCC), and surface-integral formalism.
2015De38: ^{16}O(d,p), E=7.7,11,12,13.3 MeV; calculated differential $\sigma(\theta)$. Faddeev-Alt-Grassberger-Sandhas (AGS) formalism with three-body model (proton+neutron+nuclear core) for proton-transfer reactions, and realistic Cd Bonn potential. Comparison with experimental data.
2016De31: ^{16}O(pol. d,p), E=36,63.2 MeV; calculated differential $\sigma(\theta)$ and Ay(θ) analyzing powers with a a number of angular-momentum and parity-dependent optical potentials, and using three-body Faddeev-type equations. Comparison with experimental data.
2016Ti02: ^{16}O(d,p), E=10,20,50 MeV; calculated $\sigma(\theta)$ using local and nonlocal potentials. Comparison of $\sigma(\theta)$ with distorted wave Born approximation (DWBA) and adiabatic distorted wave approximation (ADWA) calculations. Effect of nonlocality on (d, p) transfer cross sections and spectroscopic factors. Comparison of theoretical $\sigma(\theta)$ distributions with experimental data.
2017De20: ^{16}O(d,p), E=12 MeV; calculated $\sigma(\theta)$ using Faddeev-Yakubovsky or equivalent Alt-Grassberger-Sandhas integral equations in momentum space.
2018Li56: ^{16}O(d,p), E=10,20,50 MeV; calculated differential σ(E,θ), σ(E), relative contributions of the different neutron-target orbital angular momenta, neutron-target wave functions, and imaginary part of the potentials using both local and non-local potentials. R-matrix method to solve the nonlocal equations. Comparison with previous theoretical predictions. Relevance to surrogate method for (n,γ) reactions.
2019Sh35: ^{16}O(d,p), E=25, 36 MeV; calculated differential σ(E,θ), R-matrix method in DWBA.

^{16}O(d,p),(d,pγ) 1990Pi05,1957Br82 (continued)

2020Vi06: ^{16}O(d,p), E=3.4-25.9 MeV; calculated differential σ(E,θ), deduced spectroscopic factors.

^{17}O Levels

Note:
^{16}O(d,p) E_d=7.9 MeV (Bu51): Proc. Roy. Soc. A209, 478 (1951).
Angular distributions of the protons or the cross sections for the ^{16}O(d,p) reaction to many ^{17}O states have been studied for E_d=0.3-63.2, 698 MeV ((1959Ha29, 1961Ha19, 1961Ke01, 1962Ma25, 1963Al04, 1963Ya03, 1964Ki05, 1964Sc12, 1965Lo02, 1965Mo16, 1966Al09, 1966Ga09, 1966Sc09, 1967Al06, 1968Di06, 1968Ho23, 1968Na06, 1969Th04, 1970Da14, 1971Ko21, 1972Br12, 1972Co15, 1973Ca30, 1973Da17, 1974Co04, 1981Bo03, 1982Be64, 1985RoZV, 1990Pi05, 1993Qu04, 2002Ku35, 2003Ji11, 2004Gu23, 2016Ra06).
For energy levels observed see also (1955Kh35, 1956Gr37, 1961Ke02, 1963Ya03, 1964Sc12, 1970Da14, 1972Co15, 1973Da17, 1974Co04).
Others: (1973Jo10, 1990Ca32, 1992La08, 1992Ma47). See also (1961Ba10, 1991Pi09: ^{16}O(t,d_0)).

E(level)[†]	J^π[@]	$T_{1/2}$ or Γ[‡]	L[@]	S	Comments
0	5/2+		2	0.84 *4*	S: from (2019Ma31). See also $S_{average}$=0.81 (1970Da14), 0.925 (1972Co15), 0.95 (1974Co04) and S=0.94 *13* (2005Ts03: analysis). ANC=0.60 fm^{-1} *4* (2019Ma31), see also (2007Pa10: 0.67 fm^{-1} *5*).
870.749 *20*	1/2+	180.4 ps *20*	0	≈0.99[&]	E(level): From E_γ=870.725 *20* (1980Wa24). See also E_x(keV)=870.73 *10* (2015Pa05), 870 *20* (Bu51), 875 *12* (1954Sp01), 871 *4* (1957Br82). $T_{1/2}$: from τ_m=260.2 ps *29* which is the weighted average of (1960Ka10: 255 ps *13*), (1963Lo03: 263 ps *8*), (1964Be15: 258.7 ps *42*), (1965Mc10: 263 ps *7*), (1969Go04: 261 ps *7*). Other values(ps): 250 *100* (1953Th14), 233 *26* (1965Al14), 232 *8* (1967Bi05), 253 6 (1969Ni09: ^{9}Be(^{16}O,^{17}O)^{8}Be), 421 *21* (1962Ga15,1962Ga16), 258.7 (1971Do13).
3054.98 *20*	1/2−	<8 keV	1	0.032[a]	E(level): See also E_x(keV)=3070 *30* (Bu51), 3055 *12* (1954Sp01), 3055 *4* (1957Br82).
3842.76 *42*	7/2−	<8 keV	3	0.028[a]	E(level): See E_x(keV)=3870 *40* (Bu51), 3840 *12* (1954Sp01), 3846 *5* (1957Br82)/. S: See als <0.1 (1970Da14).
4553.8 *16*	3/2−	40 keV *5*	1	0.23	E(level): See also E_x(keV)=4590 *20* (Bu51), 4553 *5* (1957Br82). S: using HD parameters; 0.20: using mb parameters (1973Da17).
5084.4 *9*	3/2+	95 keV *5*	2	1.25	E(level): See also E_x(keV)=5060 *20* (Bu51), 5083 *10* (1957Br82). Γ: See also Γ(keV)=67 (1970Vi03), ≈70 (1974Co04: average value), Γ_n=97 keV *5* (1979An15). S: average value: using HD parameters (1973Da17).
5215.77 *45*		<8 keV			E(level): See also E_x=5215 keV *5* (1957Br82).
5379.2 *14*	3/2−	28 keV *7*			E(level): See also E_x(keV)=5310 *20* (Bu51), 5378 *7* (1957Br82)/.
5697.26 *33*	7/2−	<8 keV	3	≈0.15	E(level): See also E_x=5695 keV *5* (1957Br82). S: using HD parameters (1973Da17).
5732.79 *52*		<8 keV			E(level): See also E_x(keV)=5790 *20* (Bu51), 5731 *5* (1957Br82).
5869.07 *55*		<8 keV			E(level): See also E_x=5866 keV *5* (1957Br82).
5940[‡] *15*		23 keV *10*			
6260[#] *30*					
6850[#] *40*					
7530[#] *50*					

† From (1990Pi05: Q_0=1918.737 keV *62* was used) except where noted.
‡ From (1957Br82) except where noted. In (1957Br82) the resolution is ≈8 keV.

Continued on next page (footnotes at end of table)

^{16}O(d,p),(d,pγ) 1990Pi05,1957Br82 (continued)

^{17}O Levels (continued)

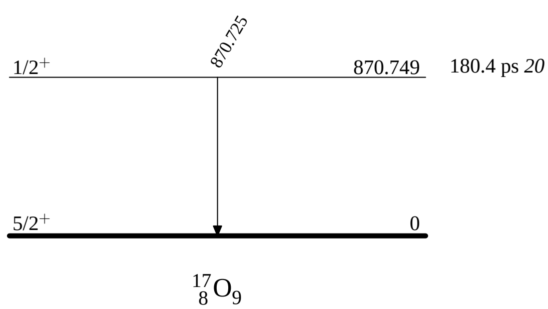
[#] From (Bu51).
[@] See (1956Gr37,1961Ke02,1963Ya03,1964Sc12).
[&] Average value from (1970Da14,1972Co15,1974Co04).
[a] Average value, calcualted using data from (1961Ke01,1964Sc12); see discussion in (1970Da14).

γ(^{17}O)

E_γ	E_i(level)	J^π_i	E_f	J^π_f	Comments
870.725 *20*	870.749	1/2$^+$	0	5/2$^+$	See E_γ(keV)=870.5 *20* (1952Th24: The internal conversion coefficient is consistent with E2), 869 *3* (1955Ma36), 870.81 *22* (1966Wi01), 870.7 (2000El08,2006Sz07), 870.725 *20* (1980Wa24). See also (1995Ro28,2016Cs02).

^{16}O(d,p),(d,pγ) 1990Pi05,1957Br82

Level Scheme



^{16}O(α,^{3}He),(α,n^{3}He) **1992Ya08**

1973PrZL: ^{16}O(α,^{3}He); measured σ(E(3He),θ). ^{17}O deduced levels.
1984YaZS: ^{16}O(α,^{3}He), E=64.9 MeV; measured $\sigma(\theta)$. ^{17}O levels deduced C^2S, $f_{7/2}$ strength fragmentation.
1992Ya08: ^{16}O(α,^{3}He), E=65 MeV; measured $\sigma(\theta)$. ^{17}O deduced levels, J, π, spectroscopic factors.
1993La31: ^{16}O(α,n^{3}He), E=120 MeV; measured neutron spectra. ^{16}O(α,n^{3}He), E=120 MeV; measured n(^{3}He)(θ). ^{17}O level deduced Γ_n/Γ. Neutron tof multi-detector.
See also (1997Mo06: theory).
1979Gr11: ^{16}O(α,^{3}He), E=75 MeV; calculated $\sigma(\theta)$. Channel coupling array theory.

^{17}O Levels

E(level)[†]	J$^\pi$[‡]	S[#]	Comments
0 *4*	5/2$^+$	1.3[@]	
0.87×10^3 *4*	1/2$^+$	0.90[@]	
3.05×10^3 *4*	1/2$^-$		
3.84×10^3 *4*	5/2$^-$		
5.08×10^3 *4*	3/2$^+$	0.67[&]	
5.22×10^3 *4*			
5.70×10^3 *4*	7/2$^-$	0.17[&]	$(\Gamma_n/\Gamma)_{exp}$=0.97 *5* (1993La31: ^{16}O(α,^{3}He)^{17}O*(5.697-MeV[7/2$^-$])→n+^{16}O$_{g.s.}$[0$^+$]).
5.87×10^3	3/2$^+$	0.06[&]	
6.97×10^3 *4*	3/2$^+$[†]	(0.08)[&]	
7.38×10^3 *4*			E(level): Unresolved from a contaminant peak due to the ^{13}C*(7.55 MeV:5/2$^-$) state.
7.58×10^3 *4*	7/2$^-$	0.01[&]	
7.69×10^3 *4*	7/2$^-$	0.10[&]	
7.75×10^3 *4*	11/2$^-$		
8.40×10^3 *4*	5/2$^+$	0.15[&]	
8.89×10^3 *4*			
9.49×10^3 *4*			
9.78×10^3 *4*	3/2$^+$	0.24[&]	

† From (1992Ya08).
‡ (1992Ya08) cited from Adopted Levels in (1986Aj04) except where noted.
# See also (1973Da17,1974Co04: ^{16}O(d,p)).
@ Obtained from EFR DWBA calculations (1992Ya08).
& Obtained from Zr DWBA calculations (1992Ya08).

^{16}O(^{7}Li,^{6}Li) 1973Sc26

1973Sc26: An E(^{7}Li)=36 MeV ion beam impinged on a $^{28}Si^{16}O_2$ target at the Heidelberg MP Tandem Van de Graaff accelerator. A scattering chamber including four movable ΔE-E detector telescopes, mounted at 15° intervals at a distance of ≈20 cm from the target was used. The particle was identified by multiplication units with outputs proportional to M=ΔE(e^{+}aΔE+bΔE^{2}). The ground state and five excited states of ^{17}O were observed and the optical model parameters using DWBA calculations were deduced.
1988Ke07: ^{16}O(^{7}Li,^{6}Li), E=34 MeV; measured $\sigma(\theta)$.

Theory:
1986Cl03: ^{16}O(^{7}Li,^{6}Li), E not given; calculated $\sigma(\theta)$; deduced reaction mechanism, model parameters. ^{17}O levels deduced one-nucleon transfer amplitudes. Microscopic DWBA, coupled-reaction channels analyses.

^{17}O Levels

E(level)†	J$^{\pi}$‡	Comments
0	5/2^{+}	The spectroscopic factor=1.2 for the ground-state transition (1988Ke07).
0.87×10^{3}	1/2^{+}	The spectroscopic factor=0.76 for the 0.87-MeV state transition (1988Ke07).
3.06×10^{3}		
3.85×10^{3}		
4.55×10^{3}		
5.38×10^{3}		

† Populated in (1973Sc26).
‡ From (1988Ke07).

^{16}O(^{13}C,^{12}C)

1975Se03: ^{16}O(^{13}C,^{12}C), E=3-16 MeV; measured σ(E). ^{17}O levels deduced S_1S_2.
1976We21: E=36 MeV; measured $\sigma(\theta)$. ^{17}O levels deduced S. See also (1976WeZE).
1977Du04: ^{16}O(^{13}C,^{12}C), E<Coulomb barrier; measured σ. ^{17}O deduced effective charges, radial integrals.
1979Bo36: ^{16}O(^{13}C,^{12}C), E=24 MeV; measured $\sigma(\theta)$. ^{17}O levels deduced L, S. Enriched targets. Coupled-channel analysis.
1979Ra10: ^{16}O(^{13}C,^{12}C), E=105 MeV; measured $\sigma(\theta)$. ^{17}O levels deduced S, parity.
1980Si12: ^{13}C(^{16}O,^{17}O), E=30-60 MeV; calculated $\sigma(\theta)$. Coupled channel treatment, channel nonorthogonality.
1983Os08: ^{16}O(^{13}C,^{12}C), E=36 MeV; analyzed $\sigma(\theta)$; deduced model parameters. ^{17}O levels deduced spectroscopic factors.
1985Be37: ^{13}C(^{16}O,X), E=20-70 MeV; measured γ-ray yields of reaction products; deduced resonant behavior, Landau-Zener effect. Hauser-Feshbach analysis.
1986Pa10: ^{13}C(^{16}O,^{12}C), E(cm)=7.8-14.6 MeV; measured E_γ, I_γ, residual production σ(E); deduced fusion σ(E). Statistical model analysis. Ge(Li) detector, enriched target.
2000Ik01: ^{16}O(^{13}C,^{12}C), E=50 MeV; measured particle spectra, $\sigma(\theta)$.

^{17}O Levels

E(level)†	J$^\pi$†	L‡	S_1S_2#	Comments
0	5/2$^+$	3	0.60	S_1S_2: $1p_{1/2}\rightarrow1d_{5/2}$ neutron transfer configuration (1979Bo36: LOLA). See also (1979Bo36: S_1S_2=0.49 (Iγ normalization(CRC)). See also (2000Ik01: S=0.900 (DWBA), 0.900 (α)).
871	1/2$^+$	1	0.72	E(level): Well described as the coupling of a $2s_{1/2}$ neutron to the ^{16}O core (1968Na06). L: See also (1976We21,1983Os08). S_1S_2: $1p_{1/2}\rightarrow2s_{1/2}$ neutron transfer configuration; extracted using a Coulomb wave Born approximation (1975Se03); and compared with the theoretical value 0.61 (1968Na06: using S_1=0.61 for the $^{13}C_{g.s.}$). See also (1979Bo36: S_1S_2=0.50 (LOLA), 0.51 (Iγ normalization(CRC)). See also (1983Os08: S=0.6138), (2000Ik01: S=0.800 (DWBA), 0.750 (α)). C^2S=0.49; Q(β^-)value=−0.804 MeV (1976We21).

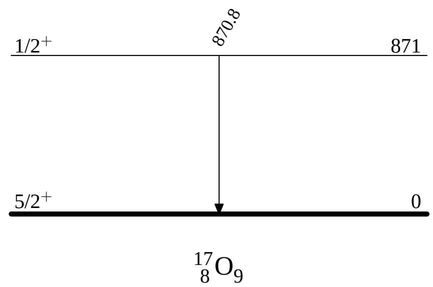
† From Adopted Levels. Also observed in (1979Ra10,2000Ik01). See also (2000Ik01) for higher excited states observed.
‡ L transfer from (1979Bo36).
# Products of the neutron spectroscopic factors in the initial and final states.

γ(^{17}O)

E_γ	E_i(level)	J^π_i	E_f	J^π_f	Comments
870.8	871	1/2$^+$	0	5/2$^+$	E_γ: From (1985Be37). See also (1977Du04,1976We21).

^{16}O(^{13}C,^{12}C)

Level Scheme



^{16}O(^{14}N,^{13}N) 1975Na15

1975Na15: ^{16}O(^{14}N,^{13}N), E=155 MeV; measured $\sigma(\theta)$. ^{17}O levels deduced S. Transitions were identified to the 5/2$^+$ ground state and the 3/2$^+$ 5.08-MeV state. In addition, there were peaks observed at E_x=7.5, 11.2, and 14.7 MeV. The first excited state at 0.871 MeV (1/2$^+$) was weakly excited and could not be clearly distinguished above the tail of the ground state peak. In the analog channel ^{16}O(^{14}N,^{13}C)^{17}F the ground state (5/2$^+$) and the 5.10 MeV (3/2$^+$) were identified together with several peaks at higher excitation energies as in the neutron stripping spectrum.

1976Mo03: ^{16}O(^{14}N,^{13}N), E=79 MeV; measured $\sigma(\theta)$. ^{17}O levels deduced S. The angular distribution for the transition to the $2s_{1/2}$ state in ^{17}O showed an anomaly similar to that already reported in studies of ^{12}C(^{14}N,^{13}N) and ^{12}C(^{10}B,^{9}Be).

1976Ku06: ^{16}O(^{14}N,^{13}N), E=79 MeV; analyzed anomalous $\sigma(\theta)$.

1976Na09: ^{16}O(^{14}N,^{13}N), E=155 MeV; calculated $\sigma(\theta)$.

^{17}O Levels

E(level)†	J^{π}†	Comments
0	5/2$^+$	
871	1/2$^+$	E(level): Weakly excited; poorly resolved above the tail of the ground-state peak.
5080	3/2$^+$	
7500		
11200		
14700		

† Reported in (1975Na15).

^{16}O(^{18}O,^{17}O) 2018Li59

1975Re15: ^{16}O(^{18}O,^{17}O), E=42,52 MeV; measured σ(E(^{17}O),θ); deduced reaction mechanism.
2018Li59: XUNDL dataset compiled by TUNL, 2019.
An 84 MeV beam of ^{18}O ions, from the INFN-Catania tandem, impinged on a 210 μg/cm^2 WO_3 foil that was placed at the MAGNEX target position. The ^{17}O reaction products were momentum analyzed in the MAGNEX spectrometer and identified in the focal plane. Differential cross sections are reported for ^{17}O*(0, 0.87, 3.15, 5.20 MeV) for $\theta_{c.m.}\approx7°$ to 24°.
Spectroscopic amplitudes were deduced via shell model analysis of (^{18}O,^{17}O) reaction data on ^{28}Si and ^{64}Ni targets using the NUSHELLX code.
See also (1977Pe08).

^{17}O Levels

E(level)	J$^\pi$	Comments
0†	5/2$^+$	
0.87×10^3†	1/2$^+$	E(level): The single excitation and mutual ^{16}O(^{18}O,^{17}O*(870))^{17}O*(870) reactions are observed.
3.15×10^3	1/2$^-$	
5.20×10^3	3/2$^+$	

† Also populated in (1975Re15).

$^{17}O(\gamma,\gamma')$ 1994Mo18

1994Mo18: $^{17}O(\gamma,\gamma')$, E=4.7 MeV bremsstrahlung; measured scattering σ. ^{17}O level deduced Γ. Enriched target.
See also (2001Ka06,2001Sa52,2004Is09: theory).

^{17}O Levels

E(level)†	J^{π}†	Γ†
3841	5/2⁻	92×10^{-3} eV *6*

† From (1994Mo18).

^{17}O(γ,n),^{17}O(γ,p) 1979Jo05

S(n)=4143.1 keV, S(p)=13781.6 keV. (2021Hu06).

1978Ho16: ^{17}O(γ,n), E=4.3-7 MeV; measured σ(E,θ). ^{17}O resonances deduced ground state γ_γ for E1, M1. R-matrix analysis, astrophysical implications.

1979Jo05: ^{17}O(γ,n_0), E=13.7,16,22,28,34 MeV bremsstrahlung; measured σ(E,θ). ^{17}O deduced resonances, J, π, Γ_γ, GDR (T=1/2) strength.

1980Ju01: ^{17}O(γ,n),(γ,2n), E=8.5-39.7 MeV; measured σ(total). ^{17}O deduced GDR isospin splitting. 4π neutron detector.

1985Ju02: ^{17}O(γ,n), E=10-24 MeV; measured σ(θ). ^{17}O deduced resonances, J, π, Legendre polynomial expansion coefficients a_1, a_2.

1989Or07: ^{17}O(γ,n),(γ,p), E=28 MeV bremsstrahlung; measured bremsstrahlung weighted σ; deduced reaction mechanism. Isotopically enriched sample, deexcitation γ-rays detection.

1992Zu01: ^{17}O(γ,p),(γ,X), E=13.5-43.15 MeV; measured reaction yields; deduced σ(γ,p), σ. ^{17}O deduced resonances, J, π, Γ, GDR.

1953Ho81: ^{17}O(γ,n); analyzed nuclear reaction synthesis in stars; deduced isotope yields. Breit-Wigner formalism.

1977Al18: ^{17}O(γ,X); calculated σ. ^{17}O calculated resonances, T. Two-particle, one-hole shell model.

1990Mc06: ^{17}O(γ,n); analyzed data. ^{17}O deduced levels, T.

1993Mc02: ^{17}O(γ,n),(γ,2n),(γ,p), E<36 MeV; analyzed σ(E); deduced isospin component splitting.

2004El05: Theory, analysis of isotopic effect in GDR wdith.

See also (2001Ka06,2001Sa52,2004Is09: theory).

^{17}O Levels

E(level)†	J$^\pi$	$\Gamma_{\gamma 0}$ (eV)†	Comments
4549#	3/2$^-$#	0.42#	E1 transition (1978Ho16).
5077#	3/2$^+$#	1.0#	E(level): see also (1979Jo05: 5140 keV). M1 transition (1978Ho16).
5270?‡			
5430	3/2$^-$#	0.7 *4*	E(level): See also (1978Ho16: 5378 keV). $\Gamma_{\gamma 0}$ (eV): See also $\Gamma_{\gamma 0}$=0.06 eV (1978Ho16). E1 transition (1978Ho16).
5570?‡			
5710	7/2$^-$#	1.1 *4*	E(level): See also (1978Ho16: 5690 keV). $\Gamma_{\gamma 0}$ (eV): See also $\Gamma_{\gamma 0}$=0.4 eV (1978Ho16). E1 transition (1978Ho16).
5729#	(3/2,5/2,7/2)#		E1, M1 transition (1978Ho16).
5960?			
6300?‡	1/2$^+$#	<0.07#	E(level): See also (1978Ho16: 6354 keV). E2 transition (1978Ho16).
6610			
6970			
7210?			
7370		0.8 *4*	
7660		1.5 *5*	
7800?‡			
7910?‡			
8240		1.4 *5*	
8480		6.6 *18*	
8690?‡		1.2 *6*	
8800?‡			
8900&		4.1 *8*	
9130?			
9280			

Continued on next page (footnotes at end of table)

^{17}O(γ,n),^{17}O(γ,p) 1979Jo05 (continued)

^{17}O Levels (continued)

E(level)[†]	J^{π}	Γ	Comments
9550?[‡]			
9720			
10250?[‡]			
10530	5/2⁻[@]		E(level): See also (1985Ju02: 10500 keV). a_2=+0.35±0.15 (1985Ju02).
11020?[‡]			
11300[&]			
11750[&]			
12300[&]			
12660[&]			
12870[&]			
13100[&]	3/2⁻[@]		E(level): See also (1985Ju02: 13000 keV). a_2=0.0±0.10 (1985Ju02).
13470[&]			
14.1×10^3? *1*	3/2⁻[@]		E(level): From (1992Zu01: weak resonance at E_γ=14.1 MeV *1*). T=3/2 (1992Zu01). See also 14.0 MeV (1985Ju02). a_2=0.0±0.10 (1985Ju02).
14380[&]			T=1/2 (1990Mc06).
15.06×10^3 *5*			E(level): from E_γ(res)=15.06 MeV *5* with Γ≈0.45 MeV; a few narrow T=3/2 states and M1 transitions contribute to the measured strength (1992Zu01).
15240[&]			T=1/2 (1990Mc06).
15600[&]			T=1/2 (1990Mc06).
16600[@&]	7/2⁻[@]		a_2=−0.35±0.13 (1985Ju02).
17200[&]			
17780[&]			
18.09×10^3 *7*		0.59 MeV *14*	E(level),Γ: from E_γ(res)=18.09 MeV *7*; probably a doublet consisting of (18.101-MeV[J^π=3/2⁻; T=3/2] (1981Hi01) and very weakly excited state at 18.3-MeV[T=1/2]) (1992Zu01).
18500[&]			
19.28×10^3 *7*		0.75 MeV *10*	E(level),Γ: From 19.3-MeV[T=1/2] from E_γ(res)=19.28 MeV *7* (1992Zu01); see also 19.1 MeV (1990Mc06).
20.33×10^3 *7*	(7/2⁻)	0.30 MeV *10*	E(level),Γ: from E_γ(res)=20.33 MeV *7* (1992Zu01). J^π: (1992Zu01).
20500[&]			
21000[@&]	7/2⁻[@]		a_2=−0.50±0.10 (1985Ju02).
22.17×10^3 *10*		≈1 MeV	E(level),Γ: from E_γ(res)=22.17 MeV *10* (1992Zu01).
23.1×10^3 *1*			E(level): from E_γ(res)=23.1 MeV *1* (1992Zu01). E(level): A giant dipole resonance, 6 MeV broad, is centered at 23 MeV (1980Ju01).
24.4×10^3 *1*			E(level): From E_γ(res)=24.4 MeV *1* (1992Zu01), see also 24.7 MeV in (1990Mc06).
25600[&a]			
26.50×10^3? *15*			E(level): E_γ(res)=26.50 MeV *15* (1992Zu01).

[†] From (1979Jo05) except where noted. A systematic problem with the calibration of (1979Jo05) is discussed in (1990Mc06). Level values above 10 MeV from these references are not considered in the evaluation.
[‡] Evidence for a resonance is not compelling (1979Jo05).
[#] From (1978Ho16).
[@] From (1985Ju02). J^π: likely assignment.

Continued on next page (footnotes at end of table)

$^{17}O(\gamma,n),^{17}O(\gamma,p)$ 1979Jo05 (continued)

^{17}O Levels (continued)

[&] From (1990Mc06), who reanalyzed the data of (1979Jo05).
[a] A broad structure of T=1/2 nature with 28<E_x<36 MeV is also reported (1980Ju01).

^{17}O(e,e′) 1977No06,1986Ma48

1970Si02: The elastic-scattering cross sections for ^{17}O were measured at E_e=94-121 MeV with electron scattering angles θ=45°−140° at the Saskatchewan Accelerator Laboratory with a gas target system. RMS charge radius ratio of ^{17}O and ^{16}O, R_{17}/R_{16}=0.995 *6* in both $\beta\alpha$ (Born approximation) and DWA (distorted wave approcimation) calculations where $R_{16}(\beta\alpha)$=2.712 fm *22* and R_{16}(DWA)=2.674 fm *22*.

1975Ki15: Electron beams at E=84-122 MeV bombarded a 96% ^{17}O enriched gas target at the Saskatchewan Accelerator Laboratory with scattering angles θ=80°−145°. The range of momentum transfer was θ=0.6-1.1 fm^{-1} with the energy resolution, Δp/p≈0.2%. Coulomb form factors were measured and the B(E3) values for 12 odd-parity ^{17}O levels were deduced.

1977No06: An E=64.9, 83.3, 101.3, 113.6, 124.0 and 168.4 MeV electron beam impinged on the 96% enriched (^{16}O contaminant) ^{17}O gas target (≈11 atm pressure at room temperature) at the Saskatchewan Accelerator Laboratory. The scattered electrons were detected using a 45-channel array situated in the focal plane of a 127° double-focusing magnetic spectrmeter. A broad dipole resonance centered at E_x=22-23 MeV with strength extending down to 10-12 MeV was observed. A smaller resonance, with a form factor consistent with a C2 transition, was found between E_x=17.5 and 19.6 MeV.

1978Ki01: Cross sections were measured for electron elastic and inelastic scattering from ^{17}O for momentum transfer up to 1.2 fm^{-1} at the Saskatchewan electron scattering facility. E=62.5-125 MeV electron beams impinged on a 96% ^{17}O enriched gas target (≈10 atm pressure) with the scattering angles θ=79°−145°. Overall momentum resolution was ≈0.2%. The^{17}O charge radius was reported to be $\langle r^2\rangle_{1/2}$=2.710 fm *15* based on $\langle r^2_{17}\rangle^{1/2}/\langle r^2_{16}\rangle^{1/2}$=1.0015 *25*. Form factors for ^{17}O states E_x<9 MeV were also presented along with ground state transition strengths.

1979Hy01: Scattered-electron spectra were measured at θ=90°, 160° and 180° using three targets, 20-40 Mg/cm^2, 20-85% enriched BeO foils at the MIT-Bates Linear Accelerator. The transverse form factor of the $^{17}O_{g.s.}$ in the effective momentum-transfer range $0.55\leq q_\varepsilon\leq 2.8$ fm $^{-1}$ was determined. Considerable deviation from the single-particle prediction was found; in particular, a sizable suppression of the M3 multipole and an enhancement of the high-q side of the M5 multipole.

See also (1983Bu08).

1979Mi09: The charge form-factors of ^{17,18}O were measured at E_e=70-370 MeV and at θ=90° using 20-48 mg/cm^2 BeO foil targets (67% ^{18}O, 19% ^{17}O, 14% ^{16}O) at the MIT/Bates Linear Accelerator Laboratory. The range in momentum transfer was q=0.5-2.6 fm^{-1}. The charge-distribution differences between ^{17,18}O and ^{16}O were extracted and $\langle r^2_{17}\rangle^{1/2}$-$\langle r^2_{16}\rangle^{1/2}$=−0.008 fm *7* where $\langle r^2_{16}\rangle^{1/2}$=2.720 fm was reported.

1983Ra27: Six ^{17}O excited states at E_x=11-15.3 MeV (T=3/2) were populated in a high-resolution electron scattering experiment at Darmstadt. Electron beams of E_e=39-59 MeV bombarded a ^{17}O gas target filled to 7 bar (6.0% ^{16}O, 89.6% ^{17}O and 4.4% ^{18}O) with thickness of 3.5-8.0 mg/cm^2; measurements covered the momentum transfer q=0.32-0.52 fm^{-1}. Five transitions at E_x=11.08, 12.47, 12.99, 14.23 and 14.75 MeV:9/2$^-$ are dominantly M2 with transition strengths B(M2,k)↑=6.1 19, 6 *3*, 6 *3*, 46 *7* and 27 *9* $\mu_N^2\cdot$fm^2, respectively. The transition to ^{17}O*(15.10 MeV:(3/2)$^+$) is M1 with B(M1,k)↑=0.14 *4* μ_N^2.

1986Ma48: Inelastic scattering was studied at E_e=194.3, 209.2, 248.4, and 268.8 MeV (at θ=90′) (1.4, 1.5, 1.7 and 1.9 fm^{-1} momentum transfer) with the bombardment of a 29.1 mg/cm^2 enriched BeO foil at the MIT-Bates high-resolution energy-loss spectrometer facility. The energy resolution ranged from 20 to 30 keV. Measurements were also made at E_e=179.5 MeV (at θ=159.8°), which corresponds to a 1.7 fm^{-1} momentum transfer, with a poorer energy resolution of ≈70 keV. The form factors for ^{17}O*(15.78,17.06,20.14,20.70 MeV) were measured. See also (1987Mi25: comment) and (1987Ma40: reply).

1987Ma52: Electron-scattering measurements for ^{17}O were performed at the MIT-Bates Linear Accelerator Center with E_e≈100-269 MeV. Enriched BeO foils target were used (85% ^{17}O, 11% ^{16}O and 4% ^{18}O) with average thickness 29.1 mg/cm^2 and 28.7 mg/cm^2 for measurements of scattered electrons spectra at θ=90°, 160° and θ=140°, respectively. The energy resolution FWHM for the measurements ranged from 20-50 keV at 90°, from 30-60 keV at 140°, and from 70-80 keV at 160°.

Excited states of ^{17}O up to 15 MeV have been observed. A new narrow state, E_x=12.22 MeV *2* (Γ≤20 keV) was observed and the states E_x=8.90 MeV *2* and 14.72 MeV *2* were confirmed. Levels at E_x=5.87 MeV(3/2$^+$). 6.86 MeV(5/2$^+$), 7.58 MeV(7/2$^+$), and 8.47 MeV(9/2$^+$) were suggested as a predominabtly 5p-4h members (K^π=3/2$^+$) rotational band.

1988Ka08: The experiment was performed at the Bates Linear Accelerator Center/MIT with the high-resolution energy-loss spectrometer system (ELSSY) using 50-110 mg/cm^2 BeO targets (51.3% ^{17}O, 31.6% ^{18}O and 17.1% ^{16}O). The elastic magnetic form factor of ^{17}O was measured for effective momentum transfer $2.47\leq q_{eff}\leq 3.65$ fm^{-1}.

See also theoretical discussion on M4 transitions in (1987Mi25) and (1976AuZZ, 1978Ar04, 1980Bo04, 1982RaZX, 1985MaZX, 1986KaZZ, 1986MaZW, 1988Fu04,1988Ic01, 2007Do20, 2018Gu11, 2019Sa21: theory).

^{17}O(e,e′) 1977No06,1986Ma48 (continued)

Theory:
1982Co03: ^{17}O(e,e), E not given; calculated magnetic form factor; deduced three-body force, two-pion exchange effects.
1982Hi01: ^{17}O(e,e), E not given; calculated magnetic form factor; deduced $d_{5/2}$ neutron orbit radius, M3, M5 multipole quenching.
1982Mc01: ^{17}O(e,e), E not given; calculated magnetic form factor. Self-consistent method, effective operator, higher order terms.
1984Bl03: ^{17}O(e,e′), E not given; calculated magnetic form factor; deduced meson exchange, isobar, core polarization effects relative magnitude.
1984BlZW: ^{17}O(e,e), E not given; calculated form factors. Spin-isospin transitions, nucleon-hole, isobar-hole excitation, meson exchange.
1985KiZY: ^{17}O(e,e′), E not given; calculated charge, magnetic form factors.
1986Ki10: ^{17}O(e,e), E not given; calculated charge, magnetic form factor. Relativistic treatment.
1987Fu06: ^{17}O(e,e), E=175-500 MeV; calculated transverse form factors. Relativistic mean field theory.
1989Fu05: ^{17}O(e,e), E not given; calculated magnetic form factor. Relativistic Hartree approach.
1989Ga04: ^{17}O(e,e), E not given; calculated magnetic form factor.
1991Co12: ^{17}O(e,e), E not given; calculated magnetic form factor; deduced valence neutron radial wave function model dependence.
1992Go07: ^{17}O(e,e), E not given; calculated magnetic form factors; deduced core polarization role. Harmonic oscillator shell model, perturbation theory, Sussex interaction matrix elements.
1992Su02: ^{17}O(e,e), E not given; calculated magnetic form factors, Coulomb energy differences. Hartree-Fock, Wood-Saxon wave functions.
1992Zh07: ^{17}O(e,e), E not given; calculated magnetic form factor. Particle-hole, multi-particle multi-hole configurations mixing.
1994Am01: ^{17}O(pol. e,e), E not given; calculated magnetic and Coulomb form factors, response functions. Meson exchange effects, polarized target.
1994Mo19: ^{17}O(pol. e,e′), E not given; calculated response functions. Shell model wave functions, meson exchange effects, different target polarizations.
1995Pl02: ^{17}O(e,e), E not given; analyzed magnetic form factor data; deduced spin-isospin channel effective interaction suppression, Landau-Migdal constant momentum transfer dependence. Finite Fermi systems theory.
1996Ka52: ^{17}O(e,e), E not given; calculated transverse form factor. Coherent density fluctuation model based natural orbitals.
2003Ra09: ^{17}O(e,e′), E not given; calculated longitudinal Coulomb form factors, transition probabilities, core polarization effects, quadrupole moments. Modified surface delta interaction, comparison with data.
2003Ra30: ^{17}O(e,e), E not given; calculated electron scattering form factors, core polarization effects. Configuration mixing shell model.
2015Wa19: ^{17}O(e,e), q<4 fm^{-1}; calculated magnetic form factors in relativistic frame with single-nucleon wave functions generated using the relativistic mean field model. Comparison with experimental data.
2018Al08: ^{17}O(e,e),(e,e′), momentum transfer=0.0-3.0 fm^{-1}; calculated longitudinal and transverse form factors for several levels in ^{17}O. Shell model and Hartree-Fock mean field calculations with SLy4 and SkXcsb Skyrme interaction, Ho, and WS potentials. Comparison with experimental data. ^{17}O; calculated levels, J, π, rms radii using different single particle potentials, B(E2), B(E3) in the psdpn and zbme shell-model spaces.
2021He03: ^{17}O(e,e), E at momentum transfer θ<4 fm_1; calculated magnetic form factors for backwards elastic scattering.

For (1975Ki15, 1978Ki01, 1987Ma52), E_x are from (1971Aj02). J are from (1982Aj01) except where noted.

^{17}O Levels

E(level)	J$^{\pi}$[b]	Γ	Comments
0.87×10^{3}[#a]	1/2^{+}		See B(E2)↑=2.18 e^{2}fm^4 *16* (1987Ma52), and B(C2)↑=2.10 e^{2}fm^4 *1* (1978Ki01): deduced from the lifetime measurement of (1971Aj02).
3.06×10^{3}[†#a]	1/2^{-}	<10 keV	Γ: (1987Ma52). See B(E3)↑=14.1 e^{2}fm^6 *39* (1987Ma52), B(E3)↑=31 e^{2}fm^6 *6* (1975Ki15), and B(C3)↑=31 e^{2}fm^6 *6* (1978Ki01).
3.84×10^{3}[†#a]	5/2^{-}	<10 keV	Γ: (1987Ma52).

Continued on next page (footnotes at end of table)

^{17}O(e,e′) 1977No06,1986Ma48 (continued)

^{17}O Levels (continued)

E(level)	J^{π}[b]	Γ	Comments
			See B(M2)↑=5×10^{-2} e^{2}fm^4 *2* (1978Ki01); B(E3)↑=93.0 e^{2}fm^6 *83* (1987Ma52), B(E3)↑=153 e^{2}fm^6 *6* (1975Ki15), and B(C3)↑=153 e^{2}fm^6 *6* (1978Ki01).
4.55×10^3[†#a]	3/2$^-$		See B(M2)↑=5.4×10^{-2} e^{2}fm^4 *21* (1978Ki01); B(E3)↑=20 e^{2}fm^6 12 (1987Ma52), B(E3)↑=98 e^{2}fm^6 *8* (1975Ki15), and B(C3)↑=98 e^{2}fm^6 *8* (1978Ki01).
5.08×10^3[#a]	3/2$^+$		See B(E2)↑=2.05 e^{2}fm^4 *20* (1987Ma52), and B(C2)↑=2.5 e^{2}fm^4 *7* (1978Ki01).
5.22×10^3[†#a]	9/2$^-$	<10 keV	Γ: (1987Ma52). J^{π}: From (1987Ma52). See B(M2)↑<4×10^{-2} e^{2}fm^4 (1978Ki01); B(E3)↑=319 e^{2}fm^6 *13* 1987Ma52), B(E3)↑=360 e^{2}fm^6 *11* (1975Ki15), and B(C3)↑=360 e^{2}fm^6 *11* (1978Ki01).
5.38×10^3[†#a]	3/2$^-$		See B(M2)↑=6×10^{-2} e^{2}fm^4 *3* (1978Ki01); B(E3)↑=47.9 e^{2}fm^6 *43* (1987Ma52), B(E3)↑=45 e^{2}fm^6 *12* (1975Ki15), and B(C3)↑=45 e^{2}fm^6 *12* (1978Ki01).
5.70×10^3[†#a]	7/2$^-$	<10 keV	Γ: (1987Ma52). See B(M2)↑=0.3 e^{2}fm^4 *2* (1978Ki01); B(E3)↑=97.0 e^{2}fm^6 *65* (1987Ma52), B(E3)↑=270 e^{2}fm^6 *32* (1975Ki15), and B(C3)↑=270 e^{2}fm^6 *32* (1978Ki01).
5.73×10^3[a]	(5/2$^-$)	<10 keV	J^{π},Γ: (1987Ma52). See B(E3)↑=134 e^{2}fm^6 *21* (1987Ma52).
5.87×10^3[a]	3/2$^+$	<10 keV	Γ: (1987Ma52). See B(E2)↑=2.13 e^{2}fm^4 *22* (1987Ma52).
5.94×10^3[†#a]	1/2$^-$		See B(E3)↑=25.3 e^{2}fm^6 *51* (1987Ma52), B(E3)↑=17 e^{2}fm^6 *10* (1975Ki15), and B(C3)↑=17 e^{2}fm^6 *10* (1978Ki01).
6.36×10^3[#a]	1/2$^+$		See B(E2)↑=1.43 e^{2}fm^4 *21* (1987Ma52), and B(C2)↑=2.1 e^{2}fm^4 *13* (1978Ki01).
6859[†#a]	5/2$^+$	<10 keV	Γ: (1987Ma52). Unresolved with 6970 (1978Ki01). J^{π}: From (1987Ma52). See B(E2)↑=0.83 e^{2}fm^4 *25* and J^{π}=5/2$^+$ (1987Ma52). Earlier analysis, based in J^{π}=(1/2$^-$) found B(E3)↑=(147 e^{2}fm^6 *34*) (1975Ki15), and B(C3)↑=147 e^{2}fm^6 *34* (1978Ki01).
6970[#a]	(7/2$^-$)	<10 keV	J^{π},Γ: (1987Ma52). Unresolved with 6859 (1978Ki01). See B(E3)↑=75.5 e^{2}fm^6 *56* and J^{π}=(7/2$^-$) (1987Ma52). Earlier analysis based in J^{π}=(5/2$^+$) from (1978Ki01) found B(C2)↑=1.9 e^{2}fm^4 *10* (1978Ki01).
7.17×10^3[†a]	5/2$^-$	<10 keV	Γ: (1987Ma52). See B(E3)↑=11.1 e^{2}fm^6 *29* (1987Ma52), and B(E3)↑=22 e^{2}fm^6 *25* (1975Ki15).
7.20×10^3[a]	3/2$^+$		See B(E2)↑=1.79 e^{2}fm^4 *25* (1987Ma52).
7378[#a]	5/2$^+$	<10 keV	Γ: (1987Ma52). Unresolved with 7379 (1978Ki01,1987Ma52). See B(E2)↑<0.8 e^{2}fm^4 (1987Ma52), B(C2)↑=3.6 e^{2}fm^4 *10* (1987Ki01), and B(C0)↑=5.5 e^2 *10* (1987Ki01).
7379[†#a]	5/2$^-$	<10 keV	Γ: (1987Ma52). Unresolved with 7378 (1978Ki01,1987Ma52). See B(E3)↑=36.9 e^{2}fm^6 *24* (1987Ma52), B(E3)↑=47 e^{2}fm^6 *38* (1975Ki15), and B(C3)↑=47 e^{2}fm^6 *38* (1978Ki01).
7.56×10^3[a]	3/2$^-$		See B(E3)↑<15 e^{2}fm^6 (1987Ma52).
7.57×10^3[†#a]	7/2$^+$	<10 keV	J^{π},Γ: (1987Ma52). See B(E2)↑=4.20 e^{2}fm^4 *51* and J^{π}=7/2$^+$ (1987Ma52), Earlier analysis using J^{π}=7/2$^-$ found Eβ(C1)↑=7.8×10^{-2} e^{2}fm^2 *20* (1978Ki01), B(E3)↑=109 e^{2}fm^6 *26* (1975Ki15), and B(C3)↑=109 e^{2}fm^6 *26* (1978Ki01).
7.69×10^3[a]	7/2$^-$		See B(E3)↑=33.9 e^{2}fm^6 *49* (1987Ma52).
7.76×10^3[†#a]	(11/2$^-$)	<10 keV	Γ: (1987Ma52). See B(E3)↑=287 e^2 fm^6 *14* and J^{π}=11/2$^-$ (1987Ma52), B(E3)↑=369 e^{2}fm^6 *15* (1975Ki15), and B(C3)↑=369 e^{2}fm^6 *15* (1978Ki01).
7.96×10^3[a]	1/2$^+$		See B(E2)↑=2.00 e^{2}fm^4 *38* (1987Ma52).

Continued on next page (footnotes at end of table)

^{17}O(e,e′) 1977No06,1986Ma48 (continued)

^{17}O Levels (continued)

E(level)	J$^{\pi}$[b]	Γ	Comments
8.20×10^3[a]	3/2$^-$		See B(E3)↑=11.0 e^{2}fm^6 *13* (1987Ma52).
8347[#a]	1/2$^+$		Unresolved with 8402, 8467, 8502 (1978Ki01). See B(E2)↑=0.48 e^{2}fm^4 *7* (1987Ma52), B(C0)↑=7.6 e^2 *14* (1978Ki01), and B(C2)↑=8.3 e^{2}fm^4 *26* (1978Ki01).
8402[#a]	5/2$^+$	<10 keV	Γ: (1987Ma52). Unresolved with 8347, 8467, 8502 (1978Ki01). See B(E2)↑=2.10 e^{2}fm^4 *34* (1987Ma52), B(C0)↑=7.6 e^2 *14* (1978Ki01), and B(C2)↑=8.3 e^{2}fm^4 *26* (1978Ki01).
8467[#a]	9/2$^+$	<10 keV	J$^{\pi}$,Γ: (1987Ma52). Unresolved with 8347, 8402, 8502 (1978Ki01). See B(E2)↑=10.1 e^{2}fm^4 12 and J$^{\pi}$=9/2$^+$ (1987Ma52). Earlier analysis using J$^{\pi}$=7/2$^+$ found B(C0)↑=7.6 e^2 *14* (1978Ki01), and B(C2)↑=8.3 e^{2}fm^4 *26* (1978Ki01).
8502[†#a]	5/2$^-$	<10 keV	Γ: (1987Ma52). B(E3)↑ negligible (1975Ki15). Unresolved with 8347, 8402, 8467 (1978Ki01). See B(E3)↑<7 e^2 fm^6 (1987Ma52), B(C0)↑=7.6 e^2 *14* (1978Ki01), and B(C2)↑=8.3 e^{2}fm^4 *26* (1978Ki01).
8.69×10^3[a]	3/2$^-$		See B(E3)↑=5.2 e^{2}fm^6 *12* (1987Ma52).
8.90×10^3[a] *2*	(9/2$^-$)	≤20 keV	E(level),J$^{\pi}$,Γ: (1987Ma52). E(level): Probably is the level reported in (1965Ba32: 8.884-MeV; Γ=8 keV). See B(E3)↑=13.3 e^{2}fm^6 *23* (1987Ma52).
8.97×10^3[a]	7/2$^-$		See B(E3)↑=36.3 e^{2}fm^6 *41* (1987Ma52).
9.15×10^3[a]	(1/2$^-$,9/2$^-$)	<10 keV	Γ: (1987Ma52). 1987Ma52: Unresolve doublet. See B(E3)<2.3 e^{2}fm^6 (1987Ma52).
9.18×10^3[a]	7/2$^-$	<10 keV	Γ: (1987Ma52). Unresolved with 9190 (1987Ma52). See B(E3)↑=2.4 e^{2}fm^6 *10* (1987Ma52).
9.19×10^3[a]	5/2$^+$	<10 keV	Γ: (1987Ma52). Unresolved with 9180 (1987Ma52). See B(E2)↑=0.48 e^{2}fm^4 *16* (1987Ma52).
9.42×10^3[a]	3/2$^-$		See B(E3)↑=17.6 e^{2}fm^6 *48* (1987Ma52).
9.49×10^3[a]	5/2$^-$		See B(E3)↑=6.5 e^{2}fm^6 *10* (1987Ma52).
9.71×10^3[a]	7/2$^+$		
9.86×10^3[a]	(5/2$^-$)	<10 keV	Γ: (1987Ma52). Unresolved with 9880 (1987Ma52).
9.88×10^3[a]	(1/2$^-$)		Unresolved with 9860 (1987Ma52).
11.04×10^3[a]			Unresolved with 11080 (1987Ma52).
11.08×10^3[@a]	1/2$^-$	<10 keV	T=3/2 (1983Ra27,1987Ma52) Γ: (1987Ma52). Unresolved with 11040 (1987Ma52). See B(M2)↑=6.1 μ_N^2fm^4 *19* (1983Ra27).
11.71×10^3[‡] *5*			Γ: narrow. E(level): (1977No06).
11.95×10^3[‡] *5*		≈250 keV	E(level),Γ: (1977No06).
12.22×10^3[a] *2*		≤20 keV	E(level),Γ: (1987Ma52).
12.47×10^3[@a]	3/2$^-$	<10 keV	T=3/2 (1983Ra27,1987Ma52) Γ: (1987Ma52). See B(M2)↑=6 μ_N^2 fm^4 *3* (1983Ra27), and if pure E1, B(E1)↑=1.0×10^{-2} e^{2}fm^2 *4* (1983Ra27).
12.66×10^3[‡] *5*		≈90 keV	E(level),Γ: (1977No06).

Continued on next page (footnotes at end of table)

^{17}O(e,e′) 1977No06,1986Ma48 (continued)

^{17}O Levels (continued)

E(level)	J^{π}[b]	Γ	Comments
12.94×10^{3}[a]	1/2^{+}	<10 keV	T=3/2 (1987Ma52) E(level): See also the triplet 12.96×10^{3} keV *5* with Γ≈200 keV (1977No06). Γ: (1987Ma52). Unresolved with 12990 (1987Ma52).
12.99×10^{3}[@a]	5/2^{-}	<10 keV	T=3/2 (1983Ra27,1987Ma52) Γ: (1987Ma52). Unresolved with 12940 (1987Ma52). See B(M2)↑=6 μ_N^2fm^4 *3* (1983Ra27), and if pure E1, B(E1)↑=0.4×10^{-2} e^{2}fm^2 *2* (1983Ra27).
13.58×10^{3}[a] *2*	(11/2^{-})	68 keV *19*	See also E$_x$=13.56 MeV *5* and Γ≈150 keV (1977No06). E(level),Γ: (1987Ma52).
14.14×10^{3}[‡] *10*		≈100 keV	E(level),Γ: (1977No06).
14.23×10^{3}[@&a]	7/2^{-}		T=3/2 (1983Ra27,1986Ma48,1987Ma52) J^{π}: (1986Ma48,1987Ma52). See B(M2)↑=46 μ_N^2fm^4 *7* (1983Ra27), and B(E1)↑<0.01 e^{2}fm^2, from the estimate of longitudinal component (1983Ra27).
14.45×10^{3}[a]			(1987Ma52).
14.72×10^{3}[&a] *2*	9/2^{-}	35 keV *11*	T=3/2 (1983Ra27) E(level),J^{π},Γ: (1987Ma52). E(level): See also E$_x$=14750 keV; J^{π}=9/2^{-} (1983Ra27). See B(M2)↑=27 μ_N^2 fm^4 *10* (1983Ra27).
14.76×10^{3}[‡] *10*		>300 keV	E(level),Γ: (1977No06).
15.10×10^{3}[@]	(3/2^{+},5/2^{+},7/2^{+})		T=3/2 (1983Ra27) See B(M2)↑=0.14 μ_N^2fm^2 *4* (1983Ra27). Γ: Narrow.
15.24×10^{3}[‡] *10*		≈200 keV	E(level),Γ: (1977No06).
15780[&] *20*	(13/2^{-})	<30 keV	T=(3/2) (1986Ma48,1987Ma40) E(level),Γ: (1986Ma48); J^{π}: (1986Ma48,1987Ma40). See B(M4)↑=177 e^{2}fm^8 *17* (1986Ma48). J^{π}: From (1987Mi25): See comments, replies and discussion in (1987Mi25) and (1986Ma48, 1987Ma40). Initially identified in ^{17}O(e,e′) as (9/2^{-}).
16500[&] *20*		≤20 keV	E(level),Γ: (1986Ma48).
16.52×10^{3}[‡] *5*		≈300 keV	E(level),Γ: (1977No06).
17060[&] *20*	(11/2^{-})	<20 keV	J^{π}: From (1987Mi25): See comments, replies and discussion in (1987Mi25) and (1986Ma48, 1987Ma40). Initially identified in ^{17}O(e,e′) as (7/2^{-}). Also see (7/2^{-}) in ^{16}O(p,π+) and (11/2^{-}) in ^{13}C(^{6}Li,d). T=(1/2) from (1987Mi25), see comments in (1986Ma48, 1987Ma40, 1987Mi25). Initially reported as T=(3/2) (1986Ma48,1987Ma40). E(level),Γ: (1986Ma48); See also E$_x$=17090 keV *50*; Γ: narrow (1977No06). See B(M4)↑=76 e^{2}fm^8 *6* (1986Ma48).
17.5×10^{3}?[‡]			E(level): broad: 17.5-19.6 MeV (1977No06: C2).
17920[&] *20*		98 keV *16*	E(level),Γ: (1986Ma48).
18720[&] *20*		87 keV *33*	E(level),Γ: (1986Ma48).
18830[&] *20*		≤20 keV	E(level),Γ: (1986Ma48).
19850[&] *40*		530 keV *150*	E(level),Γ: (1986Ma48).
20140[&] *20*	(11/2^{-})	31 keV *5*	T=1/2 (1986Ma48,1987Ma40) E(level),Γ: (1986Ma48); J^{π}: (1986Ma48,1987Ma40).

Continued on next page (footnotes at end of table)

^{17}O(e,e′) 1977No06,1986Ma48 (continued)

^{17}O Levels (continued)

E(level)	Jπ[b]	Γ	Comments
			See B(M4)↑=349 e^{2}fm^8 *18* (1986Ma48). Jπ: From (1987Mi25): See comments, replies and discussion in (1987Mi25) and (1986Ma48, 1987Ma40). Initially identified as 13/2⁻ but later assigned 11/2⁻.
20.5×10^3 ‡			E(level): (1977No06).
20700& *20*	(9/2⁻)	<20 keV	T=(3/2) (1986Ma48,1987Ma40) E(level),Γ: (1986Ma48); Jπ: (1986Ma48,1987Ma40). See B(M4)↑=177 e^{2}fm^8 *10* (1986Ma48). Jπ: From (1987Mi25): See comments, replies and discussion in (1987Mi25) and (1986Ma48, 1987Ma40). Initially identified as 11/2⁻ but later assigned 9/2⁻.
22.0×10^3?‡			E(level): doublet (1977No06: C1).
23.0×10^3 ‡			E(level): (1977No06: C1).

† (1975Ki15).
‡ (1977No06).
\# (1978Ki01).
@ (1983Ra27).
& (1986Ma48).
a (1987Ma52).
b See discussion on 5p-4h, 3p-2h and 1p-0h configuration mixing for positive parity states and 4p-3h and 2p-1h mixing for negative parity states.

$^{17}O(\pi^+,\pi^{+\prime}),(\pi^-,\pi^{-\prime})$ 1984Bl17

1984Bl17: Differential cross sections for $\pi^{\pm}$ scattering were measured from E_π=164 MeV bombardment of a 75 mg/cm^2, cooled ^{17}O gas target (49.9% ^{17}O, 26.9% ^{16}O, 23.2% ^{18}O; 120° K temperature and 2 atm pressure) with the EPICS system/LAMPF. The energy resolution was ≈150 keV (FWHM) and the spectrometer′s angular acceptance was ≈3°. Spectra were taken between θ=18°−48°, 56°, 65°, and 74° in 6° steps covered a range of 30 MeV in excitation energy (pion energy loss). Angular distributions to ^{17}O states were analyzed by DWIA. Evidence was suggested for E2 strength near 8 MeV and for M4 strength to two states at E_x=15.7 and 17.1 MeV.

See also (1983BlZX).

Theory:

1975Pa06: $^{17}O(\pi,\pi)$; calculated hyperfine interaction.

1977Si01: $^{17}O(\pi,X)$, E≈190 MeV; calculated pion induced nucleon knockout σ.

1981Os04: $^{17}O(\pi^{\pm},\pi^0)$, E=130-250 MeV; calculated total σ(E), $\sigma(\theta)$; deduced importance of Δ-isobar property renormalizations. Glauber theory, shell model configurations, Woods-Saxon single particle functions.

^{17}O Levels

E(level)†	J^π†	E(level)†	J^π†	E(level)†	J^π†	E(level)†	J^π†
0.87×10^3	$1/2^+$	5.22×10^3	$9/2^-$	6.86×10^3	$(7/2^-)$	8.40×10^3	
3.05×10^3	$1/2^-$	5.38×10^3	$3/2^-$	7.58×10^3	$7/2^-$	15.7×10^3	$13/2^-$
3.85×10^3	$5/2^-$	5.69×10^3	$7/2^-$	7.76×10^3	$11/2^-$	17.1×10^3	$11/2^-$
4.55×10^3	$3/2^-$	5.73×10^3	$(5/2^-)$	8.09×10^3			

† From (1984Bl17).

^{17}O(p,p′) 1972Le28

1972Le28: ^{17}O(p,p), E=65 MeV; measured $\sigma(\theta)$; deduced optical model parameters. Enriched gas target. See also (1972Le27: analysis).
1975Cr04: ^{17}O(p,p′), E=8.5-10.5 MeV; measured σ(E; Ep′,θ); deduced optical model parameters. Enriched target.
1980Fa07: ^{17}O(p,p), E=35.2 MeV; deduced ^{17}O quadrupole deformation parameter.
See also (1976Co01, 1978Am05: theory).

^{17}O Levels

E(level)†
0‡
0.87×10^{3}‡
3.06×10^{3}‡

† Excited states of ^{17}O*(3.06,3.84,4.56,5.08,5.22,5.38,5.70 MeV) observed in (1972Le28) are unresolved.
‡ Observed in (1975Cr04).

^{17}O(^{3}He,^{3}He)

1968Ha30: ^{17}O(^{3}He,t), elastic, E=17.3 MeV; measured $\sigma(\theta)$.
1970Bo25: ^{17}O(^{3}He,^{3}He), elastic, E=11 MeV; measured $\sigma(\theta)$; deduced optical-model parameters.
1982Ab04: ^{17}O(^{3}He,^{3}He), elastic, E=14 MeV; measured $\sigma(\theta)$; deduced optical model parameters.
1983Le03: ^{17}O(pol. ^{3}He,^{3}He), (pol. ^{3}He,^{3}He′), E=33 MeV; measured $\sigma(\theta)$, A(θ); deduced optical model parameters, deformation parameters. ^{17}O*(0.87). Deformation parameter β=+0.3.
See also (1987Co07: theory).
See also (1976Co27: ^{17}O(α,α), analyzed).
See also (1982Hs01: ^{17}O(n,n′γ), measurement).
See also (2020Na31: ^{4}He(^{17}O,α) E=54.4 MeV; studied ^{21}Ne resonances.

^{17}O Levels

E(level)	Comments
0	
870	β=+0.3 (1983Le03).

^{17}O(^{16}O,^{16}O),(^{16}O,^{16}O′)

1973Ge04: ^{17}O(^{16}O,^{16}O), E=24,28,32 MeV; measured σ(E,θ). See also (1973Ge13).
1974Ge01: ^{17}O(^{16}O,^{16}O′), E(lab)=22,24,28,32 MeV; measured $\sigma(\theta)$, for θ(cm)=129° measured σ(E); enriched targets.
See also (1974Ba46,1974Bo13,1975Im04,1987Im03,1987Ma22,1988Im02: theory).

^{17}O Levels

E(level)	J^{π}	Comments
0	$5/2^+$	Observed in (1973Ge04).
871	$1/2^+$	Observed in (1974Ge01).

^{18}O(γ,n) 1976Ba41

1976Ba41: ^{18}O(γ,n), E=23.5, 28 MeV bremsstrahlung; measured prompt γ spectrum. ^{18}O GDR deduced decay to levels in ^{17}N, ^{17,16}O, ^{14}C.

See also (1963Fu06,1980Py01).

^{17}O Levels

E(level)†	J^π†	Comments
0	5/2$^+$	
870	1/2$^+$	Bremsstrahlung weighted integrated cross section σ=6.01 MeV·b at Bremsstrahlung endpoint energy $E_{brem.}$=23.5 MeV; σ=6.71 MeV·b at $E_{brem.}$=28 MeV.
3055	1/2$^-$	σ=5.18 MeV·b at $E_{brem.}$=23.5 MeV; σ=8.69 MeV·b at $E_{brem.}$=28 MeV.
3841	5/2$^-$	σ=0.77 MeV·b at $E_{brem.}$=23.5 MeV; σ=1.17 MeV·b at $E_{brem.}$=28 MeV. These values contain admixtures from the decay of the ^{13}C*(3.854 MeV) state.

† From (1976Ba41).

^{18}O(p,d) 1973Pi09

1963Le03: ^{18}O(p,d), E_p=17.6-20 MeV; angular distributions were taken and absolute differential cross sections were obtained; reduced widths and spectroscopic factors were calculated.
1967Lu05: A proton beam at E=18.2 MeV, from the Livermore variable energy cyclotron, impinged on an oxygen enriched target gas cell (99.06% ^{18}O, 0.35% ^{18}O^{17}O, 0.59% ^{18}O^{16}O). A telescope consisting of a transmission type surface barrier ΔE detector and a lithium-drifted Si E detector was used to detect particles. DWBA analyses were performed and energy levels of ^{17}O*(0,0.871,3.058,3.846(J^{π}=5/2$^-$) MeV) were obtained. There was no evidence of a simple pick-up reaction leading to the state of ^{17}O*(3.846 MeV: J^{π}=5/2$^-$).
1973Pi09: ^{18f}O(pol. p,d), E=24.4 MeV; measured σ(Ed,Et,θ), A(θ). Deduced reaction mechanism. ^{17}O levels deduced S.
1974Pi05: ^{18}O(p,d), E=20-45 MeV; measured σ(Ed,θ), deduced optical model parameters. ^{17}O levels deduced L, J, π.
1977Oh02: ^{18}O(p,d), E=51.9 MeV; measured σ(Ed,θ). ^{17}O levels deduced L, S. Enriched ^{18}O target.

Theory:
1970Hi15: ^{17}O; calculated negative-parity levels, S for ^{18}O(p,d). Particle-hole formalism.
1973Ig02: ^{18}O(p,d), calculated σ(θ).
1973Or09: ^{18}O(p,d), E=17.6 MeV; calculated σ(Ed,θ).
1977Bo42: ^{18}O(p,d), E=17.6 MeV; calculated σ(θ).

^{17}O Levels

E(level)[†]	J^{π}[†]	L	S[b]	Comments
0[‡#@&a]	5/2$^+$	2	1.31	L: See (1963Le03,1973Pi09).
870[‡#@&a]	1/2$^+$	0	0.07	L: See (1963Le03,1973Pi09).
3050[‡#@&a]	1/2$^-$	1	0.88	L: See (1963Le03,1973Pi09).
3840[@&a]	5/2$^-$	3		L: See (1973Pi09).
4550[&a]	3/2$^-$	1	0.14	L: See (1973Pi09).
5080[a]	3/2$^+$	2	0.13	L: See (1973Pi09).
5220[a]	(7/2,9/2,11/2)$^-$			L: See (1973Pi09).
5380[a]	3/2$^-$	1		L: See (1973Pi09).

† Nominal level energy and J^{π} values listed in (1973Pi09).
‡ Observed in (1963Le03).
# Observed in (1977Oh02).
@ Observed in (1967Lu05).
& Observed in (1974Pi05).
a Observed in (1973Pi09).
b Mean values from (1973Pi09).

^{18}O(d,t) 1977Ma10

1961Ar06: ^{18}O(d,t), E=15 MeV; angular distributions of triton groups corresponding to the ^{17}O*(0,0.871,3.846,4.555,5.083, and 5.378-MeV) states are obtained.
1963Ro12: The distorted wave Born approximation is used to analyse the reactions ^{18}O(d,t) and ^{18}O(d,p)^{19}O. Assignments of L values obtained from Butler theory are confirmed.
1977Ma10: A beam of deuterons at E=52 MeV from the Karlsruhe isochronous cyclotron impinged on a 98% enriched $^{18}O_2$ gas target. The tritons were detected with ΔE-E counter telescopes with an energy resolution of 90 keV FWHM and were measured between θ=8° and 50°. Spectroscopic factors were obtained by a DWBA analysis. Energy levels of ^{17}O up to 25 MeV, J^π, L and T values were also deduced.
1978Fo05: An E=17 MeV deuteron beam from the University of Pennsylvania FN tandem Van de Graaff accelerator bombarded once a solid target WO_3 and once a gaseous O_2 target. In both experiments elastic and inelastic deuterons were detected at θ=45° relative to the beam. The absolute cross sections were measured. Spectroscopic factors deduced by DWBA analysis for ^{17}O ground state (5/2$^+$) and the first excited state (1/2$^+$) are 1.48 and 0.29, respectively.
1981Ma14: ^{18}O(pol. d,^{3}He); E=52 MeV; measured iT_{11}(E(^{3}He),θ). ^{17}O deduced levels, J, π, S. Enriched targets. DWBA, Nilsson model analyses.
See also (1961Vl02,1977FoZZ,1979KnZQ) and (1975Hs01,1976La13: theory).

^{17}O Levels

E(level)[†]	J^π[†]	L[‡]	C^2S[‡]	Comments
0[#@&]	5/2$^+$	2	1.53	L: See also (1961Ar06,1963Ro12). Spectroscopic factor (DWBA) S(5/2$^+$)=1.48 *27* (1978Fo05).
871[#@&]	1/2$^+$	0	0.21	L: See also (1961Ar06,1963Ro12). Spectroscopic factor (DWBA) S(1/2$^+$)=0.29 *5* (1978Fo05). The ratio of S(1/2$^+$)/S(5/2$^+$)=0.195 *15* which is in disagreement with the theoretical value of 0.267 (1976La13).
3055[#&]	1/2$^-$	1	1.08	
3841[#@&]	5/2$^-$	3		L: from (1961Ar06,1963Ro12); see also (1977Ma10: >2).
4554[#@&]	3/2$^-$	1	0.12	L: See also (1961Ar06,1963Ro12).
5083[#@&]	3/2$^+$	2	0.10	L: See also (1961Ar06,1963Ro12).
5377[#@&]	3/2$^-$	1	0.53	L: See also (1961Ar06,1963Ro12).
5935[&]	1/2$^-$	1	0.06	
6859				L: L≠1 (1977Ma10).
7380	(5/2$^-$,5/2$^+$)			E(level),J^π: unresolved doublet (1977Ma10). L: L≠2 (1977Ma10).
8213[&]	3/2$^-$	1	0.15	
8703[&]	3/2$^-$	1	0.10	
9160[&]	1/2$^-$	1	0.10	
11082[&]	1/2$^-$[a]	1	0.96	T=3/2 (1981Ma14)
11410[&] *10*		(1)	0.04	T=1/2 (1977Ma10)
12120[&] *10*		(1)	0.24	T=1/2 (1977Ma10)
12471[&]	3/2$^-$[a]	1	0.24	T=3/2 (1981Ma14)
12760[&] *10*		(1)	0.17	T=1/2 (1977Ma10)
12950[&]	1/2$^+$[a]	0	0.19 *5*	T=3/2 (1981Ma14)
13640[&]	5/2$^+$[a]	2	0.29 *12*	T=3/2 (1981Ma14) J^π: See also (5/2$^+$) (1977Ma10).
16580[&] *10*	3/2$^-$[a]	1	0.93	T=3/2 (1977Ma10,1981Ma14) J^π: See also (1/2$^-$,3/2$^-$) (1977Ma10).
18140[&] *10*	3/2$^-$[a]	1	0.17	T=3/2 (1977Ma10,1981Ma14) J^π: See also (1/2$^-$,3/2$^-$) (1977Ma10).

Continued on next page (footnotes at end of table)

^{18}O(d,t) 1977Ma10 (continued)

^{17}O Levels (continued)

† See nominal level energy values listed in, for example, (1977Ma10) except where noted. J is consistent with DWBA analysis in (1977Ma10).

‡ From (1977Ma10) except where noted.

Observed in (1961Ar06). However, the triton group corresponding to the 3.06-MeV state was not observed at $8^{\circ}<\theta_{lab}<37^{\circ}$.

@ Observed in (1963Ro12).

& Observed/measured(with uncertainty) in (1977Ma10). The authors find agreement with (1971Aj) within ≈10 keV and use this as the basis for their uncertainty; this may be an underestimate?

^{a} From (1981Ma14: ^{18}O(pol. d,^{3}He)); deduced from combining with the results of a parallel ^{18}O(d,^{3}He)^{17}N and ^{18}O(d,t)^{17}O measurement (1977Ma10).

^{18}O(^{3}He,α) 1969De06

1969De06: An E(^{3}He)=16 MeV beam from the Heidelberg E(n) Tandem Van de Graaff accelerator bombarded a target containing 10 μg/cm^{2} of ^{18}O and ≈6 μg/cm^{2} of ^{16}O. A broad range magnetic spectrograph was used to analyze α-particles. The α-particle spectrum was obtained at θ=5° and the absolute cross sections were determined with an accuracy of 25%. Eight analogue T=3/2 excited states in ^{17}O were identified. The *l*-transfer values and spectroscopic factors were also deduced for four of these states.

1970Mc02: Branching ratios were measured for the decays of the lowest T=3/2 levels of ^{17}F and ^{17}O to the ground state and unresolved 6.05- and 6.13-MeV levels of ^{16}O. The experiment was performed by bombarding a nickel oxide target (98% ^{18}O enriched) with an E=12 ^{3}He ion beam. Alpha particles were detected at θ=10° with a double-focusing magnetic spectrometer.

The branching ratios for transition ^{17}O*(11.08 MeV)→^{16}O$_{g.s.}$ and ^{17}O*(11.08 MeV)→^{16}O*(6.05+6.13 MeV) are (0.91 *15*) and (0.05 *2*), respectively. The ratios of the reduced widths (θ^{2}) decaying to ^{16}O levels, Θ^{2}(g.s.)/θ^{2}(6.05)=3.4 *14* and Θ^{2}(g.s.)/θ^{2}(6.13)=0.32 *14* were also deduced. The width of ^{17}O*(11.08 MeV) state is <20 keV (D.C. Hensly, Ph.D. thesis, Caltech (1969) unpublished).

1973Ad02: ^{18}O(^{3}He,nα), E=12 MeV; measured σ(E$_{n}$,E$_{\alpha}$,$\theta(\alpha)$,θ(n))nα-coin. ^{17}O deduced level-width(n).

^{17}O Levels

E(level)†	J$^{\pi}$‡	Γ	L‡	C^{2}S#	Comments
11082 *6*	(1/2)$^{-}$	5 keV *1*	1	0.49	Γ: from (McDonald et al., Bull. Amer. Phys. Soc. 16, 489 (1971) ^{13}C(α,n))). See also <20 keV (D.C. Hensly, Ph.D. thesis, Caltech (1969) unpublished). Γ_{n0}/Γ=91 *15* and $\Gamma_{n(1+2)}/\Gamma$=0.05 *2* were deduced in (1973Ad02). Also θ^{2}(g.s.)/θ^{2}(6.13)=0.31 *14* (1973Ad02); these compare with θ^{2}(g.s.)/θ^{2}(6.05)=3.4 *14* and θ^{2}(g.s.)/θ^{2}(6.13)=0.32 *14* (1970Mc02). The value $\Gamma_{\alpha 0}$=0.3 keV is deduced using the measured (1973Ad02) neutron branching ratios and the width from McDonald; however in the present evaluation we adopt a different Γ=2.4 keV *3* and Γ_{n0}/Γ=81 *6*. This changes the interpretation.
12471 *5*	(3/2)$^{-}$		1	0.27	
12950 *8*	1/2^{+}		0	0.096	
12994 *8*					
13640 *5*	(5/2)$^{+}$		2	0.39	
14219 *8*					
14282 *12*					
15101 *8*					

† From (1969De06); T=3/2 states.
‡ From (1969De06).
# Calculated assuming C^{2}S=4 for ^{15}O*(6.18 MeV) in ^{16}O(^{3}He,α)^{15}O.

^{19}F(n,t),(d,α),(α,^{6}Li) 2015Fa12

1968Re07: ^{19}F(n,t), E=14.4 MeV; measured $\alpha(E_t,\theta)$.

2011Ko29: ^{19}F(n,t), E=14.2 MeV; measured reaction products; deduced $\sigma(\theta,E)$.

1960Hu10: The experiment was performed at the Osaka University 44-inch cyclotron from an E=11.4 MeV deuteron beam bombardment of a Teflon film (0.9 mg/cm^2) at θ_{lab}=30°. Alpha particles were detected by a thin uniform CsI(Tl) crystal on a R. C. A. 6342 photomultiplier. The angular distributions were measured at $\theta_{c.m.}\approx$25°−16−°. The ^{17}O ground state and the first excited state (0.872 MeV) were observed.

1960Ri05: ^{19}F(d,α), E=1.8 MeV; $Q_{g.s.}$ for ^{17}O=10.059 MeV *10*. ^{17}O*(0.878 *6*, 3.071 *12*, 3.866 *10*, 4.570 *30*, 5.245 *12*, 5.408 *20*, 5.726 *8*, 5.758 *15*, 5.897 *12*, 5.961 *20* MeV) observed (see Table 3)).

1961Ci02: An E_d=13 MeV beam impinged on a 7-10 mg/cm^2 Teflon foils in a 30 cm diameter scattering chamber at the Center of Nuclear Physics in Cracow, Poland/120 cm cyclotron. Particles were detected by a thin scintillator placed at a distance of 30 cm from the target and identified by a 100-channel amplitude analyzer with the energy resolution of ≈7-9%. The absolute cross sections were measured by means of a beam integrator with a reliability better than 5%. The excitation functions of ^{17}O ground state (l=2, 4) and the first excited state (l=0 (best fit), 2) were observed at θ_{lab}=25°−145°.

1962Ta07: A deuteron beam of E=14.7 MeV obtained from the Kyoto University 105 cm cyclotron bombarded a 0.76 mg.cm^2 Teflon film. A solid state detector of the Si p-n junction of RCA Vicotr Type-C operated with the reverse bias voltage of 200 volts was used to detect α particles with the angular spread ±1.5°. The alpha spectrum was measured and the uncertainty of the absolute differential cross setions was estimated to be <30%. Excitation functions of ^{17}O*(g.s.(5/2$^+$),0.87(1/2$^+$),3.058(1/2$^-$),3.846(7/2) and 4.555 MeV(3/2$^-$)) were deduced.

1964Ja08: Deuterons at E=2-3 MeV from the University of Texas electrostatic accelerator at Balcones Research Center impinged on a target, prepared by vacuum evaporation of calcium fluoride onto a 0.2 mg/cm^2 gold foil. The thickness of the calcium fluoride was ≈40 keV at 2.5 MeV based on energy resolution of the observed α-particles. Alpha particles were detected using a semiconductor detector and were analyzed by a 100-channel pulse-height analyzer. The differential cross sections of the five lowest states in ^{17}O were measured at θ_{lab}=70° with an uncertainty of 50% (for the absolute cross sections) and of ±8% (for the relative cross sections). Total cross sections were compared with 2I+1 rule where I is the spin of the residule nucleus.

1964Ma04: The angular distributions for the reaction ^{17}F(d,α)^{17}O*(0,0.872 MeV) were measured from an E_d=27.5 MeV *1* beam bombardment of a 1.13 mg/cm^2 *4* Teflon film at the 180-cm Buenos Aires cynchrocyclotron. Measurements were performed at θ_{lab}=15°−12−°, in 5° intervals for the forward, and 10° intervals for the backward hemisphere. Alpha particles were detected using a solid-state detector with a energy resolution of ≈1%.

1965Co07,1965Co09: The differential cross sections for the ^{19}F(d,α) reaction were measured at the Purdue University/37-inch cyclotron. Thin Teflon targets (370-720 μg/cm^2) were bombarded with 9.2-MeV deuteron beams. Alpha particles were detected using Si surface-barrier detectors and were identified with a 256-channel pulse-height analyzer. The azimuthal acceptance angle of the detector was 2.3° and the nominal solid angle subtended by the detector was 0.001 sr. Alpha spectra were obtained at 46 angles in the range of θ_{lab}=10°−172.5°. The systematic uncertainty of the absolute cross sections is ±15%. The energe levels of ^{17}O ground state and the lowest four excited states were observed. The 2I+1 rule was discussed.

1965El01: Deuterons at E=1-2.5 MeV produced by the 2.5 MeV electrostatic accelerator of the UAR Atomic Energy Establishment impinged on a 0.7 mg/cm^2 CaF_2 target (evaporated on a thin silver backing). The emitted α particles were detected using a semiconductor detector and were fed into a ORTEC-100α-40 charge amplifier and a 400 or 512-channel pulse-height analyzer with the resolution ≤1%. The ground state and the first nine excited states of ^{17}O were deduced.

1965St14: A beam of 950-1250 keV deuterons, from the 1.5 MeV Cockcroft-Walton accelerator/Boris Kidrich Institute bombarded a 0.35 mg/cm^2 CaF_2 (evaporated on nickel) target. Reaction particles were detected using Si surface-barrier counters and were fed to the amplifiers (ORTEC type 103, 203) and a 512-channel pulse-height analyzer. The energy resolution for the α_0 group was about 100 keV. The α_{1-3} groups have total cross sections consistent with the 2J+1 law as expected. The ground state and the first four excited states of ^{17}O were resolved.

1966We04: A deuteron beam at E=5.5, 6.5, 7.5, 8.5, 9.5 and 11.5 MeV from the Lawrence Radiation Laboratory/90-in. variable-energy cyclotron impinged on a 0.60 mg/cm^2 Teflon (Cf_2) target. Three Si surface-barrier detectors, mounted in fixed positions on a curved brass arm at 10° intervals, covered a solid angle $\Delta\Omega$=0.406×10^{-3} sr with an angular spread of ±0.6°. Alpha particles were observed by a solid-state counter. Angular distributions for the ground and first four excited states of ^{17}O were measured at θ_{lab}=7.5°−163° in 5° intervals. Reasonable fits by DWBA theory were obtained only for the $^{17}O_{g.s.}$ state distributions at higher bombarding energies.

1968Bi09: ^{19}F(d,α), E=2.0,2.2 MeV; measured $\sigma(E_\alpha,\theta)$; deduced ^{17}O level properties.

1968Pr04: The differential cross sections corresponding to the production of the first three and first two residual states in the

^{19}F(n,t),(d,α),(α,^{6}Li) 2015Fa12 (continued)

reactions ^{19}F(d,α)^{17}O and ^{15}N(d,α)^{13}C were measured at θ=17°−170° and θ=17°−112°, respectively. A deuteron beam at E=21.0 MeV *1* bombarded either a ^{19}F target (1.43 mg/cm^2 *5* comercial films of Teflon, Cf_2) or a ^{15}N gas target (99% purity) at the Lewis Research Center. The over-all energy resolution was ≈300 keV FWHM and the systematic error in the absolute differential cross section was ≈15%. The angular distributions were fitted by the cutoff DWBA calculations and the best fit was obtained for the ^{19}F(d,α_1) reaction which proceeded primarily by L=0 orbital-angular-momentum transfer.

1968Ta02: The deuterons accelerated by the 5 MV Van de Graaff accelerator at Tohoku University impinged on a CaF_2 target. Two semi-conductor, suface-barrier detectors separated by 45° were placed on a turntable scattering chamber with an inner diameter, 14 cm. Five lowest states of ^{17}O were observed at θ=90° and 135° for the energy range E_d=0.9-4.25 MeV in steps of 50 keV. The 2J+1 rule was also examined.

1968Za03: ^{19}F(d,α), E=2.4-3.95 MeV; measured σ(E; E_α,θ), observed α_0, α_1, α_2 and α_3; deduced reaction mechanism.

1969Li22: The deuterons produced in the 3 MeV Van de Graaff Accelerator at the National Tsing Hua University in China, impinged on a 150 μg/cm^2 CaF_2 target. A surface-barrier Si detector (SSD) was used to detect α particles. The excitation functions were measured with E_d=1.35-2.15 MeV in steps of 50 keV at θ_{lab}=90° and 160°. The angular distributions of four α groups, α_{0-3} were measured at θ=50°−160° in 10° intervals and compared with the 2I+1 rule where I is the spin of the residual nucleus.

1969Me07: A beam of 300-650 keV deuterons, from the cascade generator of ATOMKI/Institute of Nuclear Research, Debrecen, Hungary impinged on a 0.5 mg/cm^2 CaF_2 target (evaporated onto a Cu foil). The α_{0-3} angular distributions were measured at ten different energies with a plastic track detector and a semiconductor detector (ORTEC SBCJ-25-300).

1970So12: ^{19}F(d,$\alpha_{0,1,2,3}$), E=600,650 keV; measured σ(E_α,θ).

1972La18: ^{19}F(d,α),(d, p), E=3 MeV; measured σ(Ep,θ).

1976Bi03: ^{19}F(d,α), E=2.34-14.45 MeV; measured σ(E,Eα,θ); deduced reaction mechanism.

1979An35: ^{19}F(pol. d,α), E=1.8-3 MeV; measured σ(Eα), analyzing power iT11(E,θ_α), iT11(E,θ_d).

1981Ma46: ^{19}F(d,α), E=410.7 keV-1.9 MeV; measured products, ^{17}O, 2-He-4; deduced σ(θ).

2000El08: ^{19}F(d,α), E=0.7-3.4 MeV; measured Eγ, Iγ; deduced thick target γ-ray yields.

2012Pa34: ^{19}F(d,α), E=1.8-3 MeV; measured Eα, Iα; deduced σ(θ). Comparison with available data, SIMNRA code calculations.

2015Fa12: XUNDL dataset compiled by TUNL, 2015.

The authors studied ^{17}O levels in the E_x=4 to 8 MeV to better characterize their roles in astrophysical neutron production, via the ^{13}C(α,n) reaction , and absorption, via the ^{16}O(n,γ) reaction.

A beam of 22 MeV deuterons, from the Maier-Leibnitz Laboratory in Munich, impinged on a 46 μg/cm^2 ^{6}LiF target that was evaporated onto a 12 μg/cm^2 carbon backing. The reaction products were momentum analyzed using a Q3D spectrograph and detected in the focal plane with a position sensitive proportional counter. Measurements were carried out at θ=10° and 15° covering E_x=3750 to 6200 keV and 5500 to 7800 keV, respectively, with an energy resolution of 20 keV (FWHM) that was mainly attributed to the energy loss difference of d′s and α′s in the target. The peaks of the spectrum were fitted with a convolution of Lorentzian and Gaussian shapes; for broader shapes, the Lorentzian Γ was deduced, for narrower resonances only the FWHM is provided.

The present results are compared with literature values and discussed in the context of their astrophysical relevance. Particular attention is given to the parameters of the E_x≈6360 keV state, which is closest to the ^{13}C(α,n) threshold at 6358.69 keV.

See also (1962Fo02).

1968Mi05: ^{19}F(α,^{6}Li), a study leading to the ground and first excited states of ^{17}O.

1995Fa21: ^{19}F(α,^{6}Li), E=27.2 MeV; measured σ(θ); deduced model parameters, spectroscopic factors. Finite-range DWBA.

^{17}O Levels

Notes:

Bu51: Proc. Roy. Soc. A209, 478 (1951). ^{19}F(d,α) E_d=7.9 MeV.

Wa52: Phys. Rev. 88, 1324 (1952).

Go56: Physica 22, 1159,73. (1956).

Atomic mass of ^{17}O=17.000139 u *12* (1960Ri05).

For the ground state and up to the fifth excited states observed, see also (1960Hu10, 1961Ci02, 1962Ta07, 1964Ja08, 1964Ma04, 1965Co07, 1965Co09, 1965St14, 1966We04, 1968Pr04, 1968Ta02, 1968Za03, 1969Li22, 1969Me07, 1972La18, 1976Bi03, 1981Ma46, 2012Pa34). See also (1968Mi05: ^{19}F(α,^{6}Li)^{17}O*(g.s.,0.873), 1995Fa21: ^{19}F(α,^{6}Li)$^{17}O_{g.s.}$).

Continued on next page (footnotes at end of table)

^{19}F(n,t),(d,α),(α,^{6}Li) 2015Fa12 (continued)

^{17}O Levels (continued)

E(level)[†]	J^{π}[‡]	Γ[†]	L	FWHM (keV)[†#]	Comments
0[bc]	5/2$^+$		2,4		L: See (1960Hu10,1961Ci02,1962Ta07,1965St14,1968Pr04, 1976Bi03).
879.0[bc] *52*	1/2$^+$		0,2		E(level): wieghted average from (Bu51: 870 keV *50*), (Wa52: 883 keV *11*) and (1960Ri05: 878 keV *6*). See also E_x=870 keV 20 (Bu51: mean energy value of ^{19}F(d,α) and ^{16}O(d,p) reaction calculations.). L: See (1961Ci02,1962Ta07,1968Pr04,1976Bi03).
3069.2[b] *76*	1/2$^-$		1		E(level): wieghted average from (Bu51: 3030 keV *60*), (Wa52: 3069 keV *10*) and (1960Ri05: 3071 keV *12*). See also E_x=3060 keV 30 (Bu51: mean energy value of ^{19}F(d,α) and ^{16}O(d,p) reactions calculations.). L: See (1968Pr04).
3842.9[@ab] *4*	5/2$^-$			21.52 *21*	E(level): See also E_x(keV)=3830 *40* (Bu51), 3850 *30* (Bu51: mean energy value of ^{19}F(d,α) and ^{16}O(d,p) reaction calculations), 3856 *11* (Wa52) and 3866 *10* (1960Ri05).
4551.4[&ab] *7*	3/2$^-$	38.1 keV *28*		48.2 *17*	E(level): See also E_x(keV)=4560 *30* (Bu51), 4580 *20* (Bu51: mean energy value of ^{19}F(d,α) and ^{16}O(d,p) reaction calculations), 4567 *14* (Wa52) and 4570 *30* (1960Ri05).
5087.7[&] *10*	3/2$^+$	88 keV *3*		93.4 *26*	E(level): See also E_x(keV)=5080 *30* (Bu51), 5070 *20* (Bu51: mean energy value of ^{19}F(d,α) and ^{16}O(d,p) reaction calculations).
5216.5[@ab] *4*	9/2$^-$			21.6 *5*	E(level): See also E_x(keV)=5310 *60* (Bu51), 5310 *20* (Bu51: mean energy value of ^{19}F(d,α) and ^{16}O(d,p) reaction calculations), 5229 *13* (Wa52), 5245 *12* (1960Ri05) and (1965El01: 5.23+5.40 MeV unresolved).
5388.8[&b] *6*	3/2$^-$	39.0 keV *21*		49.4 *11*	E(level): See also E_x(keV)=5397 *14* (Wa52) and 5408 *20* (1960Ri05).
5697.5[@ab] *5*	7/2$^-$			21.97 *14*	E(level): See also E_x(keV)=5660 *30* (Bu51), 5760 *20* (Bu511: mean energy value of ^{19}F(d,α) and ^{16}O(d,p) reaction calculations), 5723 *14* (Wa52) and 5726 *8* (1960Ri05).
5731.6[@ab] *4*	(5/2$^-$)			21.97 *14*	E(level): See also E_x(keV)=5758 *15* (1960Ri05) and (1965El01: 5.71+5.86+5.85 MeV unresolved).
5869.7[@a] *6*	3/2$^+$			25.2 *7*	E(level): See also E_x(keV)=5875 *15* (Wa52) and 5897 *12* (1960Ri05).
5931.0[&] *11*	1/2$^-$	33 keV *5*		44.7 *30*	E(level): See also E_x(keV)=5947 *15* (Wa52) and 5961 *20* (1960Ri05).
6363.4[&] *31*	1/2$^+$	136 keV *5*		139 *4*	E(level): See also E_x(keV)=6210 *30* (Bu51) and 6240 *20* (Bu51: mean energy value of ^{19}F(d,α) and ^{16}O(d,p) reaction calculations).
6860.7[@a] *4*	(5/2$^+$)			18.8 *7*	E(level): See also E_x(keV)=6910 *30* (Bu51), 6890 *30* (Bu511: mean energy value of ^{19}F(d,α) and ^{16}O(d,p) reaction calculations) and 6869 *14* (Wa52).
6972.6[@a] *4*	(7/2$^-$)			18.8 *4*	E(level): See also E_x(keV)=(6986 *15*) (Wa52).
7165.4[@a] *18*	5/2$^-$			20.0 *5*	
7216[&] *4*	3/2$^+$	262 keV *7*		264 *7*	
7380.1[@] *4*				19.8 *5*	Unresolved E_x=7379 (5/2$^+$) and 7382 (5/2$^-$) states. E(level): See also E_x(keV)=(7371 *15*) (Wa52).
7510 *30*	3/2$^-$				E(level): from (Bu51).
7573.5[@a] *6*	(7/2$^+$)			18.4 *12*	

Continued on next page (footnotes at end of table)

^{19}F(n,t),(d,α),(α,^{6}Li) 2015Fa12 (continued)

^{17}O Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	Γ[†]	FWHM (keV)[†#]	Comments
7689.2[&a] *6*	7/2^{-}	12 keV *4*	25.1 *13*	
7763.6[@a] *4*	11/2^{-}	<4 keV	18.1 *7*	
8270? *40*				E(level): from (Bu51).
8590? *40*				E(level): from (Bu51).
9060? *40*				E(level): from (Bu51).

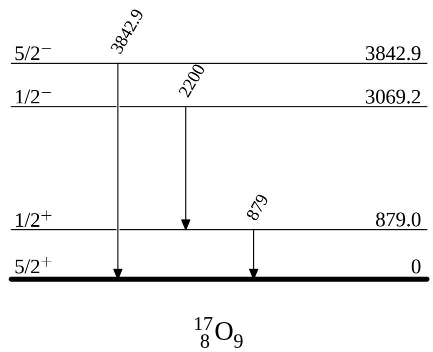
[†] From (2015Fa12) except where noted.
[‡] Nominal values listed in (2015Fa12).
[#] The peaks of the spectrum were fitted with a convolution of Lorentzian and Gaussian shapes; for broader shapes, the Lorentzian Γ was deduced, for narrower resonances only the FWHM is provided and that could be regarded as an upper limit.
[@] Fit with Gaussian shape.
[&] Fit with Lorentzian shape.
[a] Used for energy calibration.
[b] Also observed in (1968Bi09).
[c] Also observed in (1968Re07,2011Ko29).

γ(^{17}O)

E$_{\gamma}$	E$_{i}$(level)	J$^{\pi}_{i}$	E$_{f}$	J$^{\pi}_{f}$	Comments
879	879.0	1/2^{+}	0	5/2^{+}	E$_{\gamma}$: see (2000El08: 870.7 keV).
2200	3069.2	1/2^{-}	879.0	1/2^{+}	E$_{\gamma}$: from (Go56). The absence of the direct ground state decay of the 3.07-MeV state is consistent with J=1/2 (Go56).
3842.9	3842.9	5/2^{-}	0	5/2^{+}	E$_{\gamma}$: from (Go56).

^{19}F(n,t),(d,α),(α,^{6}Li) 2015Fa12

Level Scheme



^{19}F(p,^{3}He) 1967Co05,1974Ne03

1967Co05: Reaction ^{19}F(p,^{3}He) was studied by bombarding a Teflon (Cf$_2$) target with a beam of 30.5 MeV protons from the University of Southern California linear accelerator. Charged particles were detected by a counter telescope consisting of 2 Si surfacs-barrier detectors and were identified by the E-ΔE method. Abosolute differential cross sections were measured at θ=16°−111°. The ground state and the first excited state of ^{17}O*(0.871 MeV) were observed.

1972HuZR: ^{19}F(p,^{3}He), E=45 MeV; measured total σ, $\sigma(\theta)$. ^{17}O transitions deduced L.

1974Ne03: An E$_p$=42.4 MeV beam from the University of Manitoba sector focussed cyclotron impinged on a 2.19 mg/cm^2 (surface density) fluorine target. Two detector telescopes, each consisting of a 200 μm ΔE detector, a 3 mm lithium drifted E-detector and a veto counter, mounted in a 71 cm diameter scattering chamber, were used to detect emitted particles. An Ortec particle identifier units was used to identify particles. The differential cross sections of the reaction ^{19}F(p,^{3}He) corresponding to the levels of ^{17}O*(0, 0.871, 3.055, 3.841) were measured. Comparisons were made with the analog transitions in the mirror reaction ^{19}F(p,t)^{17}F.

^{17}O Levels

E(level)†	J$^{\pi}$†
0‡#	5/2$^+$
871‡#	1/2$^+$
3060#	1/2$^-$
3850#	5/2$^-$

† Nominal values listed in (1967Co05,1974Ne03).
‡ Observed in (1967Co05).
# Observed in (1974Ne03).

^{20}Ne(n,α) 1971Ka18

1946Gr08: ^{20}Ne(n,α), E=2.5 MeV; measured products, ^{17}O deduced σ, σ(E). Q=−0.6 MeV and $\sigma\approx0.005\times10^{-24}$ cm^2.
1951Jo22: ^{20}Ne(n,α), E=1.8-3.3 MeV; measured products, ^{17}O deduced σ, σ(E).
1959Be66: ^{20}Ne(n,α), E=2.8-7.3 MeV; measured cross section for the reaction. Disintegrations were observed leaving ^{17}O in the ground state and in the first three excited states.
1966Ce03: ^{20}Ne(n,α), E=14.2 MeV; measured $\sigma(E_\alpha,\theta)$. Natural target.
1966Mc14: ^{20}Ne(n,α), E=14.1 MeV; measured $\sigma(E_\alpha,\alpha)$. Natural targets.
1971Ka18: ^{20}Ne(n,α), E=14.3 MeV; measured $\sigma(E_\alpha)$. ^{17}O deduced levels.
1971Ba82: ^{20}Ne(n,α), E=14.1 MeV; measured σ, $\sigma(\theta)$.
1972Li30: ^{20}Ne(n,α), E=14.1 MeV; measured $\sigma(E_\alpha,\theta)$. ^{17}O deduced nuclear temperature.
2011KhZW: ^{20}Ne(n,α), E=4-7 MeV; measured E_α, I_α using digital spectrometer; deduced σ to low-lying states.
2012Kh05: ^{20}Ne(n,α), E<7.5 MeV; measured reaction products, E_α, I_α; deduced σ. Comparison with available data.
2012Kh06: ^{20}Ne(n,α), E=4-7 MeV; measured reaction products, E_α, I_α; deduced σ, resonance structures.
2012KhZZ: ^{20}Ne(n,α), E=4-7 MeV; measured reaction products; deduced σ to low-lying states.

Theory:
1983Sa30: ^{20}Ne(n,α), E=low; compiled target thermal distribution energy state to ground state thermonuclear reaction rate of reaction σ vs temperature. Statistical model.
1991Re10: ^{20}Ne(n,α), E=fast; compiled, evaluated reaction σ. Model calculations.
2005Ba78: ^{20}Ne(n,α), E≈2500-5000 keV; analyzed σ; deduced parameters.
2017Sh51: ^{20}Ne(n,α), E=5 MeV; calculated shakeoff probability vs WIMP mass.

^{17}O Levels

Notes:
Angular distributions for the α-particles, the cross sections for the ^{20}Ne(n,α) reaction to many ^{17}O states have been studied at E=2.5-14.2 MeV (1946Gr08, 1959Be66, 1966Mc14, 1971Ba82, 1972Li30, 2011KhZW, 2012Kh05, 2012Kh06, 2012KhZZ).

E(level)†	Comments
0.83×10^3 *9*	
3.18×10^3 *12*	
3.90×10^3 *7*	
4.63×10^3 *12*	E(level): See also E_n=2.45 MeV corresponding to E_x=4720 keV (1951Jo22).
5.214×10^3‡	E(level): from E_n=2870 keV (1951Jo22).
5.55×10^3# *10*	
5.673×10^3‡	E(level): from E_n=3260 keV (1951Jo22).
5.90×10^3 *10*	
7.77×10^3# *15*	

† From (1971Ka18) except where noted.
‡ From (1951Jo22).
# It is possible that each of the peaks from which the levels at 5.55 and 7.77 MeV were determined were actually combinations of two or more transitions, since they are rather broad (1971Ka18).

^{181}Ta(^{18}O,^{17}O) 2020Zi03

2020Zi03, 2021Ci02:

A beam of 126 MeV ^{18}O ions from the GANIL cyclotrons impinged on a 6.64 mg/cm^2 ^{181}Ta target. The ^{17}O ions that scattered at θ=45° (±6°) were momentum analyzed using the VAMOS++ ion tracking system. A collection of γ-ray detectors from the AGATA and PARIS arrays plus two large-volume $LaBr_3$ detectors provided a high granularity for γ-ray energy and angle measurement. The γ-ray detectors were aligned along the VAMOS++ axis at $\theta_{rel.}$=115°−175° (AGATA) and $\theta_{rel.}$=90°(PARIS+$LaBr_3$). The γ rays detected in coincidence with ^{17}O ions in the VAMOS++ spectrometer were analyzed.

The authors developed a Monte Carlo analysis of the Doppler shift attenuation spectrum that accounts for population (and subsequent deexcitation) of levels via low-momentum transfer and deep-inelastic reaction processes. The accuracy of the method relies on the precise angle determination between the scattered projectile and the Doppler-shifted γ ray.

^{17}O Levels

E(level)	$T_{1/2}$	Comments
0.0		
871.		
3055.	110 fs *+28−21*	$T_{1/2}$: From $\tau=159^{+40}_{-30}$ fs and Eγ=2184.3 $^{+3}_{-2}$ in present analysis.
3842.		

γ(^{17}O)

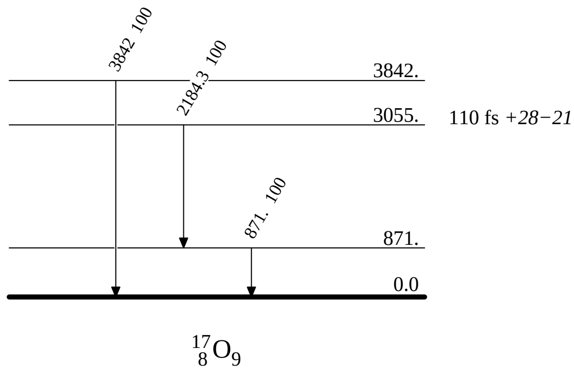
E_i(level)	E_γ†	I_γ	E_f
871.	871.	100	0.0
3055.	2184.3 *3*	100	871.
3842.	3842	100	0.0

† From energy level difference.

^{181}Ta(^{18}O,^{17}O) 2020Zi03

Level Scheme

Intensities: % photon branching from each level



$^{208}Pb(^{17}O,^{17}O')$:CoulEx 1979Es04,1982Ku14

Also include $^{60}Ni(^{17}O,^{17}O')$:CouEx.

1979Es04: $^{54}Fe,^{60}Ni(^{17}O,^{17}O')$, E=59.1,62.1 MeV; deduced B(E2)=2.1×10^{-4} e^2b^2.

1982Ku14: $^{208}Pb(^{17}O,^{17}O')$, E=66-88 MeV; measured $\sigma(E(^{17}O))$, projectile Coulomb excitation probability. ^{17}O level deduced GDR contribution parameter. Modified hydrodynamic model.

1983Li10: $^{208}Pb(^{17}O,^{17}O')$, E=78 MeV; measured $\sigma(\theta)$, $\sigma(E(^{17}O))$; deduced recoil, nonorthogonality effect role. ^{17}O level deduced excitation mechanism. Finite-range coupled-channels calculations.

See also (2001Le23, 2002Pr10, 2004Pa08: exp.) and (1982Ba53, 1989Ba60, 2000Sp07, 2005Ty02, 2007Be54: theory).

^{17}O Levels

E(level)	Comments
0	
871	B(E2)=2.1×10^{-4} e^2b^2 (1979Es04).

REFERENCES FOR A=17

1946Gr08 E.R.Graves, J.H.Coon - Phys.Rev. 70, 101(A6) (1946).
Disintegration Of Neon And Argon By D-D Neutrons.

1948Kn24 N.Knable, E.O.Lawrence, C.E.Leith, B.J.Moyer, R.L.Thornton - Phys.Rev. 74, 1217 (1948).
Delayed Emission of Neutrons from the Decay of N^{17}.

1949Al04 L.W.Alvarez - Phys.Rev. 75, 1127 (1949).
N^{17}*, A Delayed Neutron Emitter.*

1949Br27 H.Brown, V.Perez-Mendez - Phys.Rev. 75, 1286, D5 (1949).
Production of Radioactive Gases by Deuteron Bombardment of Gaseous Targets.

1949Ha55 E.Hayward - Phys.Rev. 75, 917 (1949).
The Energy Spectrum of the Delayed Neutrons from O^{17}.

1950Bo95 C.K.Bockelman - Phys.Rev. 80, 1011 (1950).
Total Cross Sections Of Be, B, O And F For Fast Neutrons.

1951Al08 F.Alder, F.C.Yu - Phys.Rev. 81, 1067 (1951).
On the Spin and Magnetic Moment of O^{17}.

1951Bo45 C.K.Bockelman, D.W.Miller, R.K.Adair, H.H.Barschall - Phys.Rev. 84, 69 (1951).
Total Cross Sections of Light Nuclei for p,T-Neutrons.

1951Jo22 C.H.Johnson, C.K.Bockelman, H.H.Barschall - Phys.Rev. 82, 117 (1951).
Disintegration Of Neon By Fast Neutrons.

1952Th24 R.G.Thomas, T.Lauritsen - Phys.Rev. 88, 969 (1952).
Magnetic Lens Spectrometer Measurements of the Radiations from Light Nuclear Reactions.

1953Ad02 R.K.Adair - Phys.Rev. 92, 1491 (1953).
Spin-Orbit Coupling Energy In O^{17}.

1953He58 N.P.Heydenburg, G.M.Temmer - Phys.Rev. 92, 89 (1953).
Energy levels in F^{18} *from alpha particle reactions in nitrogen.*

1953Ho81 F.Hoyle - Astrophys.J.Suppl.Ser. Sup 1, 121 (1953).
On nuclear reactions occurring in very hot stars. I. The synthesis ofelements from carbon to nickel.

1953Th14 J.Thirion, V.L.Telegdi - Phys.Rev. 92, 1253 (1953).
Lifetime Measurements for the First Excited States of O^{17} *and* B^{10} *from Recoil Studies.*

1954Ko54 M.I.Korsunskii - Uspekhi Fiz.Nauk 52, 3 (1954).
Experimental Bases of the Nuclear Shell Model.

1954Sp01 A.Sperduto, W.W.Buechner, C.K.Bockelman, C.P.Browne - Phys.Rev. 96, 1316 (1954).
(d,p) Reactions from Carbon, Nitrogen, and Oxygen.

1954Th42 L.C.Thompson, J.R.Risser - Phys.Rev. 94, 941 (1954).
Gamma Rays from the Inelastic Scattering of 14-MeV Neutrons in C^{12}*and* O^{16}.

1954Tr09 R.E.Trumble, Jr. - Phys.Rev. 94, 748 C6 (1954).
Alpha-Neutron Reactions in Be^9,B^{11}*, and* C^{13}.

1954Wo20 C.Wong - Phys.Rev. 95, 765 (1954).
Beta Decay of F^{17} *and* C^{11}.

1955Gr68 J.C.Grosskreutz - Phys.Rev. 99, 643 PA1 (1955).
Th Angular Distribution of Protons from the O^{16}*(d,p)*O^{17} *Reaction as a Function of the Bombarding Energy.*

1955Kh35 L.M.Khromchenko - Izvest.Akad.Nauk SSSR, Ser.Fiz. 19, 277 (1955); Columbia Tech.Transl.19, 252 (1956).
Investigation of the Energy Levels of the Light Nuclei by Magnetic Analysis.

1955Ma36 R.J.Mackin, Jr., W.B.Mims, W.R.Mills, Jr. - Phys.Rev. 98, 43 (1955).
Gamma Rays from the Deuteron Bombardment of Carbon-13.

1955Ok01 A.Okazaki - Phys.Rev. 99, 55 (1955).
Scattering Of Polarized Neutrons By Heavy Nuclei.

1956Be98 R.L.Becker, H.H.Barschall - Phys.Rev. 102, 1384 (1956).
Total Cross Sections Of Light Elements For (α, n) *Neutrons.*

1956Bo61 T.W.Bonner, A.A.Kraus, Jr., J.B.Marion, J.P.Schiffer - Phys.Rev. 102, 1348 (1956).
Neutrons and Gamma Rays from the Alpha-Particle Bombardment of Be^9,B^{10},B^{11},C^{13}*, and* O^{18}.

1956Gr37 T.S.Green, R.Middleton - Proc.Phys.Soc.(London) 69A, 28 (1956).
Investigation of Deuteron Induced Reactions by Magnetic Analysis. II.Results for Be^9,C^{12},N^{14}*, and* O^{16}.

1956Sa06 R.M.Sanders - Phys.Rev. 104, 1434 (1956).
Study of the C^{14}*(p,n)*N^{14} *and* $C^{14}$$(\alpha,n)$$O^{17}$ *Reactions.*

1957Bo04 N.A.Bostrom, E.L.Hudspeth, I.L.Morgan - Phys.Rev. 105, 1545 (1957).
Deuteron-Induced Reactions Leading N^{16}.

1957Br82 C.P.Browne - Phys.Rev. 108, 1007 (1957).
Positions and Widths of O^{17} *Levels from* 4^- *to 6-MeV Excitation.*

1957Ka68 R.A.Kamper, K.R.Lea, C.D.Lustig - Proc.Phys.Soc.(London) 70, 897 (1957).
Hyperfine Structure and Nuclear Electric Quadrupole Moment of ^{17}O.

1957St93 M.J.Stevenson, C.H.Townes - Phys.Rev. 107, 635 (1957).
Quadrupole Moment of O^{17}.

REFERENCES FOR A=17(CONTINUED)

1957Wa46 R.B.Walton, J.D.Clement, F.Boreli - Phys.Rev. 107, 1065 (1957).
Interaction Of Neutrons With Oxygen And A Study Of The $C^{13}(\alpha, n)O^{16}$ Reaction.

1958Ar15 S.E.Arnell, J.Dubois, O.Almen - Nuclear Phys. 6, 196 (1958).
Half-Lives of the Positon Emitting Mirror Nuclides.

1958Fo67 J.L.Fowler, H.O.Cohn - Phys.Rev. 109, 89 (1958).
Oxygen Differential Neutron Scattering and Phenomenological Nuclear Potentials.

1958Hu18 D.J.Hughes, R.B.Schwartz - BNL-325, 2nd Ed. (1958); BNL-325, 2nd Ed., Suppl.I (1960).
Neutron Cross Sections.

1958La09 R.O.Lane, J.E.Monahan - Bull.Am.Phys.Soc. 3, No.7, 364, G6 (1958).
Differential Cross Section for Elastic Scattering for Neutrons on O^{16} from 100 keV to 1700 keV.

1958St28 H.R.Striebel, S.E.Darden, W.Haeberli - Nuclear Phys. 6, 188 (1958).
Polarization of $Li^{7}(p,n)Be^{7}$ Neutrons.

1959Aj76 F.Ajzenberg-Selove, T.Lauritsen - Nuclear Phys. 11, 1 (1959).
Energy Levels of Light Nuclei VI.

1959Be66 R.J.Bell, T.W.Bonner, F.Gabbard - Nuclear Phys. 14, 270 (1959).
The disintegration of Ne^{20} by fast neutrons.

1959Fi30 G.E.Fischer, V.K.Fischer - Phys.Rev. 114, 533 (1959).
Study of (d,α) Reactions on Some Light Nuclei.

1959Ha13 H.E.Hall, T.W.Bonner - Nuclear Phys. 14, 295 (1959).
Gamma Radiations from Inelastic Scattering of Fast Neutrons in C^{12},N^{14} and O^{16}.

1959Ha29 E.W.Hamburger - Thesis, University of Pittsburgh (1959).
Study of Some Reactions of 15 MeV Deuterons with the Lithium Isotopes.

1959Lo59 G.Lopez, F.Alba, M.Mazari, M.E.Ortiz - Rev.Mex.Fis. 8, 17 (1959).

1960Al35 N.V.Alekseev, K.I.Zherebtsova, V.F.Litvin, Y.A.Nemilov - Zhur.Eksptl.i Teoret.Fiz. 39, 1508 (1960); Soviet Phys.JETP 12, 1049 (1961).
Stripping Reactions on C^{12}, O^{16}, and Si^{28}.

1960Go20 S.Gorodetzky, G.Sutter, F.Scheibling, P.Chevallier, R.Armbruster - J.Phys.Radium 21, 360 (1960).
Excitation Curves for Gamma Radiation and Internal Conversion Pairs from $F^{19}(p,\alpha)O^{16}$ and Ca^{40}, and Measurement of the Relative Intensity for External Pairs in the Reaction $O^{16}(d,p)O^{17}$.

1960Hu10 C.Hu - J.Phys.Soc.Japan 15, 1741 (1960).
(d,α) Reactions on SOme Light Nuclei.

1960Ja12 J.Janecke - Z.Naturforsch. 15a, 593 (1960).
The Half Lives of Some Positron Emitters with Superpermitted Transitions.

1960Ka10 J.V.Kane, R.E.Pixley, R.B.Schwartz, A.Schwarzschild - Phys.Rev. 120, 162 (1960).
Lifetimes of the First Excited States of F^{17} and O^{17}.

1960Ri05 J.Rickards - Rev.Mex.Fis. 9, 35 (1960).

1960Sh05 S.M.Shafroth - J.Phys.Radium 21, 353 (1960).
Experiments with 2-MeV Lithium Ions.

1960Ts02 K.Tsukada, T.Fuse - J.Phys.Soc.Japan 15, 1994 (1960).
Total Cross Sections of Carbon, Oxygen, Fluorine and Thorium for FastNeutrons.

1961Ar06 J.C.Armstrong, K.S.Quisenberry - Phys.Rev. 122, 150 (1961).
Analysis of Some Deuteron-Induced Reactions in Oxygen-18.

1961Ba10 F.De S.Barros, P.D.Forsyth, A.A.Jaffe, I.J.Taylor - Proc.Phys.Soc.(London) 77, 853 (1961).

1961Bu16 B.Buck, P.E.Hodgson - Phil.Mag. 6, 1371 (1961).

1961Ci02 N.Cindro, M.Cerineo, A.Strzalkowski - Nuclear Phys. 24, 107 (1961).
(d,α) Reactions on Some Light Nuclei at 13 MeV.

1961Fo01 R.Fox, R.D.Albert - Phys.Rev. 121, 587 (1961).
Evidence for Compound Nucleus Formation Using (p,p') and (α,p) Scattering in Nickel.

1961Fo07 D.B.Fossan, R.L.Walter, W.E.Wilson, H.H.Barschall - Phys.Rev. 123, 209 (1961).
Neutron Total Cross Sections of Be,B^{10},B,C, and O.

1961Ha19 E.W.Hamburger - Phys.Rev. 123, 619 (1961).
Study of the Differential Cross Sections of Deutron Stripping Reactions as a Function of the Incident Energy.

1961Hi01 S.Hinds, R.Middleton, A.E.Litherland, D.J.Pullen - Phys.Rev.Letters 6, 113 (1961).
New Isotope of Carbon: C^{16}.

1961Ja23 A.Jaidar, G.Lopez, M.Mazari, R.Dominguez - Rev.mex.fis. 10, 247 (1961).
Determinacion de Las Energias de Excitacion de Los Nucleos Ligeros y Los Primeros Intermedios a Traves de Reacciones (d,p) y (d,α).

1961Jo24 R.G.Johnson, L.F.Chase, Jr., F.J.Vaughn - Proc.Rutherford Jubilee Intern.Conf., Manchester, England, J.B.Birks,Ed., Academic Press Inc., New York, p.591 (1961).
An Investigation of the $C^{13}(He^{3},n_{0})O^{15}$ and the $C^{14}(He^{3},n_{0})O^{16}$ Reactions.

1961Ke01 E.L.Keller - Phys.Rev. 121, 820 (1961).
Deuteron Stripping and Pickup Reactions in Oxygen-16.

1961Ke02 L.Keszthelyi, I.Berkes, I.Demeter, I.Fodor - Nuclear Phys. 23, 513 (1961).

REFERENCES FOR A=17(CONTINUED)

Energy Dependence of the Cross Section of the Nuclear Reaction $O^{16}(\gamma,n)O^{15}$.
1961Pe28 G.J.Perlow, W.J.Ramler, A.F.Stehney, J.L.Yntema - Phys.Rev. 122, 899 (1961).
Delayed Neutrons from N^{17}.
1961Vl02 N.A.Vlasov, S.P.Kalinin, A.A.Ogloblin, V.I.Chuev - Izvest.Akad.Nauk SSSR, Ser.Fiz. 25, 115 (1961); Columbia Tech.Transl.25, 111 (1961).
1961Ya02 H.Yamaguchi - J.Phys.Soc.(Japan)16, 583 (1961).
1962Bl13 J.M.Blair, R.K.Hobbie - Phys.Rev. 128, 2282 (1962).
Differential Cross Sections for the Reactions $C^{12}(Li^6,p)O^{17}$ and $C^{12}(Li^6,d)O^{16}$ from 3.4 to 4.0 MeV.
1962Fo02 J.M.Fowler, J.B.Reynolds, J.J.Wesolowski, R.J.Wilson - Bull.Am.Phys.Soc. 7, No.4, 287, FB16 (1962).
Angular Distributions of α Particles from $F^{19}(d,\alpha)O^{17}$.
1962Ga15 N.H.Gale, J.B.Garg, J.M.Calvert - Nuclear Phys. 38, 222 (1962).
Lifetimes of the First Excited States of B^{10}, O^{17} and F^{17} (I).
1962Ga16 N.H.Gale - Nuclear Phys. 38, 252 (1962).
Lifetimes of the First Excited States of B^{10}, O^{17} and F^{17} (II).
1962Ha40 B.G.Harvey, J.Cerny, R.H.Pehl, E.Rivet - Nuclear Phys. 39, 160 (1962).
Levels Involving A $(d_{5/2})^2_5$ State in Light Nuclei.
1962Ma23 S.Matthies, V.G.Neudachin, Yu.F.Smirnov - Zhur.Eksptl.i Teoret.Fiz. 42, 592 (1962); Soviet Phys.JETP 15, 411 (1962).
1962Ma25 S.Mayo, J.E.Testoni - Nuclear Phys. 36, 615 (1962).
1962Ta07 K.Takamatsu - J.Phys.Soc.Japan 17, 896 (1962).
1963Al04 R.Almanza, M.E.O.de Lopez - Bull.Am.Phys.Soc. 8, No.2, 125, U12 (1963).
Angular Distributions of the Ground and 1st-Excited States of ^{17}O Through the $^{16}O(d,p)$ Reactions at Different Deuteron Energies.
1963Ba08 S.Bashkin, V.P.Hart, W.A.Seale - Phys.Rev. 129, 1750 (1963).
Bombardment of C^{12} by Li^6 Ions.
1963Bu14 B.Budick, R.Marrus - Phys.Rev. 132, 723 (1963).
Hyperfine Structure and Nuclear Moments of Promethium-147 and Promethium-151.
1963Da12 E.A.Davis, T.W.Bonner, D.W.Worley, Jr., R.Bass - Nucl.Phys. 48, 169 (1963).
Disintegration of O^{16} and C^{12} by Fast Neutrons.
1963Fa03 W.M.Fairbairn - Nucl.Phys. 45, 437 (1963).
The Coulomb Energies of the Lower Excited Levels in the Light Mirror Nuclei.
1963Fu06 H.Fuchs - Z.Physik 171, 416 (1963).
Die Spektren der Photoneutronen aus O^{18} und N^{14}.
1963Gi04 J.Gilat, G.D.O′Kelley, E.Eichler - Bull.Am.Phys.Soc. 8, No.4, 320, GA11 (1963).
Spectroscopy of Delayed Neutrons: N^{17}.
1963Le03 J.C.Legg - Phys.Rev. 129, 272 (1963).
(p,d) and (p,t) Reactions on B^{11},C^{14},O^{16}, and O^{18}.
1963Lo03 J.Lowe, C.L.McClelland - Phys.Rev. 132, 367 (1963).
Lifetime Measurements on the First Excited States of O^{17} and F^{18}.
1963Pa01 G.M.Padawer, R.E.Benenson - Bull.Am.Phys.Soc. 8, No.1, 25, F5 (1963).
$N^{15}(He^3,p)O^{17}$ and $N^{15}(He^3,d)O^{16}$.
1963Pa03 S.P.Pandya - Nucl.Phys. 43, 636 (1963).
Effective Nuclear Interactions.
1963Ro12 J.R.Rook - Nucl.Phys. 41, 343 (1963).
Distorted Wave Analysis of Deuteron Induced Reactions in O^{18}.
1963Sm05 W.R.Smith, E.V.Ivash - Phys.Rev. 131, 304 (1963).
Distorted-Wave Calculations of Light Nuclei (d,p) Angular Distributions.
1963Sp02 R.H.Spear, J.D.Larson, J.D.Pearson - Nucl.Phys. 41, 353 (1963).
Excitation Function for the Reaction $C^{13}(\alpha,n\gamma)O^{16}$.
1963Un01 I.Unna - Phys.Rev. 132, 2225 (1963).
Use of Effective Interactions in the Analysis of Deformed Nuclei.
1963Ya03 K.Yagi, Y.Nakajima, K.Katori, Y.Awaya, M.Fujioka - Nucl.Phys. 41, 584 (1963).
Energy-Level Structure of O^{19}, O^{18}, and O^{17} Investigated by (d,p) Reactions with 15 MeV Deuterons.
1964Al11 T.K.Alexander, C.Broude, A.E.Litherland - Nucl. Phys. 53, 593 (1964).
The 3.06 and 3.85 MeV States in O^{17}.
1964Be15 J.A.Becker, D.H.Wilkinson - Phys. Rev. 134, B1200 (1964).
Electric Quadrupole Transitions Near A = 16: The Lifetimes of the First Excited States of O^{17} and F^{17}.
1964Ja08 M.F.Jahns, J.B.Nelson, E.M.Bernstein - Nucl.Phys. 59, 314(1964).
The $Al^{27}(d,\alpha)Mg^{25}$ and $F^{19}(d,\alpha)O^{17}$ Reactions and the 2I + 1 Rule.
1964Ki05 H.C.Kim, R.F.Seiler, D.F.Herring, K.W.Jones - Nucl.Phys. 57, 526 (1964).
Cross sections for the $O^{16}(d,p_0)O^{17}$, $O^{16}(d,p_1)O^{17*}$ and $O^{16}(d,\alpha_0)N^{14}$ reactions from 0.8 to 1.7 MeV.
1964Ma04 S.Mayo, J.Testoni, O.M.Bilaniuk - Phys.Rev. 133, B350 (1964).

REFERENCES FOR A=17(CONTINUED)

Some (d,α) Reactions on Be^9, F^{19}, and Al^{27} at 27.5 MeV.
1964Sc12 U.Schmidt-Rohr, R.Stock, P.Turek - Nucl.Phys. 53, 77 (1964).
Die Winkelverteilungen der Protonen Aus Den Reaktionen Be^9(d,p)Be^{10}, C^{12}(d,p)C^{13}, O^{16}(d,p)O^{17} und Ca^{40}(d,p)Ca^{41} bei 11.8 MeV.
1964Si06 M.G.Silbert, J.C.Hopkins - Phys.Rev. 134, B16 (1964).
Beta Decay of N^{17} to Bound States in O^{17}.
1964St25 J.R.Stehn, M.D.Goldberg, B.N.Magurno, R.Wiener-Chasman - BNL-325, 2nd Ed., Suppl.No.2, Vol.1 (1964).
Neutron Cross Sections, Z=1 to 20.
1965Al14 T.K.Alexander, K.W.Allen - Can.J.Phys. 43, 1563 (1965).
Lifetimes of the ^{16}O 6.13-MeV Level and the ^{17}O 0.871-MeV Level.
1965Ba32 B.K.Barnes, T.A.Belote, J.R.Risser - Phys.Rev. 140, B616 (1965).
Level Assignments in O^{17} from C^{13}(α,α)C^{13} and C^{13}(α,n)O^{16}.
1965Ba52 R.Batchelor, W.B.Gilboy, J.H.Towle - Nucl.Phys. 65, 236 (1965).
Neutron Interactions with U^{238} and Th^{232} in the Energy Region 1.6 MeV to 7 MeV.
1965BaZY B.K.Barnes - Thesis, Rice Univ. (1965).
States in O^{17} from C^{13} + α.
1965Co07 S.W.Cosper, B.T.Lucas, O.E.Johnson - Phys.Rev. 138, B51 (1965).
F^{19}(d,α)O^{17} Reaction at 9.2 MeV.
1965Co09 S.W.Cosper, O.E.Johnson - Phys.Rev. 138, B610 (1965).
Experimental Study of the 2I+1 Rule Using the (d,α) Reaction on F^{19}, Na^{23}, Al^{27}, and P^{31}.
1965Do13 I.Dostrovsky, R.Davis, Jr., A.M.Poskanzer, P.L.Reeder - Phys.Rev. 139, B1513 (1965).
Cross Sections for the Production of Li^9,C^{16}, and N^{17} in Irradiations With GeV-Energy Protons.
1965El01 A.Z.El-Behay, M.A.Farouk, M.H.Nassef, I.I.Zaloubovsky - Nucl.Phys. 61, 282 (1965).
The (d,α) Reaction on F^{19}.
1965Lo02 N.Longequeue, H.Beaumevieille, J.-P.Longequeue, M.Sandon, E.Ligeon - Compt.Rend. 260, 517 (1965).
Etude des Reactions $^{16}O(d,p_1)$ et $^{11}B(d,p_0)$ a Basse Energie (300 Kev).
1965Ma16 B.Margolis, N.De Takacsy - Phys.Letters 15, 329 (1965).
The Lowest Negative Parity State in F^{17} and O^{17}.
1965Ma59 N.A.Mansour, H.R.Saad, Z.A.Saleh, E.M.Sayed, I.I.Zaloubovsky, V.I.Gontchar - Nucl.Phys. 65, 433 (1965).
The (d,α) reaction on N^{15} and O^{16} in the deuteron energy range 1-2.5 MeV.
1965Mc10 R.E.McDonald, D.B.Fossan, L.F.Chase, Jr., J.A.Becker - Phys.Rev. 140, B1198 (1965).
O^{17} and O^{19} Lifetimes by a Particle-Gamma Coincidence Technique.
1965Mo16 R.Moreh, T.Daniels - Nucl.Phys. 74, 403(1965).
The Level Structure of ^{18}O and ^{19}O by Stripping Reactions.
1965Se01 K.K.Seth, G.Walter, P.D.Miller, J.A.Biggerstaff - Bull.Am.Phys.Soc. 10, No.1, 10, AC8 (1965).
$^{15}N(^3He,p)$ Reaction and Intermediate States.
1965St14 D.M.Stanojevic, S.D.Cirilov, M.M.Ninkovic - Nucl.Phys. 73, 657(1965).
The (d,α) Reactions on ^{19}F at Deuteron Energies of About 1 MeV.
1966Al09 J.L.Alty, L.L.Green, R.Huby, G.D.Jones, J.R.Mines, J.F.Sharpey-Schafer - Phys.Letters 20, 664 (1966).
Deuteron Optical Potentials and the $^{16}O(d,p)^{17}O$ Reaction.
1966Ar10 A.Armigliato, F.Brandolini, F.Pellegrini, E.Crescenti - Nuovo Cimento 45B, 92 (1966).
Shell-Model States of the Oxygen Isotopes.
1966Br04 G.E.Brown, A.M.Green - Nucl.Phys. 75, 401 (1966).
Even Parity States of ^{16}O and ^{17}O.
1966Ce03 M.Cevolani, S.Petralia, G.Di Caporiacco - Nucl.Phys. 79, 379(1966).
Energy and Angular Distributions of α-Particles in the $^{20}Ne(d,\alpha)^{17}O$ Reaction at 14 MeV.
1966De18 N.De Takacsy - Phys.Letters 23, 260 (1966).
Modification of the Effective Particle-Hole Force by Ground State Correlations in Perturbation Theory.
1966Ga09 A.Gallman, P.Fintz, P.E.Hodgson - Nucl.Phys. 82, 161(1966).
Reactions (d,p) sur ^{11}B, ^{12}C, ^{14}N et ^{16}O a $E < 5.5$ MeV.
1966He05 D.W.Heikkinen - Phys.Rev. 141, 1007 (1966); Erratum Phys.Rev. 149, 990 (1966).
Total Cross Sections and Angular Distributions of the $C^{12}(Li^6,P)O^{17}$, $C^{12}(Li^6,D)O^{16}$, and $C^{12}(Li^6,\alpha)N^{14}$ Reactions from 4.5 to 5.5 MeV.
1966Li03 D.Lister, A.Sayres - Phys.Rev. 143, 745 (1966).
Elastic Scattering of Neutrons from Carbon and Oxygen in the Energy Range 3.0 to 4.7 MeV.
1966Ma12 B.Margolis, N.De Takacsy - Can.J.Phys. 44, 1431 (1966).
Low-Lying Negative Parity States in the A = 17 Nuclei.
1966Mc01 W.J.McDonald, J.M.Robson, R.Malcolm - Nucl.Phys. 75, 353(1966).
Scattered Neutrons and Gamma Rays from the $^{16}O(n,n'\gamma)^{16}O$ Reaction at E = 14.1 MeV.
1966Mc11 L.D.McIsaac, R.G.Helmer - Phys.Rev. 150, 1033 (1966).
Levels in ^{149}Sm from the Decay of ^{149}Eu and ^{149}Pm.

REFERENCES FOR A=17(CONTINUED)

1966Mc14 W.N.McDicken, W.Jack - Nucl.Phys. 88, 457(1966).
The Reactions $^{20}Ne(n,\alpha)^{17}O$ and $^{16}O(n,\alpha)^{13}C$ Using 14 MeVNeutrons.

1966Ri04 E.Rivet, R.H.Pehl, J.Cerny, B.G.Harvey - Phys.Rev. 141, 1021 (1966).
Investigation of High Spin Levels Preferentially Populated by the (α,d) Reaction.

1966Sc09 J.P.Schiffer, L.L.Lee, Jr., A.Marinov, C.Mayer-Boricke - Phys.Rev. 147, 829 (1966).
Dependence of the Angular Distribution of the (d,p) Reaction on the Total Angular-Momentum Transfer. II.

1966Ti03 Y.I.Titov, A.P.Klyucharev, V.D.Vypirailenko - Yadern.Fiz. 4, 308 (1966); Soviet J.Nucl.Phys. 4, 221 (1967).
The Reaction $N^{15}(d,\alpha_0)C^{13}$ with 0.81-1.8 MeV Deuterons.

1966We04 J.J.Wesolowski, L.F.Hansen, J.G.Vidal, M.L.Stelts - Phys.Rev. 148, 1063 (1966).
Two-Nucleon Distorted-Wave Born Approximation Analysis of $F^{19}(d,\alpha)O^{17}$ Data.

1966Wi01 H.H.Williams, E.K.Warburton, K.W.Jones, J.W.Olness - Phys.Rev. 144, 801 (1966).
Excitation Energies of Bound States of O^{17} and B^{12}.

1967Al06 J.L.Alty, L.L.Green, R.Huby, G.D.Jones, J.R.Mines, J.F.Sharpey-Schafer - Nucl.Phys. A97, 541(1967).
A Study of the $^{16}O(d,p)^{17}O$ Reaction.

1967Be30 T.Becker, K.Bahr, R.Jahr, W.Kuhlmann - Phys.Letters 24B, 458 (1967).
Sequential Decay in the Reaction $^{14}N(\alpha,\alpha p)^{13}C(0)$ at E = 22.9 MeV.

1967Bi05 P.G.Bizzeti, A.M.Bizzeti-Sona, S.Kalbitzer, B.Povh - Z.Physik 201, 295 (1967).
Measurement of the Lifetime of the First Excited State of ^{17}O and ^{17}F.

1967Co05 R.K.Cole, R.Dittman, H.S.Sandhu, C.N.Waddell, J.K.Dickens - Nucl.Phys. A91, 665(1967).
The $^{19}F(p,\alpha)^{16}O$ and $^{19}F(p,^3He)^{17}O$ Reactions at 30.5 MeV.

1967Dz01 T.G.Dzubay - Phys.Rev. 158, 977 (1967).
Study of Cross-Section Fluctuations for Li^6+C^{12} Reactions.

1967Go04 A.Goswami, A.I.Sherwood - Nucl.Phys. A91, 64 (1967).
Theory of Non-Normal Parity States of Doubly Closed Shell Plus One-Nucleon Systems.

1967Jo12 C.H.Johnson, J.L.Fowler - Phys.Rev. 162, 890 (1967).
Scattering of Neutrons from ^{16}O in the 2.2- to 4.2-MeV Energy Range.

1967Lu05 H.F.Lutz, J.J.Wesolowski, S.F.Eccles, L.F.Hansen - Nucl.Phys. A101, 241(1967).
Study of the $^{18}O(p,t)^{16}O$ and $^{18}O(p,d)^{17}O$ Reactions at E =18.2 MeV.

1967Sc16 H.Schulz, H.J.Wiebicke, R.Reif - Nucl.Phys. A101, 577 (1967).
Single-Particle States in Non-Local Potentials and Direct Nuclear Reactions.

1967Se07 K.K.Sekharan, A.S.Divatia, M.K.Mehta, S.S.Kerekatte, K.B.Nambiar - Phys.Rev. 156, 1187 (1967).
$^{13}C(\alpha,n)^{16}O$ Reaction Cross Section Between 1.95 and 5.57 MeV.

1968Bi07 J.Birkholz, F.Beck - Phys.Letters 28B, 18 (1968).
Particle-Core Coupling in ^{17}O.

1968Bi09 M.Bister, A.Fontell, P.Vikberg - Ann.Acad.Sci.Fennicae, Ser.A VI, No.268 (1968).
A Study of Deuteron-Induced Reactions in Fluorine at Bombarding Energies of 2.0 and 2.2 MeV.

1968Da05 C.N.Davids - Nucl.Phys. A110, 619(1968).
A Study of (α,n) Reactions on ^9Be and ^{13}C at Low Energies.

1968Di06 O.Dietzsch, R.A.Douglas, E.F.Pessoa, V.G.Porto, E.W.Hamburger, T.Polga, O.Sala, S.M.Perez, P.E.Hodgson - Nucl.Phys. A114, 330(1968).
Deuteron-Induced Reactions on ^{16}O.

1968Ha30 L.F.Hansen, M.L.Stelts, J.G.Vidal, J.J.Wesolowski, V.A.Madsen - Phys.Rev. 174, 1155 (1968).
Study of the Two-Body Force Through the (He^3,t) Charge-Exchange Reaction on O^{17} and O^{18}.

1968Ho23 K.Hosono - J.Phys.Soc.Japan 25, 36(1968).
j-Forbidden (d,p) Stripping Reactions on C^{12}, O^{16} and Mg^{24}.

1968Ke02 G.W.Kerr, J.M.Morris, J.R.Risser - Nucl.Phys. A110, 637(1968).
Energy Levels of ^{17}O from $^{13}C(\alpha,\alpha_0)^{13}C$ and $^{13}C(\alpha,n)^{16}O$.

1968Le11 B.Leroux, K.El-Hammami, J.Dalmas, R.Chastel, G.Lamot, C.Fayard, J.Hajj Boutros - Nucl.Phys. A116, 196(1968).
Etude des Reactions (n,α) sur les Noyaux ^{16}O et ^{14}N a 14.9 MeV.

1968LuZY C.C.Lu - Thesis, Univ.California (1968); Diss.Abst.Int. 30B, 1029 (1968).
The (α,d) Reaction on Light and Medium Mass Nuclides.

1968LuZZ C.C.Lu - Thesis, Univ.California (1968); UCRL-18470 (1968).
The (α,d) Reaction on Light and Medium Mass Nuclides.

1968Me10 K.Meier-Ewert, K.Bethge, K.-O.Pfeiffer - Nucl.Phys. A110, 142(1968).
^6Li Induced Reactions on ^{12}C at E(lab) = 20 MeV.

1968Mi05 P.F.Mizera, J.B.Gerhart - Phys.Rev. 170, 839 (1968).
(α,Li) Reactions on B^{11}, N^{15}, and F^{19}.

1968Na06 I.M.Naqib, L.L.Green - Nucl.Phys. A112, 76(1968).
Absolute Cross Sections of the $^{16}O(d,p)^{17}O$ Reactions and Spectroscopic Factors of States in ^{17}O.

1968Pe16 A.K.Petrauskas, V.V.Vanagas - Yadern.Fiz. 8, 463 (1968); Soviet J.Nucl.Phys. 8, 270 (1969).
Magnetic-Dipole Moments of Nuclei in the Approximation of Wigner Supermultiplets.

REFERENCES FOR A=17(CONTINUED)

1968Pr04 J.R.Priest, J.S.Vincent - Phys.Rev. 167, 933 (1968).
Interpretation of the (d,α) Reactions on F^{19} and N^{15} at 20.9 MeV.

1968Re07 D.Rendic, B.Antolkovic, G.Paic, M.Turk, P.Tomas - Nucl.Phys. A117, 113(1968).
14.4 MeV Neutron-Induced Reactions on ^{19}F.

1968Sc18 H.F.Schaefer III, R.A.Klemm, F.E.Harris - Phys.Rev. 176, 49 (1968).
Atomic Hyperfine Structure. I. Polarization Wave Functions for the Ground States of B, C, N, O, and F.

1968Ta02 Y.Takeuchi, Y.Hiratate, K.Miura, T.Tohei, S.Morita - Nucl.Phys. A109, 105(1968).
The 2I+1 Rule and the Reaction Mechanism of the $^{19}F(d,\alpha)^{17}O$ Reaction.

1968Za03 I.I.Zalyubovskii, A.P.Lobkovskii, O.F.Nemets, A.Z.Melenevskii - Yadern.Fiz. 8, 663 (1968); Soviet J.Nucl.Phys. 8, 384 (1969).
Investigation of the $F^{19}(d,\alpha)$ Reaction in the Energy Range 2.4-3.95 MeV.

1969AjZZ V.Ajadcic, N.Cindro, M.Jurcevic, M.L.Chatterjee - Proc.Nucl.Phys.and Solid State Symp., Roorkee, Vol.II, p.20 (1969).
A low background telescopic system with a Si-detector, suitable for (n, l) studies in the negative Q-value region.

1969Ba17 K.Bahr, T.Becker, R.Jahr, W.R.Kuhlmann - Nucl.Phys. A129, 388 (1969).
Sequential Decay in the Reactions $^{14}N(\alpha,\alpha p)^{13}C$ and $^{14}N(\alpha,\alpha d)^{12}C$ at E=22.9 MeV.

1969BaZN CONF Heidelberg,P152.

1969Bo37 J.Bobker - Phys.Rev. 185, 1294 (1969).
Configuration Mixing of Major Shells in Mass-16 and Mass-17 Nuclei.

1969Bu08 E.M.Burymov - Yadern.Fiz. 9, 933 (1969); Soviet J.Nucl.Phys. 9, 546 (1969).
Cross Sections for Excitation of O^{16}, Al^{27}, Cr^{52}, and $Zn^{64,66,68}$ Levels by 14.6-MeV Neutrons.

1969Co12 H.Cords, G.U.Din, B.A.Robson - Nucl.Phys. A134, 561 (1969).
Tensor Polarization and Reactions of Deuterons on ^{16}O at Bombarding Energies of 4.4 to 8.4 MeV.

1969Da13 J.C.Davis, F.T.Noda - Nucl.Phys. A134, 361 (1969).
Neutron Energy Determinations.

1969De06 C.Detraz, H.H.Duhm - Phys.Letters 29B, 29 (1969).
A Study of the T = 3/2 States of ^{17}O.

1969De16 J.Dey, J.P.Elliott, A.D.Jackson, H.A.Mavromatis, E.A.Sanderson, B.Singh - Nucl.Phys. A134, 385 (1969).
First-Order Binding Energies and Spectra with a Potential Matrix Deduced from Phase Shifts.

1969Du11 P.D.Dumont, M.Huez - Bull.Soc.Roy.Sci.Liege 38, 516 (1969).
Reactions $^{16}O(d,p_1)^{17}O^*$ et $^{16}O(d,p_0)^{17}O$ Mesure de la Fonction d′Excitation entre E = 350 and 1050 keV Distributions Angulaires.

1969Fu11 G.H.Fuller, V.W.Cohen - Nucl.Data Tables A5, 433 (1969).
Nuclear Spins and Moments.

1969Ga05 A.Gallmann, F.Jundt, E.Aslanides, D.E.Alburger - Phys.Rev. 179, 921 (1969).
Beta Decays of C^{15}, F^{17}, and F^{20}.

1969Go04 S.Gorodetzky, J.C.Merdinger, N.Schulz, A.Knipper - Nucl.Phys. A129, 129 (1969).
Durees de Vie dans ^{17}O, ^{39}K et ^{45}Ca par Une Technique de Coincidences Particule-Gamma.

1969Go12 W.A.Goddard III - Phys.Rev. 182, 48 (1969).
Core Polarization and Hyperfine Structure of the B,C,N,O, and F Atoms.

1969Ic02 M.Ichimura, M.Kawai, T.Ohmura, B.Imanishi - Phys.Letters 30B, 143 (1969).
A Numerical Study on the Validity of DWBA for (d,p) Reactions.

1969Ke07 H.P.Kelly - Phys.Rev. 180, 55 (1969).
Hyperfine Structure of Oxygen Calculated by Many-Body Theory. II.

1969Li22 Y.-C.Liu, W.-S.Hou, C.Chang - Chin.J.Phys. 7, 63 (1969).
The $F^{19}(d,\alpha)O^{17}$ Reaction and the 2I + 1 Rule.

1969Lu07 C.C.Lu, M.S.Zisman, B.G.Harvey - Phys.Rev. 186, 1086 (1969).
High-Spin States of Configuration $(1d_{5/2})^2(5^+,0)$ and $(1g_{9/2})^2(9^+,0)$ Strongly Populated by the (α,d) Reaction.

1969Ma38 H.A.Mavromatis, B.Singh - Nucl.Phys. A139, 451 (1969).
Calculation of the Quadrupole Moments and B(E2) Values of ^{17}O and ^{17}F with the Sussex Matrix Elements.

1969Me07 L.Mesko, B.Schlenk, G.Somogyi, A.Valek - Nucl.Phys. A130, 449 (1969).
$^{19}F(d,\alpha)^{17}O$ Angular Distributions at E = 300-650 keV.

1969Me15 D.Meier, M.Brullmann, H.Jung, P.Marmier - Helv.Phys.Acta 42, 813 (1969).
Elastische und Inelastische Streuung von 14,1-MeV-Neutronen an ^{16}Ound ^{18}O.

1969Ni09 R.J.Nickles - Nucl.Phys. A134, 308 (1969).
Some Lifetimes in the A=15-25 Mass Range.

1969No03 J.A.Nolen, Jr., J.P.Schiffer - Phys.Letters 29B, 396 (1969).
Coulomb Energies – An Anomaly in Nuclear Matter Radii.

1969Ro07 F.A.Rose - Nucl.Phys. A124, 305(1969).
Differential Cross Sections for the $^{14}N(\alpha,p)^{17}O^*$ Reaction.

1969Sc04 H.Scholermann - Z.Physik 220, 211(1969).
Die Polarisation der Neutronen Aus der Reaktion $^{13}C(\alpha,n)^{16}O$.

1969Sc21 W.A.Schier, J.D.Reber - Phys.Rev. 181, 1371 (1969).

REFERENCES FOR A=17(CONTINUED)

Isobaric-Spin Impurities of ^{18}F States from $^{14}N(\alpha,n)^{17}F(0.500)/^{14}N(\alpha,p)^{17}O(0.871)$ Cross-Section Ratios.
1969Sc33 H.F.Schaefer,III, R.A.Klemm - Phys.Rev. 188, 152 (1969).
Atomic Hyperfine Structure. III. Excited States of C, N, and O.
1969Sc34 H.F.Schaefer,III, R.A.Klemm, F.E.Harris - Phys.Rev. 181, 137 (1969).
Atomic Hyperfine Structure. II. First-Order Wave Functions for the Ground States of B, C, N, O, and F.
1969Sp02 A.V.Spasskii, K.G.Tarov, I.B.Teplov, L.N.Fateeva - Yadern.Fiz. 9, 936 (1969); Soviet J.Nucl.Phys. 9, 548 (1969).
The Reaction $B^{11}(\alpha,p_0)C^{14}$.
1969Th04 S.T.Thornton - Nucl.Phys. A137, 531 (1969).
The $^{16}O(d,n)^{17}F$ Reaction at E=8.0 and 9.3 MeV.
1969Ul03 N.Ullah, S.S.M.Wong - Phys.Rev. 188, 1645 (1969).
Mixed-Parity Hartree-Fock Calculations for Light Nuclei Using Realistic Forces.
1969Wo09 V.K.Wohlleben, E.Schuster - Radiochim.Acta 12, 75 (1969).
Aktivierungsanalyse mit Deuteronen. Der Totale Wirkungsquerschnitt der Reaktionen $^{10}B(d,n)^{11}C$, $^{14}N(d,n)^{15}O$ und $^{16}O(d,n)^{17}F$ bis 3,2 MeV.
1970Aj03 V.Ajdacic, M.L.Chatterjee, N.Cindro, M.Jurcevic - Nucl.Instrum.Methods 79, 77 (1970).
A Low Background Telescopic System for the Study of (n,α) Reactions.
1970Ba10 S.A.Bakiev, V.O.Kordyukevich, L.N.Kryukova, V.V.Muraveva, A.A.Sorokin - Izv.Akad.Nauk SSSR, Ser.Fiz. 34, 59 (1970); Bull.Acad.Sci.USSR, Phys.Ser. 34, 58 (1971).
Radioactive Decay of Neutron-Deficient Isotopes of Pt, Ir, and Os.
1970Ba49 P.H.Barker, A.Huber, H.Knoth, U.Matter, A.Gobbi, P.Marmier - Nucl.Phys. A155, 401 (1970).
One-Neutron Transfer Reactions with Beryllium, Carbon and Oxygen Nuclei.
1970Ba55 P.H.Barker, P.M.Cockburn, H.P.Seiler, P.Marmier - Phys.Rev.Lett. 25, 1350 (1970).
One-Neutron Transfer Reactions $^{9}Be(^{16}O,^{17}O[0.871])^{8}Be$ and $^{13}C(^{16}O,^{17}O[0.871])^{12}C$.
1970Be21 G.Bertsch, A.Molinari - Nucl.Phys. A148, 87 (1970).
Correlation Effect on Unique Forbidden Decays.
1970Be31 K.Bethge, D.J.Pullen, R.Middleton - Phys.Rev. C2, 395 (1970).
Level Structure of ^{17}O and the $^{13}C(^{6}Li,d)$ and $^{13}C(^{7}Li,t)$ Reactions.
1970Bo25 W.Bohne, H.Homeyer, H.Lettau, H.Morgenstern, J.Scheer - Nucl.Phys. A156, 93 (1970).
Optical-Model Analysis of Elastic tau Scattering on the Nuclei with A= 15-18 at 11 MeV.
1970Bo30 F.Boreli - Fizika 2, 97 (1970).
Neutron Total Elastic Scattering Cross Section Measurement on ^{16}O.
1970Br17 M.Brendle, M.Morike, G.Staudt, G.Steidle - Nucl.Instrum.Methods 81, 141 (1970).
A Counter Telescope to Investigate (n,α) Reactions.
1970Bu16 V.E.Bunakov, K.A.Gridnev, L.V.Krasnov - Phys.Lett. 32B, 587 (1970).
DWBA Calculations for Stripping to Resonances.
1970Da14 N.E.Davison, W.K.Dawson, G.Roy, W.J.McDonald - Can.J.Phys. 48, 2235 (1970).
Reaction Mechanism of the $^{16}O + d$ Reactions.
1970Do10 J.Dobes - Nucl.Phys. A157, 661 (1970).
An Absorption Model for Direct Transfer Reactions.
1970Du07 J.L.Duggan, J.Y.Park, S.D.Danielopoulos, P.D.Miller, J.Lin, M.M.Duncan, R.L.Dangle - Nucl.Phys. A151, 107 (1970).
^{3}He Elastic Scattering from ^{10}B and ^{14}C in the Range 4 to 18MeV.
1970Fo03 J.L.Fowler, C.H.Johnson - Phys.Rev. C2, 124 (1970).
Differential Scattering of Neutrons at Narrow Levels in ^{17}O.
1970Go29 V.Z.Goldberg, V.V.Davydov, A.A.Ogloblin, S.B.Sakuta, V.I.Chuev - Yad.Fiz. 12, 30 (1970); Sov.J.Nucl.Phys. 12, 16 (1971).
Excitation of the States (4p-3h) in the Reactions $C^{13}(Li^{6},d)O^{17}$ and $C^{13}(Li^{7},t)O^{17}$.
1970Hi15 M.Hirata - Progr.Theoret.Phys. 43, 1526 (1970).
Study of Core Excited States in ^{17}O.
1970Ho08 J.L.Honsaker, T.H.Hsu, W.J.McDonald, G.C.Neilson - Nucl.Phys. A144, 473 (1970).
A Double-Stripping Study of ^{16}O Structure.
1970Jo09 D.J.Johnson, M.A.Waggoner - Phys.Rev. C2, 41 (1970).
Study of $Li^{6} + C^{12}$ Reactions.
1970KeZY THESIS Univ Florida,R M Keyser,DABBB 32B 1773,10/18/71.
1970Ki15 K.King, B.H.J.McKellar - Aust.J.Phys. 23, 453 (1970).
Calculations for Stripping on Double Magic Nuclei.
1970LeZT REPT NP-18628, M-C Lemaire, 7/2/71.
1970Lu16 B.Lundberg, L.G.Stromberg, H.Conde - Phys.Scr. 2, 273 (1970).
Gamma Rays from Inelastic Neutron Scattering in Oxygen.
1970Mc02 A.B.McDonald, E.G.Adelberger, H.B.Mak, D.Ashery, A.P.Shukla, C.L.Cocke, C.N.Davids - Phys.Lett. 31B, 119 (1970).
Isospin-Nonconserving Particle Decays of the Lowest $T = 3/2$ Levels in ^{17}F and ^{17}O.
1970Me31 H.O.Menlove, R.H.Augustson, C.N.Henry - Nucl.Sci.Eng. 40, 136 (1970).
Cross Section for the Delayed-Neutron Yield from the $^{17}O(n,p)^{17}N$ Reaction at 14.1 MeV.

REFERENCES FOR A=17(CONTINUED)

1970Oh06 T.Ohmura, B.Imanishi, M.Ichimura, M.Kawai - Progr.Theoret.Phys. 43, 347 (1970).
Study of Deuteron Stripping Reaction by Coupled Channel Theory. II. Properties of Interaction Kernel and Method of Numerical Solution.

1970Pe14 C.A.Pearson, D.Zissermann, J.M.Covan - Nucl.Phys. A152, 449 (1970).
A Study of the Reactions $^{16}O(d,p)^{17}O$ and $^{90}Zr(d,p)^{91}Zr$ Using the WBP Model.

1970Ro08 A.D.Robb, W.A.Schier, E.Sheldon - Nucl.Phys. A147, 423 (1970).
Spin and Parity Assignments for ^{17}O Levels from the $^{13}C(\alpha,n)^{16}O(g.s.)$ Reaction.

1970Ry02 V.F.Rybachenko, A.A.Sadovoi - Yad.Fiz. 11, 1192 (1970); Sov.J.Nucl.Phys. 11, 663 (1970).
Concerning the Calculation of the Spectrum of the Lower Positive-Parity Levels of O^{17}.

1970Si02 R.P.Singhal, J.R.Moreira, H.S.Caplan - Phys.Rev.Lett. 24, 73 (1970).
RMS Charge Radii of $^{16,17,18}O$ by Elastic Electron Scattering.

1970So12 G.Somogyi, B.Schlenk - Radiat.Eff. 5, 61 (1970).
The Application of Solid-State Track Detectors for Measuring Alpha-Particle Angular Distributions in Nuclear Reactions.

1970Vi03 C.M.Vincent, H.T.Fortune - Phys.Rev. C2, 782 (1970).
New Method for Distorted-Wave Analysis of Stripping to Unbound States.

1970Wa01 G.E.Walker, D.Schlobohm - Nucl.Phys. A140, 49 (1970).
Matrix Elements of Many-Particle-Many-Hole States with an Applicationto Isospin Mixing in the Mass-17 System.

1970Ze01 N.S.Zelenskaya, N.V.Karabanov, A.V.Spassky, K.G.Tarov, I.B.Teplov, L.N.Fateeva - Yad.Fiz. 11, 722 (1970); Sov.J.Nucl.Phys. 11, 405 (1970).
Mechanism of the Reaction $N^{14}(\alpha,p)O^{17}$ and Structure of the Lower States of the Nucleus O^{17}.

1971Aj02 F.Ajzenberg-Selove - Nucl.Phys. A166, 1 (1971).
Energy Levels of Light Nuclei with A = 16-17.

1971Al09 B.J.Allen, R.L.Macklin - Phys.Rev. C3, 1737 (1971).
Neutron Capture Cross Sections of ^{13}C and ^{16}O.

1971Au08 N.Auerbach - Phys.Lett. 36B, 293 (1971).
The Isovector Monopole State and Coulomb Displacement Energies.

1971Ba06 W.L.Baker, C.E.Busch, J.A.Keane, T.R.Donoghue - Phys.Rev. C3, 494 (1971).
Investigation of States in ^{17}O via Neutron-Polarization Measurements in the $^{13}C(\alpha,n)^{16}O$ Reaction.

1971Ba68 P.H.Barker, P.M.Cockburn, A.Huber, H.Knoth, U.Matter, H.-P.Seiler, P.Marmier - Ann.Phys.(N.Y.) 66, 705 (1971).
Transfer Reactions below the Coulomb Barrier.

1971Ba82 R.Bachinger, M.Uhl - Acta Phys.Austr. 33, 317 (1971).
Energie und Winkelverteilung der Alphateilchen nach der Reaktion $^{20}Ne(n,\alpha)^{17}O$ bei einer Neutronenenergie von 14.1 +/- 0.1 MeV.

1971Bo50 I.Borbely - Phys.Lett. 37B, 243 (1971).
Comparison of Spectroscopic Information Given by the Peripheral Modeland DWBA.

1971Br44 R.C.Brown, A.A.Debenham, G.W.Greenlees, J.A.R.Griffith, O.Karban, D.C.Kocher, S.Roman - Phys.Rev.Lett. 27, 1446 (1971).
Small-Angle Tensor Analyzing Power of (d,p) Reactions and Deuteron D-State Effects.

1971Co14 W.R.Coker, P.D.Miller, J.L.Duggan, M.M.Duncan, R.L.Dangle, J.Lin - Nucl.Phys. A168, 307 (1971).
The $^{14}C(t,\alpha_0)^{13}C$ Reaction at 6.0, 8.0 and 10.0 MeV.

1971Do13 D.J.Donahue, R.L.Hershberger - Phys.Rev. C4, 1693 (1971).
Doppler Shifts with Gas Backings; Mean Lives in ^{17}O, ^{25}Mg, and ^{55}Fe.

1971Do15 C.B.Dover, N.Van Giai - Nucl.Phys. A177, 559 (1971).
Low-Energy Neutron Scattering by a Hartree-Fock Field.

1971Hs02 S.T.Hsieh, T.Y.Lee, C.T.Chen-Tsai - Phys.Rev. C4, 105 (1971).
Effective Interactions between Inequivalent Nucleons in the 1p and 2s,1d Shells.

1971Ka18 S.Kardonsky, H.L.Finston, E.T.Williams - Phys.Rev. C4, 846 (1971).
Reactions of ^{20}Ne with 14.3-MeV Neutrons.

1971Ka40 N.Kassis, H.A.Mavromatis, B.Singh - Phys.Lett. 37B, 15 (1971).
A Third-Order Calculation of the ^{16}O Binding Energy and of the Single-Particle Energies of ^{17}O.

1971Ke08 R.M.Keyser, R.A.Blue, H.R.Weller - Phys.Lett. 34B, 602 (1971).
The 21.7 and 22.1 MeV States in ^{17}O.

1971Ko21 D.C.Kocher, P.J.Bjorkholm, W.Haeberli - Nucl.Phys. A172, 663 (1971).
The Reactions $^{16}O(d,p)^{17}O$ and $^{28}Si(d,p)^{29}Si$ Initiated by Vector-Polarized Deuterons.

1971Mu23 A.Muller-Arnke - Z.Phys. 247, 408 (1971).
Calculation of Negative Parity States in ^{17}O.

1971Ni04 R.J.Nickles, P.L.Jolivette, G.M.Klody - Izv.Akad.Nauk SSSR, Ser.Fiz. 35, 65 (1971); Bull.Acad.Sci.USSR, Phys.Ser. 35, 60 (1972).
Oxygen-Beryllium Neutron Tunnelling below the Coulomb Barrier.

1971Sc21 H.Schmidt-Bocking, G.Brommundt, K.Bethge - Z.Phys. 246, 431 (1971).
Investigation of the Level Structure of ^{17}O.

1971SeZZ JOUR BAPSA 16 490.

1971Te10 I.B.Teplov - Izv.Akad.Nauk SSSR, Ser.Fiz. 35, 154 (1971); Bull.Acad.Sci.USSR, Phys.Ser. 35, 140 (1972).

REFERENCES FOR A=17(CONTINUED)

Some Features of Heavy-Particle Stripping.

1971To08 I.S.Towner, E.K.Warburton, G.T.Garvey - Ann.Phys.(N.Y.) 66, 674 (1971).
Hindrance Phenomena in Unique First- and Third-Forbidden β-Decay.

1971We08 G.D.Westin, J.L.Adams - Phys.Rev. C4, 363 (1971).
Potential Scattering and Spectroscopic Factors in R-Matrix Theory.

1972Ad03 R.J.Adler - Phys.Rev. C5, 615 (1972).
Radiative np Capture and Polarization Effects.

1972Al42 D.E.Alburger, D.H.Wilkinson - Phys.Rev. C6, 2019 (1972).
Half-Lives of ^{17}N and ^{17}F.

1972Be22 A.M.Bernstein - Ann.Phys.(New York) 69, 19 (1972).
A Qualitative Description of the Spectra ^{17}O and ^{41}Ca.

1972BiZM JOUR BAPSA 17 921,H Bingham,11/2/72.

1972Bo52 G.C.Bonazzola, T.Bressani, E.Chiavassa, L.Naldi - Lett.Nuovo Cim. 5, 226 (1972).
Backward Scattering of 14.1 MeV Neutrons from ^{16}O.

1972Br12 R.C.Brown, I.Govil, J.A.R.Griffith, G.Hudson, O.Karban, S.Roman - Nucl.Phys. A185, 49 (1972).
Vector Analysing Power of (d,p) Reactions on ^{16}O and ^{24}Mg at 12MeV.

1972Br50 H.J.Brede - Z.Phys. 254, 364 (1972).
Ein Plattenzahlerteleskop zur Untersuchung von (n,α)-Reaktionen.

1972Bu23 V.E.Bunakov, K.A.Gridnev, L.V.Krasnov - Yad.Fiz. 15, 906 (1972); Sov.J.Nucl.Phys. 15, 508 (1972).
Verification of Distorted Wave Method for Stripping Reactions to Resonant State.

1972CaYU JOUR BAPSA 17 915, J Calarco,10/30/72.

1972Co15 K.W.Corrigan, R.M.Prior, S.E.Darden - Nucl.Phys. A188, 164 (1972).
Study of $^{16}O(d,d)^{16}O$ and $^{16}O(d,p)^{17}O$ Using Polarized Deuterons.

1972CoZE THESIS Univ Maryland,M D Cooper,DABBB 33B 373,8/21/72.

1972Dz06 P.O.Dzhamalov, E.I.Dolinskii, A.M.Mukhamedzhanov - Yad.Fiz. 15, 258 (1972); Sov.J.Nucl.Phys. 15, 147 (1972).
Peripheral Model for a Stripping Reaction to a Resonant State.

1972En03 T.Engeland, P.J.Ellis - Nucl.Phys. A181, 368 (1972).
The Weak Coupling Model Applied to the Nuclei with A = 16-19. (II). Gamma Transitions and Spectroscopic Factors.

1972Gl06 D.Glas - Z.Phys. 255, 175 (1972).
Einfluss einer Quasiteilchen-Spinbahnwechselwirkung auf die magnetischen Momente leichter Atomkerne.

1972Go04 L.J.B.Goldfarb, K.Takeuchi - Nucl.Phys. A181, 609 (1972).
Effects of Non-Orthogonality and Virtual Excitations in Direct Reactions (I).

1972HuZR THESIS Univ Southern Calif,K A Huber,DABBB 32B 7237,7/12/72.

1972JoZV REPT ORNL-4743,P37,6/7/72.

1972Ke08 R.M.Keyser, R.A.Blue, H.R.Weller - Nucl.Phys. A186, 528 (1972).
A Study of ^{17}O via ^{3}He Bombardment of ^{14}C.

1972Ki12 M.V.Kirichenko, Z.I.Soloveva - Yad.Fiz. 16, 17 (1972); Sov.J.Nucl.Phys. 16, 9 (1973).
An Investigation of the (n,α) Reaction between 4.9-MeV Neutrons and Light Nuclei of a Photographic Emulsion.

1972Ku19 B.I.Kuznetsov, P.E.Ovsyannikova, I.P.Chernov - Yad.Fiz. 15, 673 (1972); Sov.J.Nucl.Phys. 15, 377 (1972).
Elastic Scattering of 26.6 MeV α-Particles by Light Nuclei.

1972La18 S.Laribi, H.Beaumevieille, N.Bendjaballah, D.Lalanne, J.F.Allard, B.Faid - Nucl.Phys. A191, 368 (1972).
Etude des Reactions $^{19}F(d,\alpha)$, $^{19}F(d,p)$ a E = 3 MeV et Etats Excites du ^{20}F.

1972Le01 M.-C.Lemaire, M.C.Mermaz, K.K.Seth - Phys.Rev. C5, 328 (1972).
Study of the 2p-1h Structure of ^{17}O via the $^{15}N(^{3}He,p)$ Reaction.

1972Le27 G.M.Lerner, E.F.Redish - Nucl.Phys. A193, 565 (1972).
Optical-Model Calculations with a Realistic Nucleon-Nucleon Interaction (I). Theory.

1972Le28 G.M.Lerner, J.B.Marion - Nucl.Phys. A193, 593 (1972).
Optical-Model Calculations with a Realistic Nucleon-Nucleon Interaction (II). Elastic Scattering of Protons by Oxygen Isotopes.

1972Li30 S.-Y.Lin, Y.-C.Hsu, M.-C.Chou, C.-Y.Huang, J.-L.Hwang, Y.-C.Hsu - Chin.J.Phys.(Taiwan) 10, 69 (1972).
$^{20}Ne(n,\alpha)^{17}O$ Reaction Induced by 14.1 MeV Neutrons.

1972Ma52 P.O.Martinsen, J.Randrup - Nucl.Phys. A195, 26 (1972).
Shell-Model Calculation of the β^{+} Strength from ^{115}Xe.

1972Pa29 A.D.Panagiotou, H.E.Gove - Nucl.Phys. A196, 145 (1972).
A Study of the $^{16}O(^{6}Li,t)^{19}Ne$ Reaction.

1972Ph06 R.J.Philpott - Phys.Rev. C5, 1457 (1972).
Nucleon-Transfer Form Factors Relative to a Microscopically SpecifiedCore.

1972Sc20 B.Schwesinger, W.Stocker - Phys.Lett. 39B, 475 (1972).
A DWBA Model Calculation for Stripping to Unbound States.

1972Sc45 L.Schlessinger, G.L.Payne - Phys.Rev. C6, 2047 (1972).
Stripping Calculations for Unbound States.

1972Sh17 M.A.Sharaf - Z.Phys. 253, 28 (1972).

REFERENCES FOR A=17(CONTINUED)

Transfer Reactions to Unbound States by the Diffraction Model.

1972Sl10 R.P.Slabospitskii, V.I.Borovlev, Y.G.Mashkarov, A.S.Deineko - Izv.Akad.Nauk SSSR, Ser.Fiz. 36, 2225 (1972); Bull.Acad.Sci.USSR, Phys.Ser. 36, 1950 (1973).
Interaction of Polarized Deuterons with ^{16}O Nuclei.

1972To03 I.S.Towner, J.C.Hardy - Nucl.Phys. A179, 489 (1972).
First-Forbidden Non-Unique β-Transitions and Mirror Comparisons in Light Nuclei.

1972VeZY JOUR BAPSA 17 113,E Ventura,1/17/72.

1973Ad02 E.G.Adelberger, A.B.McDonald, C.L.Cocke, C.N.Davids, A.P.Shukla, H.B.Mak, D.Ashery - Phys.Rev. C7, 889 (1973).
Isospin-Forbidden Particle Decay of T = 3/2 Levels in Mirror Nuclei.

1973Ba10 J.K.Bair, F.X.Haas - Phys.Rev. C7, 1356 (1973).
Total Neutron Yield from the Reactions $^{13}C(\alpha,n)^{16}O$ and $^{17,18}O(\alpha,n)^{20,21}Ne$.

1973Ba51 G.Baur, D.Trautmann - Nucl.Phys. A211, 333 (1973).
Neutron Transfer to Unbound States in Heavy-Ion Reactions.

1973Ba74 H.W.Barz, V.E.Bunakov, A.M.El-Naiem - Nucl.Phys. A217, 141 (1973).
Recent Developments in the Theory of Stripping to Unbound States.

1973Bi01 H.G.Bingham, H.T.Fortune, J.D.Garrett, R.Middleton - Phys.Rev. C7, 57 (1973).
Three-Nucleon Transfer to Mirror States in ^{17}O and ^{17}F.

1973Bo26 M.Bormann, D.Kaack, V.Schroder, W.Scobel, L.Wilde - Z.Phys. 258, 285 (1973).
The (n,α) Reactions on ^{11}B, ^{14}N and ^{16}O with 14 MeV Neutrons.

1973Bu14 C.E.Busch, T.R.Donoghue, J.A.Keane, H.Paetz gen.Schieck, R.G.Seyler - Phys.Rev. C8, 848 (1973).
Note on the Parities of the 7.97- to 8.197-MeV States in ^{17}O and the $^{13}C(\alpha,n)^{16}O$ Reaction as a Source of Polarized Neutrons.

1973Ca30 S.Cavallaro, A.Cunsolo, R.Potenza, A.Rubbino - Nuovo Cim. 14A, 692 (1973).
$^{16}O + d$ Reactions at $E < 2$ MeV.

1973Cl09 C.F.Clement - Nucl.Phys. A213, 469 (1973).
Theory of Overlap Functions (I). Single Particle Sum Rules and Centre-of-Mass Corrections.

1973Da17 S.E.Darden, S.Sen, H.R.Hiddleston, J.A.Aymar, W.A.Yoh - Nucl.Phys. A208, 77 (1973).
Study of (d,p) Reactions to Unbound States of ^{13}C and ^{17}O.

1973De32 R.J.de Meijer, C.Delaune, D.McShan, J.W.Nelson, H.A.van Rinsvelt - Nucl.Phys. A209, 424 (1973).
β-Decay of ^{17}N to Unbound States of ^{17}O.

1973Do02 E.I.Dolinsky, P.O.Dzhamalov, A.M.Mukhamedzhanov - Nucl.Phys. A202, 97 (1973).
Peripheral-Model Approach to Stripping into Resonant States.

1973Ei01 J.M.Eisenberg, R.Guy, J.V.Noble, H.J.Weber - Phys.Lett. 43B, 20 (1973).
Pion Production by 600 MeV Protons on Light Nuclei.

1973Ei05 J.M.Eisenberg, R.Guy, J.V.Noble, H.J.Weber - Phys.Lett. 45B, 93 (1973).
Pion Production by 600 MeV Protons on Light Nuclei.

1973Er03 T.Erikson - Nucl.Phys. A205, 593 (1973).
Magnetic Moment and Deformed Component in ^{41}Ca and ^{39}K.

1973Fo11 J.L.Fowler, C.H.Johnson, R.M.Feezel - Phys.Rev. C8, 545 (1973).
Level Structure of ^{17}O from Neutron Total Cross Sections.

1973FoZU J.L.Fowler, C.H.Johnson, R.M.Feezel - ORNL-4844, p.43 (1973).
The level structure of ^{17}O from neutron total cross sections.

1973Ge04 C.K.Gelbke, R.Bock, P.Braun-Munzinger, D.Fick, K.D.Hildenbrand, W.Weiss, S.Wenneis, G.Baur - Phys.Lett. 43B, 284 (1973).
Angular Momentum Transfer in Nucleon Exchange Scattering of Heavy Ions.

1973Ge13 C.K.Gelbke, K.D.Hildenbrand, W.Weiss, R.Bock - Izv.Akad.Nauk SSSR, Ser.Fiz. 37, 1971 (1973); Bull.Acad.Sci.USSR, Phys.Ser. 37, No.9, 148 (1974).
Interference between Elastic Scattering of Heavy Ions and the Corresponding Nucleon Transfer Reaction.

1973Hi09 G.T.Hickey, F.W.K.Firk, R.J.Holt, R.Nath, H.L.Schultz - Phys.Lett. 47B, 348 (1973).
Polarization of Neutrons Elastically Scattered from ^{16}O.

1973Ho32 V.Horsfjord - Phys.Lett. 45B, 455 (1973).
Charge Radii and Polarization Effects in the Oxygen Region.

1973Ig02 M.Igarashi, M.Kawai, K.Yazaki - Progr.Theor.Phys. 49, 825 (1973).
An Analysis of Some Neutron Transfer Reactions Using Microscopic FormFactors.

1973Jo01 C.H.Johnson - Phys.Rev. C7, 561 (1973); Erratum Phys.Rev. C8, 851 (1973).
Unified R-Matrix-Plus-Potential Analysis for $^{16}O + n$ Cross Sections.

1973Jo10 R.C.Johnson, F.D.Santos, R.C.Brown, A.A.Debenham, G.W.Greenlees, J.A.R.Griffith, O.Karban, D.C.Kocher, S.Roman - Nucl.Phys. A208, 221 (1973).
Vector and Tensor Analysing Power of (d,p) Reactions and Deuteron D-State Effects.

1973Ku18 B.I.Kuznetsov, I.P.Chernov, R.E.Ovsyannikova - Yad.Fiz. 18, 950 (1973); Sov.J.Nucl.Phys. 18, 490 (1974).
Back Scattering of α Particles by C^{12} and C^{13}.

1973Le28 V.M.Lebedev, A.V.Spasskii, I.B.Teplov - Izv.Akad.Nauk SSSR, Ser.Fiz. 37, 2663 (1973); Bull.Acad.Sci.USSR, Phys.Ser. 37, No.12, 177 (1974).

REFERENCES FOR A=17(CONTINUED)

Study of the Reaction $^{13}C(\alpha,d)^{15}N$.

1973LiYQ REPT Ohio State Univ,VDG-009 P47.

1973LiZH CONF Asilomar(Photonuclear Reactions),Vol2 P931.

1973Lo16 E.A.Lorch - Int.J.Appl.Radiat.Isotop. 24, 585 (1973).
Neutron Spectra of $^{241}Am/B$, $^{241}Am/Be$, $^{241}Am/F$, $^{242}Cm/Be$, $^{238}Pu/^{13}C$ and ^{252}Cf Isotopic Neutron.

1973Me18 H.O.Meyer, W.A.Friedman - Phys.Lett. 45B, 441 (1973).
Compound-Nucleus Contributions to the T(20) Analyzing Power in (d,p) Reactions.

1973Or09 Y.V.Orlov - Yad.Fiz. 18, 1028 (1973); Sov.J.Nucl.Phys. 18, 529 (1974).
Peripheral-Model Analysis of (p,d) Reactions with Allowance for the Nuclear Form Factor.

1973Pi09 M.Pignanelli, J.Gosset, F.Resmini, B.Mayer, J.L.Escudie - Phys.Rev. C8, 2120 (1973).
$^{18}O(p,d)^{17}O$ and $^{18}O(p,t)^{16}O$ Reactions by a Polarized Proton Beam.

1973Po11 A.R.Poletti, J.G.Pronko - Phys.Rev. C8, 1285 (1973).
Beta Decay of ^{17}N.

1973PrZL THESIS DABBB 33B 5452.

1973Re17 B.S.Reehal, B.H.Wildenthal - Part.Nucl. 6, 137 (1973).
A Shell-Model Calculation for Masses 15, 16, and 17.

1973Sc26 P.Schumacher, N.Ueta, H.H.Duhm, K.-I.Kubo, W.J.Klages - Nucl.Phys. A212, 573 (1973).
Lithium Elastic and Inelastic Scattering and Lithium-Induced Single Nucleon Transfer Reactions.

1973Wi05 J.L.Wiza, H.T.Fortune - Phys.Rev. C7, 1267 (1973).
Comment on the Spin of the 5.46-MeV Level of ^{19}O.

1974AbZZ REPT JINR-P15-7216,M Abuzeid.

1974Ba19 G.Baur, D.Trautmann - Z.Phys. 267, 103 (1974).
On the Theory of Stripping Reactions into the Continuum.

1974Ba46 G.Baur, H.H.Wolter - Phys.Lett. 51B, 205 (1974).
Multistep Transfer Processes in Inelastic Heavy Ion Reactions.

1974Be32 E.Bellotti, E.Fiorini, P.Negri - Lett.Nuovo Cim. 9, 251 (1974).
A Search for Parity-Nonconserving Effects in the $^{12}C(\alpha,\gamma)^{16}O$ Reaction.

1974Bo13 H.G.Bohlen, W.Norenberg - Phys.Lett. 49B, 227 (1974).
Molecular Orbitals and Multiple Transfer in the Elastic Collision of ^{16}O on ^{17}O.

1974Ch58 I.P.Chernov, B.I.Kuznetsov, V.V.Kozyr, V.A.Matusevich - Izv.Akad.Nauk SSSR, Ser.Fiz. 38, 2530 (1974); Bull.Acad.Sci.USSR, Phys.Ser. 38, No.12, 58 (1974).
Back Scattering of Helium Ions by Light Nuclei.

1974Co04 M.D.Cooper, W.F.Hornyak, P.G.Roos - Nucl.Phys. A218, 249 (1974).
Deuteron Stripping to the Single Particle States of ^{17}O.

1974Co10 M.D.Cooper, W.Galati, W.F.Hornyak - Nucl.Phys. A221, 528 (1974).
Extraction of Spectroscopic Factors Using R-Matrix Theory.

1974Da23 S.Dahlgren, P.Grafstrom, B.Hoistad, A.Asberg - Nucl.Phys. A227, 245 (1974).
Positive Pion Production on ^{16}O, ^{28}Si and ^{40}Ca by 185 MeV Protons.

1974Fo17 H.T.Fortune, C.M.Vincent - Phys.Rev. C10, 1233 (1974).
Neutron Strength of the 5.08-MeV $3/2^+$ State of ^{17}O.

1974Ge01 C.K.Gelbke, G.Baur, R.Bock, P.Braun-Munzinger, W.Grochulski, H.L.Harney, R.Stock - Nucl.Phys. A219, 253 (1974).
Interference between Inelastic Scattering and Transfer in the Scattering of ^{16}O on ^{17}O.

1974Ge03 J.George, R.J.Philpott - Phys.Rev.Lett. 32, 901 (1974).
Continuum-Shell-Model Description of Compound Resonances in the System $^{16}O + n$.

1974Go02 L.J.B.Goldfarb, K.Takeuchi - Nucl.Phys. A218, 396 (1974).
Effects of Non-Orthogonality and Virtual Excitations in Direct Reactions (II).

1974Ha25 D.L.Hanson, R.G.Stokstad, K.A.Erb, C.Olmer, M.W.Sachs, D.A.Bromley - Phys.Rev. C9, 1760 (1974).
Systematics of 'Quasimolecular' Resonances: A Search for Sub-Coulomb Resonant Structure in the Reactions $^{14}N + ^{14}N$ and $^{9}Be + ^{12}C$.

1974Ha27 S.R.Habbal, H.A.Mavromatis - Nucl.Phys. A223, 174 (1974).
Microscopic Nuclear Magnetic Moment Calculations Including Hartree-Fock Graphs.

1974HsZX S.T.Hsieh, K.T.Knopfle, G.Mairle, G.J.Wagner - Proc.Int.Conf.Nuclear Structure and Spectroscopy, Amsterdam, H.P.Blok, A.E.L.Dieperink, Eds., Vol.1, p.25 (1974).
Shell model calculations of non-normal parity states in the ^{16}O and ^{40}Ca region.

1974Im01 B.Imanishi, M.Ichimura, M.Kawai - Phys.Lett. 52B, 267 (1974).
Effects of Channel Non-Orthogonality in (d,p) Reactions.

1974Ku15 B.I.Kuznetsov, I.P.Chernov - Yad.Fiz. 20, 632 (1974); Sov.J.Nucl.Phys. 20, 340 (1975).
Investigation of the Mechanism of Backward Scattering of α Particlesby Light Nuclei.

1974Mi06 G.A.Miller - Nucl.Phys. A224, 269 (1974).
Positive Pion Production by 185 MeV Protons.

1974Ne03 J.M.Nelson, W.R.Falk - Nucl.Phys. A218, 441 (1974).
Spin-Dependence and Coherent Summations in Two-Nucleon Transfer Reactions.

REFERENCES FOR A=17(CONTINUED)

1974Pi05 M.Pignanelli, S.Micheletti, I.Iori, P.Guazzoni, F.G.Resmini, J.L.Escudie - Phys.Rev. C10, 445 (1974).
Energy Dependence of Two-Nucleon Transfer Reactions on Light Nuclei.

1974Ri09 P.Ring, P.Schuck - Z.Phys. 269, 323 (1974).
A Numerical Comparison of Three Different Approaches to the Weak or Intermediate Coupling Model for 2 Particle-1 Hole States.

1974Sa05 E.A.Sanderson, J.P.Elliott, H.A.Mavromatis, B.Singh - Nucl.Phys. A219, 190 (1974).
Second Order Binding Energies and Spectra with an Interaction Matrix Deduced from Phase Shifts.

1974Sc09 O.Schaile, H.Grawe, R.Konig - Nucl.Instrum.Methods 116, 185 (1974).
A High-Pressure Gas Cell for DSA Lifetime Measurements.

1975Be44 E.Bellotti, E.Fiorini, P.Negri, A.Pullia, L.Zanotti, I.Filosofo - Nuovo Cim. 29A, 106 (1975).
An Experiment on Isospin-Changing Parity Violation Involving Hadrons in Nuclei.

1975Co12 S.R.Cotanch - Phys.Lett. 57B, 123 (1975).
Coupled Channels Treatment of Transfer Reactions.

1975Cr04 G.B.Crinean, L.W.J.Wild, B.M.Spicer - Nucl.Phys. A244, 67 (1975).
Proton Reactions with ^{17}O (I). Elastic and Inelastic Scattering Reactions.

1975Ge08 J.George, R.J.Philpott - Phys.Rev. C12, 658 (1975).
Microscopic Model Study of Nucleon Elastic Scattering from ^{16}O.

1975Ha33 J.Havloujian, G.Ravalli, B.M.Spicer - Aust.J.Phys. 28, 247 (1975).
Differential Cross Sections for the ^{13}C(^{3}He,p_0) and ^{15}N(^{3}He,p_0) Reactions at 15 MeV.

1975Hs01 S.T.Hsieh, K.T.Knopfle, G.Mairle, G.J.Wagner - Nucl.Phys. A243, 380 (1975).
The Spectra of Mass 15, 16 and 17 Nuclei.

1975Im04 B.Imanishi, H.Onishi, O.Tanimura - Phys.Lett. 57B, 309 (1975).
The Multi-Step Effects in the ^{16}O-^{17}O Elastic and Inelastic Core-Exchange Scatterings.

1975Ki15 J.C.Kim, R.Yen, I.P.Auer, H.S.Caplan - Phys.Lett. 57B, 341 (1975).
Low-Lying Octupole Excitations in ^{17}O.

1975Na15 K.G.Nair, H.Voit, C.W.Towsley, M.Hamm, J.D.Bronson, K.Nagatani - Phys.Rev. C12, 1575 (1975).
Transfer Reactions with Heavy Ions on Light Nuclei.

1975Pa06 A.Partensky, C.Thevenet - Phys.Lett. 56B, 258 (1975).
Hyperfine Structure of ^{17}O π-Mesic Atom.

1975Po08 V.A.Poyarkov, G.A.Prokopets, V.I.Strizhak - Yad.Fiz. 21, 468 (1975); Sov.J.Nucl.Phys. 21, 245 (1975).
Low-Energy γ Rays Accompanying the Scattering of 14.9-MeV Neutrons by ^{16}O and ^{12}C.

1975Po10 J.E.Poth, M.W.Sachs, D.A.Bromley - Nuovo Cim. 28A, 215 (1975).
Transfer of Neutron-Proton Pairs in Heavy-Ion Interactions.

1975Re15 W.N.Reisdorf, P.H.Lau, R.Vandenbosch - Nucl.Phys. A253, 490 (1975).
One-Neutron and Two-Neutron Transfer in the Scattering of ^{18}O by ^{16}O.

1975Se03 H.P.Seiler, R.Kulessa, P.M.Cockburn, P.Marmier, P.H.Barker - Nucl.Phys. A241, 151 (1975).
Heavy-Ion One-Neutron Transfer Reactions Involving ^{13}C (I). Spectroscopic Factor Products.

1975Th01 M.J.Throop, Y.T.Cheng, D.K.McDaniels - Nucl.Phys. A239, 333 (1975).
Coulomb Excitation of ^{67}Zn and Core-Quasiparticle Coupling in $f_{5/2}$ Nuclei.

1975Ve10 N.I.Venikov, Y.A.Glukhov, V.I.Manko, B.G.Novatskii, A.A.Ogloblin, S.B.Sakuta, D.N.Stepanov, V.N.Unezhev, V.I.Chuev, N.I.Chumakov - Yad.Fiz. 22, 924 (1975); Sov.J.Nucl.Phys. 22, 481 (1975).
Nuclear Reactions Induced by Beryllium Ions.

1976Al02 D.E.Alburger, D.H.Wilkinson - Phys.Rev. C13, 835 (1976).
Beta Decay of ^{16}C and ^{17}N.

1976AuZZ I.P.Auer, R.Yen, J.C.Kim, R.S.Hicks, J.C.Bergstrom, H.S.Caplan, B.E.Norum - Bull.Am.Phys.Soc. 21, No.4, 517, AG12 (1976).
Electron Scattering Studies on ^{17}O.

1976Ba41 K.Bangert, U.E.P.Berg, K.Wienhard, H.Wolf - Z.Phys. A278, 295 (1976).
The Decay of the ^{18}O Giant Dipole Resonance to Excited Residual Nuclear States.

1976Bi03 R.E.Bigler, S.A.A.Zaidi, J.L.Horton, H.Seitz - Phys.Rev. C13, 528 (1976).
^{19}F(d,α_0)^{17}O and ^{19}F(d,α_1)^{17}O Reaction ExcitationFunction Measurements between 2.34 and 14.45 MeV.

1976Bo15 I.Borbely - Nucl.Phys. A262, 244 (1976).
Determination of Neutron Separation Vertex Constants of Light Nuclei from (d,p) Reaction Data.

1976Bo48 V.I.Borovlev, I.D.Lopatko - Izv.Akad.Nauk SSSR, Ser.Fiz. 40, 817 (1976); Bull.Acad.Sci.USSR, Phys.Ser. 40, No.4, 107 (1976).
Vector Analyzing Power of the Reaction of Deuterons with ^{16}O Nuclei and Level Characteristics of ^{18}F.

1976Ca28 G.Calvi, S.Cavallaro, R.Potenza, F.Riggi, C.Spitaleri - Lett.Nuovo Cim. 17, 467 (1976).
Intermediate Structure in ^{15}N(d,α) Reaction at $E < 3$ MeV.

1976Ch04 C.C.Chang, E.M.Diener, E.Ventura - Nucl.Phys. A258, 91 (1976).
Study of the ^{14}C(τ,γ)^{17}O Radiative Capture Reaction from 3.2 to 7.5 MeV.

1976Co01 S.R.Cotanch, C.M.Vincent - Phys.Rev.Lett. 36, 21 (1976).
Simple Approximation for Multistep Amplitudes.

REFERENCES FOR A=17(CONTINUED)

1976Co27 H.T.Coelho, F.A.B.Coutinho, A.F.R.de Toledo Piza - Phys.Rev. C14, 1280 (1976).
Backscattering of α Particles by Light Nuclei.

1976Co29 S.R.Cotanch, C.M.Vincent - Phys.Rev. C14, 1739 (1976).
Channel Coupling and Nonorthogonality in Elastic and Transfer Processes.

1976Dr08 L.Drigo, G.Tornielli, G.Zannoni - Nuovo Cim. 31A, 1 (1976).
Polarization in the $^{16}O(n,n)$ Reaction.

1976Fi03 P.Fintz, G.Guillaume, F.Jundt, I.Ordonez, A.Gallmann, D.E.Alburger - Nucl.Phys. A259, 493 (1976).
Etude de Neutrons Retardes de la Reaction ^{10}Be + ^{11}B.

1976Ku06 K.-I.Kubo, K.G.Nair, K.Nagatani - Phys.Rev.Lett. 37, 222 (1976).
Anomalous Angular Distributions and the Unique Structure of the l = 1Transition Amplitude.

1976La13 R.D.Lawson, F.J.D.Serduke, H.T.Fortune - Phys.Rev. C14, 1245 (1976).
Structure of Low-Lying Positive-Parity States of ^{18}O.

1976Le27 H.C.Lee, F.C.Khanna, M.A.Lone, A.B.McDonald - Phys.Lett. 65B, 201 (1976).
Doubly Radiative Neutron Capture by ^{2}H, ^{3}He, ^{16}O and ^{208}Pb.

1976Ma05 H.A.Mavromatis - Nucl.Phys. A257, 109 (1976).
Goldstone Graph Components in Perturbation Calculations.

1976Mc11 A.B.McDonald, T.K.Alexander, O.Hausser - Nucl.Phys. A273, 464 (1976).
Isospin-Forbidden Particle Decays in Light Nuclei (II). Widths of T =3/2 Levels of ^{17}O.

1976Mo03 T.Motobayashi, I.Kohno, K.Katori, M.Yoshie, T.Ohi, H.Kamitsubo - Phys.Rev.Lett. 36, 390 (1976).
Anomalous Angular Distribution in the Transition to the $2s_{1/2}$ State in ^{17}O.

1976Na09 K.G.Nair, K.Nagatani, H.Voit - Phys.Rev.Lett. 36, 1293 (1976).
Comparisons of Proton and Neutron Transfer Reactions and Explicit Coulomb Effects.

1976Oh05 H.Ohm, W.Rudolph, K.-L.Kratz - Nucl.Phys. A274, 45 (1976).
Beta-Delayed Neutron Emission Following the Decay of ^{17}N.

1976Ra36 E.Ramstrom, T.Wiedling - Nucl.Phys. A272, 259 (1976).
The Excitation Function of the $^{13}C(\alpha,n)^{16}O$ Reaction and its Astrophysical Application.

1976Sa04 F.D.Santos - Phys.Rev. C13, 1145 (1976).
1^- and j-Dependent Effect in (d,p) Reactions.

1976Sh13 R.Shyam, S.Mukherjee - Phys.Rev. C13, 2099 (1976).
Deuteron Stripping Reaction to Unbound States.

1976We21 G.D.Westfall, S.A.A.Zaidi - Phys.Rev. C14, 610 (1976).
Reactions Induced by ^{13}C on ^{12}C, ^{16}O, ^{28}Si, and ^{32}S.

1976WeZE G.D.Westfall - Diss.Abst.Int. 36B, 5117 (1976).

1977Aj01 F.Ajzenberg-Selove, E.R.Flynn, S.Orbesen, J.W.Sunier - Phys.Rev. C15, 1 (1977).
States of ^{34}P.

1977Aj02 F.Ajzenberg-Selove - Nucl.Phys. A281, 1 (1977).
Energy Levels of Light Nuclei A = 16-17.

1977Al18 D.J.Albert, A.Nagl, J.George, R.F.Wagner, H.Uberall - Phys.Rev. C16, 503 (1977).
Isospin Splitting of Giant Resonances in ^{13}C and ^{17}O.

1977Al20 D.E.Alburger - Phys.Rev. C16, 889 (1977).
Half-Life of ^{17}F.

1977Az01 G.Azuelos, J.E.Kitching, K.Ramavataram - Phys.Rev. C15, 1847 (1977).
Half-Lives and Branching Ratios of Some T = 1/2 Nuclei.

1977Bo42 I.Borbei, E.I.Dolinskii, A.M.Mukhamedzhanov, V.V.Turovtsev - Yad.Fiz. 26, 516 (1977); Sov.J.Nucl.Phys. 26, 274 (1977).
Effects of the Nuclear Vertex Form Factor in the Peripheral Model.

1977Br01 R.Brockmann, M.Dillig - Phys.Rev. C15, 361 (1977).
Relativistic Effects in a One-Nucleon Model for Proton Induced Pion Production.

1977Ca03 G.Calvi, S.Cavallaro, R.Potenza, F.Riggi, C.Spitaleri - Lett.Nuovo Cim. 18, 77 (1977).
Excitation Functions of (d,d) and (d,p) Reactions on ^{15}N in the Deuteron Energy Range E = (1.4-2.7) MeV.

1977Du04 J.L.Durell, C.Harter, W.R.Phillips - Phys.Lett. 70B, 405 (1977).
Effective Charges and Radial Integrals in A = 17 Nuclei.

1977FoZZ H.T.Fortune, M.E.Cobern, G.E.Moore, S.LaFrance - Bull.Am.Phys. 22, No.1, 28, AH8 (1977).
New Measurement of $^{18}O(d,t)^{17}O$.

1977Fr19 H.Franz, W.Rudolph, H.Ohm, K.-L.Kratz, G.Herrmann, F.M.Nuh, D.R.Slaughter, S.G.Prussin - Nucl.Instrum.Methods 144, 253 (1977).
Delayed-Neutron Spectroscopy with ^{3}He Spectrometers.

1977Gr20 J.M.Greben, F.S.Levin - Phys.Lett. 71B,252(1977).
Comparison of the Channel Coupling Array and CRC Methods for a Realistic Nuclear Transfer-Reaction Model.

1977Ho04 Y.Horikawa, T.Hoshino, A.Arima - Nucl.Phys. A278, 297 (1977).
Core Polarization Effects on the Coulomb Form Factor.

1977Ko28 G.Konopka, M.Gari, J.G.Zabolitzky - Nucl.Phys. A290, 360 (1977); Erratum Nucl.Phys. A306, 536 (1978).

REFERENCES FOR A=17(CONTINUED)

Magnetic Moments of Light Nuclei.
1977Li19 H.Liskien, A.Paulsen - Atomkernenergie 30, 59 (1977).
Neutron Yields of Light Elements under α-Bombardment.
1977Ma10 G.Mairle, K.T.Knopfle, P.Doll, J.Breuer, G.J.Wagner - Nucl.Phys. A280, 97 (1977).
The (d,t) and (d,τ) Reactions on ^{18}O and the 1p Spin-Orbit Splitting.
1977Mc05 A.B.McDonald, E.D.Earle, M.A.Lone, F.C.Khanna, H.C.Lee - Nucl.Phys. A281, 325 (1977).
Doubly Radiative Thermal Neutron Capture in ^{2}H and ^{16}O: Experiment and Theory.
1977Mu04 S.N.Mukherjee, R.Shyam, S.Pal, N.K.Ganguly - Phys.Rev. C15, 1238 (1977).
Distorted Wave Analysis of (d,p) Reactions to Decaying States.
1977No06 B.E.Norum, J.C.Bergstrom, H.S.Caplan - Nucl.Phys. A289, 275 (1977).
Electroexcitation of the Giant Resonance of ^{17}O.
1977No07 J.M.Normand - Nucl.Phys. A291, 126 (1977).
Microscopic Description of Low-Energy Neutron Scattering by Nuclei.
1977Oh02 H.Ohnuma, T.Suehiro, T.Tanabe, S.Yamada - J.Phys.Soc.Jap. 42, 382 (1977).
(p,d) Reactions at 52 Mev. III. ^{28}Si(p,d) and ^{18}O(p,d).
1977Pe08 J.F.Petersen, D.Dehnhard, B.F.Bayman - Phys.Rev. C15, 1719 (1977).
Single-Neutron Transfer to ^{29}Si, ^{41,49}Ca, and ^{55}Fe StatesInduced by the (^{18}O,^{17}O(g.s.)) And (^{18}O,^{17}O(0.87 MeV)) Reactions.
1977Po16 A.Poves, A.L.Cedillo, J.M.G.Gomez - Nucl.Phys. A293, 397 (1977).
Configuration Mixing and the Coulomb Energy Anomaly.
1977Sa19 A.M.Santana, H.T.Coelho, T.K.Das - Phys.Rev. C16, 1785 (1977).
Scattering of α Particles by Light Nuclei.
1977Si01 R.R.Silbar, J.N.Ginocchio, M.M.Sternheim - Phys.Rev. C15, 371 (1977).
Dramatic Nuclear Structure Effects in (π,πN) Reactions.
1977St20 D.P.Stahel, G.J.Wozniak, M.S.Zisman, B.D.Jeltema, J.Cerny - Phys.Rev. C16, 1456 (1977).
(^{9}Be,^{8}Be) Reaction at 50 MeV.
1977Sw05 Z.E.Switkowski, Shiu-Chin Wu, J.C.Overley, C.A.Barnes - Nucl.Phys. A289, 236 (1977).
^{9}Be + ^{12}C, ^{9}Be + ^{16}O, ^{9}Be + ^{19}F Reactions at Energies below the Barrier.
1978Am05 H.Amakawa, A.Mori, K.Yazaki - Phys.Lett. 76B, 157 (1978).
Two-Step Process in Proton Inelastic Scattering.
1978Ar04 A.Arima, Y.Horikawa, H.Hyuga, T.Suzuki - Phys.Rev.Lett. 40, 1001 (1978).
Core-Polarization and Exchange-Current Effects on the Magnetic Form Factor of ^{17}O.
1978Ar15 K.P.Artemov, V.Z.Goldberg, I.P.Petrov, V.P.Rudakov, I.N.Serikov, V.A.Timofeev, R.Wolski, J.Szmider - Yad.Fiz. 28, 288 (1978); Sov.J.Nucl.Phys. 28, 145 (1978).
α-Cluster States in ^{17}O Observed in the Reaction ^{13}C(^{6}Li,d)^{17}O(α)^{13}C.
1978Ar17 D.Ardouin, B.Remaud, K.Kumar, F.Guilbault, P.Avignon, R.Seltz, M.Vergnes, G.Rotbard - Phys.Rev. C18, 2739 (1978).
Nuclear Structure Investigations of the Ge Isotopes by Means of (p,t)Reactions and Microscopic Studies of Nuclear Deformations and Collective Spectra.
1978Ch03 R.Chechik, Y.Eyal, H.Stocker, Z.Fraenkel - Nucl.Phys. A296, 307 (1978).
Elastic Scattering of ^{17,18}O on ^{12,13}C at E(c.m.) = 12.6-14.0 MeV.
1978Cl08 M.E.Clark, K.W.Kemper, J.D.Fox - Phys.Rev. C18, 1262 (1978).
Location of High Spin 4p-3h Strength in ^{17}O.
1978Fo05 H.T.Fortune, M.E.Cobern, G.E.Moore - Phys.Rev. C17, 888 (1978).
^{18}O(d,t)^{17}O and the Ground-State Wave Function of ^{18}O.
1978Fo22 H.T.Fortune, J.N.Bishop, L.R.Medsker, B.H.Wildenthal - Phys.Rev.Lett. 41, 527 (1978).
Direct Determination of $[(sd)^3]_{5/2\ 1/2}(1p^{-2})_{01}$ Component In ^{17}O(g.s.).
1978Ho16 R.J.Holt, H.E.Jackson, R.M.Laszewski, J.E.Monahan, J.R.Specht - Phys.Rev. C18, 1962 (1978).
Effects of Channel and Potential Radiative Transitions in the ^{17}O(γ,n_0)^{16}O Reaction.
1978Ki01 J.C.Kim, R.S.Hicks, R.Yen, I.P.Auer, H.S.Caplan, J.C.Bergstrom - Nucl.Phys. A297, 301 (1978).
Electron Scattering from ^{17}O.
1978Kr02 E.M.Krenciglowa, H.Bando - Nucl.Phys. A294, 191 (1978).
Extended Multiple-Scattering Approach for the 2p1h System and ^{17}O Valence Energies.
1978Ma44 J.F.Mateja, A.D.Frawley, A.Roy, J.R.Hurd, N.R.Fletcher - Phys.Rev. C18, 2622 (1978).
Resonances in ^{12}C + ^{9}Be.
1978No04 C.Nordborg, L.Nilsson, H.Conde, L.G.Stromberg - Nucl.Sci.Eng. 66, 75 (1978).
Gamma-Ray Production Cross Sections of Neutron-Induced Reactions in Oxygen.
1978Yo02 S.K.Young, W.R.Gibbs - Phys.Rev. C17, 837 (1978).
Effect of Pion Distortion on the Asymmetry in (p,P^{+}) Reactions on Light Nuclei.
1978Ze03 N.S.Zelenskaya, V.M.Lebedev, T.A.Yushchenko - Yad.Fiz. 28, 90 (1978); Sov.J.Nucl.Phys. 28, 44 (1978).
The Eikonal Approximation and Distortions in the Mechanism of Heavy-Particle Stripping.
1979An15 B.D.Anderson, N.Jarmie, R.J.Barrett, E.D.Arthur - Phys.Rev. C20, 897 (1979).
The ^{16}O(d,p)^{17}O Reaction to the Unbound 5.09-MeV State of ^{17}O.

REFERENCES FOR A=17(CONTINUED)

1979An35 G.B.Andreev, A.P.Tomozov - Ukr.Fiz.Zh. 24, 1888 (1979).
Investigation of Vector Analyzing Power in the Reaction ^{19}F(d(pol),d)^{19}F and ^{19}F(d(pol),α)^{17}O in the Energy Interval 1.8-3.0 MeV with the use of Polarized Deuteron Beam.

1979Bo06 K.Bodek, M.Hugi, J.Lang, R.Muller, E.Ungricht, L.Jarczyk, B.Kamys, A.Strzalkowski - Phys.Lett. 82B, 369 (1979).
A Search for Resonances in ^{9}Be + ^{12}C Reactions in the Energy Range from 11.4 MeV to 14.8 MeV (CM).

1979Bo36 W.Bohne, K.Grabisch, J.Hergesell, Q.Liu, H.Morgenstern, W.Von Oertzen, W.Galster, W.Treu, H.H.Wolter - Nucl.Phys. A332, 501 (1979).
A Study of Two-Step Transfer Contributions to the Inelastic Scattering of ^{13}C on ^{16}O and ^{18}O.

1979Br04 H.S.Bradlow, W.D.M.Rae, P.S.Fisher, N.S.Godwin, G.Proudfoot, D.Sinclair - Nucl.Phys. A314, 207 (1979).
Heavy Ion Induced α-Transfer on Targets of Mass 12 to 15.

1979Br17 B.A.Brown, S.E.Massen, P.E.Hodgson - Phys.Lett. 85B, 167 (1979).
The Charge Distributions of the Oxygen and Calcium Isotopes.

1979Ch12 J.E.Christiansson, J.Dubois, H.Roth - Phys.Scr. 19, 245 (1979).
Reactions Induced by ^{16}O on ^{9}Be.

1979Co10 M.Conze, P.Manakos - J.Phys.(London) G5, 671 (1979).
Alpha-Structure Amplitudes for Nuclei in the Lower Half of the sd Shell.

1979Es04 H.Essel, K.E.Rehm, H.Bohn, H.J.Korner, H.Spieler - Phys.Rev. C19, 2224 (1979).
Inelastic Scattering of ^{18}O and ^{17}O Ions from Medium-Weight Nuclei.

1979Gr11 J.M.Greben, F.S.Levin - Nucl.Phys. A325, 145 (1979).
On the Description of Direct Nuclear Rearrangement Reactions Using Various Coupled Channel Equations.

1979GrZP P.Grabmayr, J.Rapaport, R.W.Finlay, S.M.Grimes, Y.Yamanouti, V.Kulkarni - Bull.Am.Phys.Soc. 24, No.7, 855, CG16 (1979).
Elastic and Inelastic Scattering of 24 MeV Nucleon from ^{16}O and ^{18}O.

1979GrZU P.Grabmayr, J.Rapaport, Y.Yamanouti, V.Kulkarni, S.M.Grimes, R.W.Finlay - Bull.Am.Phys.Soc. 24, No.4, 656, HF4 (1979).
Elastic and Inelastic Scattering of 24 MeV Neutrons from ^{16}O and ^{18}O.

1979Hy01 M.V.Hynes, H.Miska, B.Norum, W.Bertozzi, S.Kowalski, F.N.Rad, C.P.Sargent, T.Sasanuma, W.Turchinetz, B.L.Berman - Phys.Rev.Lett. 42, 1444 (1979).
Electron Scattering from the Ground-State Magnetization Distribution of ^{17}O.

1979Ja22 L.Jarczyk, B.Kamys, J.Okolowicz, J.Sromicki, A.Strzalkowski, H.Witala, Z.Wrobel, M.Hugi, J.Lang, R.Muller, E.Ungricht - Nucl.Phys. A325, 510 (1979).
Light Charged-Particle Production in the ^{9}Be + ^{12}C Reaction at 11.4 MeV c.m. Energy.

1979Jo05 R.G.Johnson, B.L.Berman, K.G.McNeill, J.G.Woodworth, J.W.Jury - Phys.Rev. C20, 27 (1979).
Photoneutron Reaction in ^{17}O: Ground-State Differential Cross Section At 98°.

1979KnZQ K.T.Knopfle, G.Mairle, H.Muller, H.Riedesel, K.Schindler, G.J.Wagner - MPI Heidelberg, 1978, Ann.Rept., p.93 (1979).
Spinbestimmung von 1p Lochzustanden mit T = 3/2 in ^{17}N,^{17}O,^{21}F und ^{21}Ne.

1979Ko26 L.Koester, K.Knopf, W.Waschkowski - Z.Phys. A292, 95 (1979).
Thermal Neutron Scattering Parameters for Light Nuclei (A = 12 to 27).

1979Kr05 E.M.Krenciglowa, H.Bando - Nucl.Phys. A322, 145 (1979).
Third-Order Treatment of the One-Body Effective Interaction.

1979Ma38 R.E.Marrs, R.E.Pollock, W.W.Jacobs - Phys.Rev. C20, 2308 (1979).
Total (p,π^+) Cross Sections on Light Nuclei Near the Pion CoulombBarrier.

1979Ma39 R.E.Marrs, R.E.Pollock - Phys.Rev. C20, 2446 (1979).
Inclusive (p,π^+) Cross Sections Near Threshold.

1979MaZO L.M.Martz - Diss.Abst.Int. 40B, 316 (1979).
Three-Nucleon Transfer Reactions and Cluster Structure in the A = 15 t0 A = 19 Nuclei.

1979Mi09 H.Miska, B.Norum, M.V.Hynes, W.Bertozzi, S.Kowalski, F.N.Rad, C.P.Sargent, T.Sasanuma, B.L.Berman - Phys.Lett. 83B, 165 (1979).
Precise Measurement of the Charge-Distribution Differences of the Oxygen Isotopes.

1979PiZU P.H.Pile - Diss.Abst.Int. 39B, 3391 (1979).
Near Threshold Positive Pion Production by Protons on Nuclei.

1979Ra10 W.D.M.Rae, N.S.Godwin, D.Sinclair, H.S.Bradlow, P.S.Fisher, J.D.King,A.A.Pilt, G.Proudfoot - Nucl.Phys. A319, 239 (1979).
Few-Nucleon Transfer Reactions on ^{15}N and ^{16}O.

1979SoZY F.Soga, R.D.Bent, P.H.Pile, R.E.Pollak, M.C.Green, T.P.Sjoreen - Bull.Am.Phys.Soc. 24, No.4, 614, DN7 (1979).
Pion Production by 200-MeV Protons on Nuclei.

1979SuZR T.S.Subramanian - Diss.Abst.Int. 40B, 805 (1979).
Neutron Induced Reactions on the Tissue Resident Elements ^{12}C,^{14}N and ^{16}O at Incident Neutron Energies of 27.4, 39.7 MeV and 60.7 MeV.

1979Wu05 N.Wust, H.Seyfarth, L.Aldea - Phys.Rev. C19, 1153 (1979).
Two-Quantum Radiative Thermal Neutron Capture in ^{1}H.

1980Am02 H.Amakawa, A.Mori, K.Yazaki - Nucl.Phys. A340, 125 (1980).
Two-Step Process and Effective Interaction in Proton Inelastic Scattering.

REFERENCES FOR A=17(CONTINUED)

1980Ay01 T.Aytimur, J.P.Svenne - Can.J.Phys. 58, 1026 (1980).
Three-Body Calculations of Elastic Scattering and Stripping of Deuterons on ^{16}O.

1980Bo04 G.Bohannon, L.Zamick, E.Moya de Guerra - Nucl.Phys. A334, 278 (1980).
Structural Considerations for Elastic Magnetic Electron-Nucleus Scattering.

1980Br05 V.N.Bragin, M.V.Zhukov, D.N.Stepanov, L.V.Chulkov, J.Jakiel - Yad.Fiz. 31, 29 (1980); Sov.J.Nucl.Phys. 31, 14 (1980).
Elastic Scattering and the Cluster Transfer at Interaction of Beryllium Ions with Carbogen.

1980Br13 B.A.Brown, W.Chung, B.H.Wildenthal - Phys.Rev. C22, 774 (1980).
Electromagnetic Multipole Moments of Ground States of Stable Odd-MassNuclei in the sd Shell.

1980Ce03 J.Cervena, J.Hoffmann, J.Kvitek, J.Vacik, F.Becvar, Yu.P.Popov - Czech.J.Phys. 30, 996 (1980).
The $^{147}Sm(n,\alpha)^{144}Nd$ *Reaction on 2 keV Neutrons.*

1980Ch35 W.H.Chung, Y.M.Shin - Nuovo Cim. 60A, 27 (1980).
The Positive-Parity States in ^{17}O *and* ^{17}F.

1980ChZJ S.-H.Chao - Diss.Abst.Int. 41B, 2225 (1980).
Three-Body Equations for Nuclear Reactions.

1980Ci03 S.Cierjacks, F.Hinterberger, G.Schmalz, D.Erbe, P.v.Rossen, B.Leugers - Nucl.Instrum.Methods 169, 185 (1980).
High Precision Time-of-Flight Measurements of Neutron Resonance Energies in Carbon and Oxygen between 3 and 30 MeV.

1980Da26 J.A.Davies, P.R.Norton - Nucl.Instrum.Methods 168, 611 (1980).
Absolute coverage measurement of adsorbed CO and D_2 *on platinum.*

1980Fa07 E.Fabrici, S.Micheletti, M.Pignanelli, F.G.Resmini, R.De Leo, G.D'Erasmo, A.Pantaleo - Phys.Rev. C21, 844 (1980).
Proton Elastic Scattering on Light Nuclei. II. Nuclear Structure Effects.

1980FlZU K.-H.Flodkvist, A.Johansson, L.Glantz, I.Koersner, B.Sundqvist - Proc.Int.Conf.on Nucl.Phys., Berkeley, p.74 (1980).
Oxygen induced deuteron breakup.

1980GlZZ S.G.Glendinning - Diss.Abst.Int. 41B, 606 (1980).
Elastic and Inelastic Neutron Scattering Cross Sections for ^{10}B,^{11}B *and* ^{16}O.

1980Gr15 P.Grabmayr, J.Rapaport, R.W.Finlay - Nucl.Phys. A350, 167 (1980).
Elastic and Inelastic Scattering of 24 MeV Nucleons from Oxygen Isotopes.

1980Hi01 J.C.Hill, R.F.Petry, K.H.Wang - Phys.Rev. C21, 384 (1980).
Identification and Decay of Neutron-Rich ^{39}S.

1980Hy03 H.Hyuga, A.Arima, K.Shimizu - Nucl.Phys. A336, 363 (1980).
Exchange Magnetic Moments.

1980Ju01 J.W.Jury, B.L.Berman, D.D.Paul, P.Meyer, J.G.Woodworth - Phys.Rev. C21, 503 (1980).
Photoneutron Cross Sections for ^{17}O.

1980Kr18 V.M.Krasnopolsky, V.I.Kukulin - Phys.Lett. B96, 4 (1980).
A New Method to Describe the Stripping to Unbound States and Other Reactions with Unstable Particles.

1980Li05 I.Linck, L.Kraus, S.L.Blatt - Phys.Rev. C21, 791 (1980).
Radiative Capture of Tritons by ^{14}N *and* ^{17}O *Levels Above 19 MeV.*

1980Ne05 B.Neumann, H.Rebel, J.Buschmann, H.J.Gils, H.Klewe-Nebenius, S.Zagromski - Z.Phys. A296, 113 (1980).
Projectile Break-Up in Continuous Particle Spectra from Nuclear Reactions Induced by 156 MeV ^{6}Li.

1980Pr09 G.Proudfoot, H.S.Bradlow, P.S.Fisher, N.S.Godwin, J.King, D.Sinclair,W.D.M.Rae - Nucl.Phys. A345, 278 (1980).
Sequential Calculations for Heavy-Ion Induced Two-Nucleon Transfer on^{14}N,^{15}N *and* ^{16}O.

1980Py01 R.E.Pywell, M.N.Thompson, B.L.Berman - Nucl.Instrum.Methods 178, 149 (1980).
A Measurement of the ^{18}O *Photonuclear Cross Sections as a Test of a Bremsstrahlung Unfolding Technique.*

1980Si12 S.J.Singleton, V.Managoli, L.J.B.Goldfarb - Nucl.Phys. A342, 312 (1980).
Non-Orthogonality Effects in Heavy-Ion Transfer Reactions.

1980Va05 J.P.Vary, R.H.Belehrad, R.J.McCarthy - Phys.Rev. C21, 1626 (1980).
Valence-Core Self-Consistency in the A = 17 System.

1980Wa24 E.K.Warburton, D.E.Alburger, D.J.Millener - Phys.Rev. C22, 2330 (1980).
Energies and Branching Ratios of γ *transitions in* ^{13}C.

1981Au04 N.Auerbach, Nguyen Van Giai - Phys.Rev. C24, 782 (1981).
Transition Densities for Isobaric Analog States.

1981Bo03 A.Boudard, Y.Terrien, R.Beurtey, L.Bimbot, G.Burge, A.Chaumeaux, P.Couvert, J.M.Fontaine, M.Garcon, Y.Le Bornec, D.Legrand, L.Schecter, J.P.Tabet, M.Dillig - Phys.Rev.Lett. 46, 218 (1981).
Investigation of the (d,p) Stripping Reaction around 700 MeV.

1981Ci03 M.A.Cirit, F.Yazici - Phys.Rev. C23, 2627 (1981).
Fragment Spectra in High Energy Proton-Nucleus Collisions.

1981Co18 E.D.Cooper, H.S.Sherif - Phys.Rev.Lett. 47, 818 (1981).
Pion Production,Nuclear Dirac Phenomenology,and the πNN *Vertex.*

1981Cu11 A.Cunsolo, A.Foti, G.Imme, G.Pappalardo, G.Raciti, N.Saunier - Phys.Rev. C24, 2127 (1981).
$^{14}C(^{6}Li,t)^{17}O$ *Reaction at* $E(^{6}Li)$ *= 34 MeV.*

1981De09 L.C.Dennis, K.R.Cordell, R.R.Doering, R.L.Parks, S.T.Thornton, J.L.C.Ford, Jr., J.Gomez Del Campo, D.Shapira - Nucl.Phys. A357, 521 (1981).

REFERENCES FOR A=17(CONTINUED)

Search for Resonances in $^{12}C(^{9}Be,\alpha)^{17}O$.
1981HaZV J.J.Hamill, D.A.Lind, R.J.Peterson, R.S.Raymond, P.A.Smith, M.Yasue, C.D.Zafiratos - Bull.Am.Phys.Soc. 26, No.4, 579, EG7 (1981).
High Spin States in Light Nuclei from the (α,n) and (α,p) Reactions.
1981Hi01 F.Hinterberger, P.Von Rossen, S.Cierjacks, G.Schmalz, D.Erbe, B.Leugers - Nucl.Phys. A352, 93 (1981).
High-Resolution Study of $^{16}O + n \rightarrow {}^{17}O$ (T=3/2) Resonances.
1981Hu12 M.Hugi, J.Lang, R.Muller, J.Sromicki, E.Ungricht, L.Jarczyk, A.Strzalkowski, H.Witala - Fizika(Zagreb) 13, Suppl.No.1, 13 (1981).
Statistical Significance of the Deviation Function in a Search for Resonances.
1981Ja09 L.Jarczyk, B.Kamys, A.Magiera, J.Sromicki, A.Strzalkowski, G.Willim, Z.Wrobel, D.Balzer, K.Bodek, M.Hugi, J.Lang, R.Muller, E.Ungricht - Nucl.Phys. A369, 191 (1981).
Energy Dependence of Fusion and Reaction Cross Sections in the $^{9}Be+ {}^{12}C$ System.
1981La15 J.Lang, M.Hugi, R.Muller, J.Sromicki, E.Ungricht, H.Witala, L.Jarczyk, A.Strzalkowski - Phys.Lett. 104B, 369 (1981).
Statistical Significance of the Deviation Function in a Search for Resonances.
1981Ma14 G.Mairle, G.J.Wagner, K.T.Knopfle, Liu Ken Pao, H.Riedesel, V.Bechtold, L.Friedrich - Nucl.Phys. A363, 413 (1981).
Deformation of 1p Shells in (2s,1d) Shell Nuclei from a Systematic Study of (d(pol),^{3}He) Reactions.
1981Ma16 A.Malinovski, J.Coustham, H.Glattli - Nucl.Phys. A365, 103 (1981).
Spin-Dependent Scattering of Slow Neutrons on Polarized ^{17}O.
1981Ma46 B.Maurel, G.Amsel, D.Dieumegard - Nucl.Instrum.Methods 191, 349 (1981).
Microanalysis of fluorine by nuclear reactions II. ^{19}F+d reactions.
1981MuZQ S.F.Mughabghab, M.Divadeenam, N.E.Holden - Neutron Cross Sections, Vol.1, Neutron Resonance Parameters and Thermal Cross Sections, Part A, Z = 1-60, Academic Press, New York (1981).
1981Os04 E.Oset, D.Strottman - Nucl.Phys. A355, 437 (1981).
Pion-Induced Single Charge Exchange and Nuclear Structure.
1981Sh17 V.R.Shaginyan - Yad.Fiz. 33, 1473 (1981).
Calculation of the Mass Difference for Mirror Nuclei.
1981Sj02 T.P.Sjoreen, P.H.Pile, R.E.Pollock, W.W.Jacobs, H.O.Meyer, R.D.Bent, M.C.Green, F.Soga - Phys.Rev. C24, 1135 (1981).
Positive Pion Production from the Bombardment of ^{10}B,^{12}C,^{16}O,and ^{40}Ca with 147- to 159-MeV Polarized Protons.
1981Sj03 T.P.Sjoreen, P.H.Pile, R.D.Bent, M.C.Green, J.J.Kehayias, R.E.Pollock, F.Soga, M.C.Tsangarides, J.G.Wills - Phys.Rev. C24, 2569 (1981).
Positive Pion Production by 149 – 166 MeV Protons on ^{16}O and ^{28}Si.
1981Ta09 K.C.Tam, H.Muther, H.M.Sommermann, T.T.S.Kuo, A.Faessler - Nucl.Phys. A361, 412 (1981).
A Folded Diagram Microscopic Calculation of Nuclear Coulomb Displacement Energies.
1982Ab04 M.S.Abdel-Wahab, L.Potvin, R.Roy, P.Bricault, R.Larue, D.Pouliot, C.Rioux, R.J.Slobodrian - Can.J.Phys. 60, 1595 (1982).
Spin-Orbit Effects in Optical Model Analyses of ^{3}He Elastic Scattering on Oxygen Isotopes.
1982Aj01 F.Ajzenberg-Selove - Nucl.Phys. A375, 1 (1982).
Energy Levels of Light Nuclei A = 16-17.
1982Ba53 F.C.Barker - Aust.J.Phys. 35, 301 (1982).
GDR Contribution to Coulomb Excitation. II. ^{17}O.
1982Be64 M.Berti, A.V.Drigo - Nucl.Instrum.Methods 201, 473 (1982).
Simultaneous nuclear microanalysis of nitrogen and oxygen on silicon.
1982Co03 S.A.Coon, R.J.McCarthy, J.P.Vary - Phys.Rev. C25, 756 (1982).
Three-Body Force Effects in the ^{17}O Magnetic Form Factor.
1982Co07 E.D.Cooper, H.S.Sherif - Phys.Rev. C25, 3024 (1982).
Distortion Effects in a Relativistic One-Nucleon Model for the (p,π^{+}) Reaction.
1982CrZY P.N.Craig, J.J.Hamill, D.A.Lind, T.G.Masterson, R.J.Peterson, R.S.Raymond, J.L.Ullman, M.Yasue, C.D.Zafiratos - Bull.Am.Phys.Soc. 27, No.4, 561, HXa14 (1982).
Excitation of High-Spin States in ^{16}O by the $^{13}C(\alpha,n)$ Reaction.
1982FiZW H.W.Fielding, S.Elbakr, R.L.Helmer, I.J.Van Heerden, A.H.Hussein, S.P.Kwan, S.T.Lam, G.C.Neilson, T.Otsubo, J.Soukup - Bull.Am.Phys.Soc. 27, No.4, 542, GYa3 (1982).
Asymmetry Measurements for Elastically Scattered 23 MeV Neutrons fromPb, ^{59}Co, and ^{16}O.
1982Gl09 S.G.Glendinning, S.El-Kadi, C.E.Nelson, F.O.Purser, C.R.Gould, L.W.Seagondollar - Nucl.Sci.Eng. 82, 393 (1982).
Neutron Elastic Scattering Cross Sections for ^{16}O between 9 and 15MeV.
1982He07 B.Heusch, C.Beck, J.P.Coffin, P.Engelstein, R.M.Freeman, G.Guillaume,F.Haas, P.Wagner - Phys.Rev. C26, 542 (1982).
Entrance Channel Effects for Complete Fusion of O + C Isotopes.
1982Hi01 R.S.Hicks - Phys.Rev. C25, 695 (1982).
Magnetic Electron Scattering and the Radius of the $1d_{5/2}$ Orbit in ^{17}O.
1982Hs01 H.-H.Hsu - Nucl.Instrum.Methods 193, 383 (1982).
The 870.8 keV Gamma Ray from PuO_2.
1982Hu06 M.Hugi, J.Lang, R.Muller, J.Sromicki, E.Ungricht, K.Bodek, L.Jarczyk,B.Kamys, A.Strzalkowski, H.Witala - Phys.Rev. C25, 2403 (1982).

REFERENCES FOR A=17(CONTINUED)

Energy Dependence of ^{9}Be + ^{12}C Cross Sections: Resonances or fluctuations.

1982Ku14 J.A.Kuehner, R.H.Spear, W.J.Vermeer, M.T.Esat, A.M.Baxter, S.Hinds - Phys.Lett. 115B, 437 (1982).
A Measurement of the Giant-Dipole-Resonance Contribution to the Coulomb Excitation of ^{17}O.

1982Mc01 R.J.McCarthy, J.P.Vary - Phys.Rev. C25, 73 (1982).
Higher Order Effects on the Magnetic Form Factor of ^{17}O.

1982Ol01 J.W.Olness, E.K.Warburton, D.E.Alburger, C.J.Lister, D.J.Millener - Nucl.Phys. A373, 13 (1982).
The Beta Decay of ^{18}N and T = 2 States of Mass 18.

1982RaZX C.Rangacharyulu, D.Bender, E.J.Ansaldo, A.Richter, H.D.Graef, G.Kuechler - Bull.Am.Phys.Soc. 27, No.4, 493, DXa10 (1982).
Electro Excitation of T = 3/2 Levels in ^{17}O.

1982Sh06 J.R.Shepard, E.Rost - Phys.Rev. C25, 2660 (1982).
Analytic Eikonal Model for Intermediate Energy Stripping and Pickup Reactions.

1982Ta23 S.L.Tabor, L.C.Dennis, K.Abdo - Nucl.Phys. A391, 458 (1982).
Projectile Breakup and Total Reaction Strengths in Li-Induced Reactions.

1982Th02 I.J.Thompson - Phys.Scr. 25, 475 (1982).
Non-Orthogonality Effects in Quasi-Elastic Reactions.

1982Th06 I.J.Thompson - J.Phys.(London) G8, 937 (1982).
Non-Orthogonality Overlaps I: Deuteron transfer reactions.

1983BlZX C.L.Blilie, D.H.Gay, D.B.Holtkamp, D.Dehnhard, S.J.Seestrom-Morris, C.L.Morris - Bull.Am.Phys.Soc. 28, No.4, 719, GG10 (1983).
Inelastic Scattering of π^+ and π^- from ^{17}O at T_π = 164MeV.

1983Bu08 S.Burzynski, M.Baumgartner, H.P.Gubler, J.Jourdan, H.O.Meyer, G.R.Plattner, H.W.Roser, I.Sick, K.-H.Mobius - Nucl.Phys. A399, 230 (1983).
Accurate Determination of the ^{17}O-^{16}O + n Coupling Constant andSpectroscopic Factor.

1983Cu02 A.Cunsolo, A.Foti, G.Imme, G.Pappalardo, G.Raciti, N.Saunier - Phys.Lett. 124B, 439 (1983).
Evidence for 3p-2h Rotational Bands in ^{17}O.

1983Cu04 A.Cunsolo, A.Foti, G.Imme, G.Pappalardo, G.Raciti, N.Saunier - Lett.Nuovo Cim. 38, 87 (1983).
^{17}O-^{17}N Analog States via the $^{14}C(^{6}Li,t)$ and $^{14}C(^{6}Li,^{3}He)$ Reactions.

1983Da22 J.H.Dave, C.R.Gould - Phys.Rev. C28, 2212 (1983).
Optical Model Analysis of Scattering of 7^- to 15-MeV Neutrons from 1-p Shell Nuclei.

1983Go27 V.G.Gonchar, V.V.Tokarevsky - Izv.Akad.Nauk SSSR, Ser.Fiz. 47, 2156 (1983).
Features of α-Particle Elastic Scattering by Even-Even and Odd Nuclei.

1983HaZX J.J.Hamill - Diss.Abst.Int. 43B, 2250 (1983).
Three-Nucleon Stripping to the Mass-Sixteen System.

1983Ic01 M.Ichimura, M.Kawai - Prog.Theor.Phys.(Kyoto) 69, 128 (1983).
Bare Potential DWBA for (d,p) Reactions.

1983IsZW M.S.Islam, R.W.Finlay, A.S.Meigooni, J.S.Petler, S.Mellema, C.E.Brient, J.R.M.Annand - Bull.Am.Phys.Soc. 28, No.7, 984, CD9 (1983).
Elastic and Inelastic Scattering of Neutrons from ^{16}O.

1983Ja09 L.Jarczyk, B.Kamys, Z.Rudy, A.Strzalkowski, H.Witala, M.Hugi, J.Lang,R.Muller, J.Sromicki, H.H.Wolter - Phys.Rev. C28, 700 (1983).
Energy Dependence of ^{9}Be + ^{12}C Cross Sections: Nonstatistical component of the mean cross section.

1983Le03 P.M.Lewis, A.K.Basak, J.D.Brown, P.V.Drumm, O.Karban, E.C.Pollacco, S.Roman - Nucl.Phys. A395, 204 (1983).
The Elastic and Inelastic Scattering of 33 MeV Polarized ^{3}He from Oxygen and Iron Isotopes.

1983Li10 J.S.Lilley, B.R.Fulton, D.Banes, T.M.Cormier, I.J.Thompson, S.Landowne, H.H.Wolter - Phys.Lett. 128B, 153 (1983).
Excitation of ^{17}O and ^{18}O Scattered by ^{208}Pb in the Coulomb-Nuclear Interference Region.

1983Ma38 H.A.Mavromatis, M.A.Jadid - Nucl.Phys. A403, 77 (1983).
Coulomb Effects on Energy Differences and Radii of Closed Shell ±1 Systems.

1983Me18 A.C.Merchant - Phys.Lett. 130B, 241 (1983).
Potential Model Treatment of ^{3}He Cluster States in ^{17}O.

1983Os08 A.Osman, S.A.Saleh - Acta Phys.Acad.Sci.Hung. 54, 25 (1983).
Heavy Ion Reactions with Single Neutron Transfer.

1983Ra27 C.Rangacharyulu, E.J.Ansaldo, D.Bender, A.Richter, E.Spamer - Nucl.Phys. A406, 493 (1983).
High-Resolution (e,e′) Study of Isovector M1 and M2 Transitions in the Oxygen Isotopes (II). ^{17}O.

1983Ra29 C.Rangacharyulu, M.B.Chatterjee, C.Pruneau, C.St-Pierre - Can.J.Phys. 61, 1486 (1983).
Electric Dipole Transitions from the 11.08 and 9.15 MeV Levels in ^{17}O.

1983Sa30 D.G.Sargood - Aust.J.Phys. 36, 583 (1983).
Effect of Excited States on Thermonuclear Reaction Rates.

1983Sh15 R.Shyam, M.A.Nagarajan - J.Phys.(London) G9, 901 (1983).
Bound-State Shell Model with Full Correction for Spurious Centre-of-Mass Motion.

1983Zi01 W.Zickendraht - Nucl.Phys. A408, 1 (1983).
Unification of the Nuclear Collective and Single-Particle Models; Magnetic dipole and electric quadrupole moments.

REFERENCES FOR A=17(CONTINUED)

1984Bl03 P.G.Blunden, B.Castel - Phys.Lett. 135B, 367 (1984).
The Importance of Meson Exchange Currents, Isobars and Core Polarisation on the Magnetic Form Factor of ^{17}O.

1984Bl17 C.L.Blilie, D.Dehnhard, M.A.Franey, D.H.Gay, D.B.Holtkamp, S.J.Seestrom-Morris, P.J.Ellis, C.L.Morris, D.J.Millener - Phys.Rev. C30, 1989 (1984).
Isospin Structure of Transitions in ^{17}O from Inelastic Pion Scattering at 164 MeV.

1984BlZW P.D.Blunden - Diss.Abst.Int. 45B, 1508 (1984).
Mesonic and Nuclear Effects in Spin Excitations.

1984Bo11 A.Bouyssy, S.Marcos, J.F.Mathiot - Nucl.Phys. A415, 497 (1984).
Single-Particle Magnetic Moments in a Relativistic Shell Model.

1984Ca39 G.Cardella, A.Cunsolo, A.Foti, G.Imme, G.Pappalardo, G.Raciti, F.Rizzo, N.Saunier - Lett.Nuovo Cim. 41, 429 (1984).
Unexpected Behaviour of the Angular-Correlation Function between Deuterons and Alpha-Particles Emitted in the $^{13}C(^{6}Li,d\alpha)$ Reaction at 34 MeV Incident Energy.

1984Da17 B.Dasmahapatra, B.Cujec, F.Lahlou - Nucl.Phys. A427, 186 (1984).
Total Reaction and Transfer Cross Sections for $^{11}B + {}^{9}Be$ and $^{13}C + {}^{9}Be$ Reactions at Low Energies.

1984Et01 M.C.Etchegoyen, A.Etchegoyen, E.Blemont Moreno - J.Phys.(London) G10, 823 (1984).
Three-Particle Transfer on ^{14}N.

1984In01 H.Ing, R.C.McCall, T.M.Jenkins, G.J.Warren - Nucl.Instrum.Methods 219, 41 (1984).
Identification of Neutrons from the Cooling Water of a GeV Electron Accelerator.

1984IsZZ M.S.Islam, J.S.Petler, R.W.Finlay - Bull.Am.Phys.Soc. 29, No.7, 1037, BD6 (1984).
Coupled-Channel Analysis of Neutron Scattering from ^{16}O.

1984Sh30 V.R.Shaginyan - Yad.Fiz. 40, 1144 (1984).
On Coulomb Correlation Energy Effect on Characteristics of Atomic Nuclei.

1984YaZS M.Yasue, T.Tanabe, S.Kubono, M.Sugitani, T.Murakami, J.Kokame, A.Sakaguchi, K.Haga, J.Kasagi - Inst.Nucl.Study, Univ.Tokyo, Ann.Rept., 1983, p.24 (1984).
Single Particle Strength in A = 17 Nuclei via the (α,t) and $(\alpha,{}^{3}He)$ Reaction on ^{16}O.

1984Zi04 W.Zickendraht - Phys.Rev. C30, 2067 (1984).
Theory for the Unification of the Nuclear Collective and Single Particle Models.

1985AnZX Anli Li, C.R.Howell, R.K.Murphy, H.G.Pfutzner, M.L.Roberts, R.L.Walter - Bull.Am.Phys.Soc. 30, No.4, 797, IG11 (1985).
Analyzing Powers for Elastic Neutron Scattering from ^{14}N and ^{16}O.

1985Be37 C.Beck, R.M.Freeman, F.Haas, B.Heusch, J.J.Kolata - Nucl.Phys. A443, 157 (1985).
Role of the Valence Neutron in the $^{12}C + {}^{17}O$ and $^{13}C + {}^{16}O$ Collisions.

1985Bl20 P.G.Blunden, B.Castel - Nucl.Phys. A445, 742 (1985).
The Magnetic Form Factors of ^{15}N,^{17}O and ^{39}K.

1985JoZZ P.L.Jolivette, M.J.Honkanen, M.Young, E.Moser - Bull.Am.Phys.Soc. 30, No.8, 1248, AC7 (1985).
Low Energy $^{16}O + d$ Reactions – Isospin Mixed States.

1985Ju02 J.W.Jury, J.D.Watson, D.Rowley, T.W.Phillips, J.G.Woodworth - Phys.Rev. C32, 1817 (1985).
Ground State Photoneutron Reactions in ^{17}O.

1985KiZY E.J.Kim - Bull.Am.Phys.Soc. 30, No.8, 1259, BD3 (1985).
Electron-Nucleus Scattering at High Q.

1985Ko16 V.N.Kononov, E.D.Poletaev, M.V.Bohovko, L.E.Kazakov, V.M.Timokhov, P.P.Dyachenko, L.S.Kutsaeva, E.A.Seregina, A.Lajtai, J.Kecskemeti - Nucl.Instrum.Methods 236, 361 (1985).
Neutron Detection Efficiency of a Thick Lithium Glass Detector.

1985La13 S.T.Lam, W.K.Dawson, S.A.Elbakr, H.W.Fielding, P.W.Green, R.L.Helmer,I.J.van Heerden, A.H.Hussein, S.P.Kwan, G.C.Neilson, T.Otsubo, D.M.Sheppard, H.S.Sherif, J.Soukup - Phys.Rev. C32, 76 (1985).
Elastic Scattering of Polarized Neutrons on ^{16}O,^{59}Co, and Pb at23 MeV.

1985MaZX D.M.Manley, B.L.Berman, W.Bertozzi, J.M.Finn, F.W.Hersman, C.Hyde-Wright, M.V.Hynes, J.J.Kelly, M.A.Kovash, S.Kowalski, R.W.Lourie, B.Murdock, B.E.Norum, B.Pugh, C.P.Sargent - Bull.Am.Phys.Soc. 30, No.8, 1248, AC6 (1985).
Evidence for M4 Transitions in ^{17}O and ^{18}O from Electron Scattering.

1985Me06 A.C.Merchant - J.Phys.(London) G11, 527 (1985).
^{14}N-Trinucleon-Cluster States in ^{17}F and ^{17}O.

1985Pe10 J.S.Petler, M.S.Islam, R.W.Finlay, F.S.Dietrich - Phys.Rev. C32, 673 (1985).
Microscopic Optical Model Analysis of Nucleon Scattering from Light Nuclei.

1985RoZV M.C.Rozak - Diss.Abst.Int. 45B, 3542 (1985).
Two-Step Processes in the $^{16}O(d,p)^{17}O$ Reaction.

1985Sh24 R.Sherr, G.Bertsch - Phys.Rev. C32, 1809 (1985).
Coulomb Energy Systematics and the Missing $J(\pi) = (1/2)^{+}$ State in^{9}B.

1985SmZZ M.J.Smithson, D.L.Watson, H.T.Fortune - Bull.Am.Phys.Soc. 30, No.4, 707, AH1 (1985).
The $^{12}C(^{6}Li,p)$ Reaction at $E_{\rm Li}$ = 28 MeV.

1985Zi05 W.Zickendraht - Ann.Phys.(Leipzig) 42, 113 (1985).
Electric Quadrupole and Magnetic Dipole Moments of Mirror Nuclei and Self-Conjugate Nuclei.

REFERENCES FOR A=17(CONTINUED)

1986Aj04 F.Ajzenberg-Selove - Nucl.Phys. A460, 1 (1986).
Energy Levels of Light Nuclei A = 16-17.

1986AnZL M.Anghinolfi, P.Corvisiero, G.Ricco, M.Sanzone, M.Taiuti - Proc.Intern.Nuclear Physics Conference, Harrogate, U.K., p.442 (1986).
Proton and Deuteron Radiative Capture to Compound ^{17}O *and* ^{17}F.

1986Be19 B.Bendyk, L.Jarczyk, B.Kamys, A.Strzalkowski, H.Witala - Phys.Rev. C34, 753 (1986).
Statistical Significance of Forward-Backward Asymmetry of the fluctuating Nuclear Angular Distributions.

1986Be36 J.Benisz - Acta Phys.Pol. B17, 735 (1986).
Excess and Hole 4N-Nuclei.

1986Ca27 M.Carchidi, B.H.Wildenthal, B.A.Brown - Phys.Rev. C34, 2280 (1986).
Quadrupole Moments of sd-Shell Nuclei.

1986Cl03 N.M.Clarke, J.Cook - Nucl.Phys. A458, 137 (1986).
Direct and Sequential Processes in the $^{16}O(^{7}Li,^{7}Be)^{16}O$ *Reaction.*

1986Co20 E.D.Cooper, A.Matsuyama - Nucl.Phys. A460, 699 (1986).
The Relativistic Stripping Model of (p,π^{+}) *Reactions in the* Δ *Resonance Region.*

1986Cu02 B.Cujec, B.Dasmahapatra, Q.Haider, F.Lahlou, R.A.Dayras - Nucl.Phys. A453, 505 (1986).
Reactions with ^{9}Be *at Subbarrier Energies.*

1986De10 J.P.Delaroche, M.S.Islam, R.W.Finlay - Phys.Rev. C33, 1826 (1986).
Giant Resonance Coupling and l-Dependent Potentials for ^{16}O.

1986Ed03 J.A.Eden, Y.I.Assafiri - Aust.J.Phys. 39, 871 (1986).
Particle-Hole Description of Dipole States in ^{17}O.

1986FiZY R.W.Finlay, M.S.Islam - Proc.Inter.Conf.on Fast Neutron Physics, Dubrovnik, Yugoslavia, May 26-31, 1986, D.Miljanic, B.Antolkovic, G.Paic, Eds., Ruder Boskovic Institute, Zagreb, p.106 (1986).
Partial Kerma Factors for Elastic and Inelastic Neutron Scattering from Tissue-Abundant Elements.

1986HaZI J.W.Hammer, G.Bulski, W.Grum, K.-W.Hoffmann, G.Keilbach, G.Schleussner, G.Schreder - Proc.Inter.Conf.on Fast Neutron Physics, Dubrovnik, Yugoslavia, May 26-31, 1986, D.Miljanic, B.Antolkovic, G.Paic, Eds., Ruder Boskovic Institute, Zagreb, p.224 (1986).
The Stuttgart ‘ SCORPION ‘ Facility for Scattering Experiments with Fast Polarized Neutrons in the Energy Range of 7 to 8 MeV.

1986IsZW M.S.Islam - Diss.Abst.Int. 47B, 2039 (1986).
Elastic and Inelastic Scattering of Nucleons from ^{16}O.

1986IsZZ M.S.Islam, R.W.Finlay, J.P.Delaroche - Bull.Am.Phys.Soc. 31, No.4, 854, HH7 (1986).
Effects of Giant Resonance Coupling on the Elastic and Inelastic Scattering of Nucleons from ^{16}O.

1986KaZZ N.Kalantar-Nayestanaki, H.Baghaei, W.Bertozzi, S.Dixit, C.Hyde-Wright, S.Kowalski, R.W.Lourie, C.P.Sargent, P.Ulmer, L.Weinstein, J.M.Finn, M.V.Hynes, B.L.Berman - Bull.Am.Phys.Soc. 31, No.4, 876, JJ7 (1986).
Magnetic Structure of ^{17}O *at High Momentum.*

1986Ki10 E.-J.Kim - Phys.Lett. 174B, 233 (1986).
Electron-Nucleus Scattering at High Q.

1986Kw03 E.Kwasniewicz, L.Jarczyk - J.Phys.(London) G12, 697 (1986).
α*-Particle Spectroscopic Amplitudes for Excited States of 1p-Shell Nuclei.*

1986Ma48 D.M.Manley, B.L.Berman, W.Bertozzi, J.M.Finn, F.W.Hersman, C.E.Hyde-Wright, M.V.Hynes, J.J.Kelly, M.A.Kovash, S.Kowalski, R.W.Lourie, B.Murdock, B.E.Norum, B.Pugh, C.P.Sargent - Phys.Rev. C34, 1214 (1986).
Electroexcitation of M4 Transitions in ^{17}O *and* ^{18}O.

1986MaZW D.M.Manley, B.L.Berman, W.Bertozzi, J.M.Finn, F.W.Hersman, C.Hyde-Wright, M.V.Hynes, J.Kelly, M.A.Kovash, S.Kowalski, R.W.Lourie, B.Murdock, B.E.Norum, B.Pugh, C.P.Sargent - Bull.Am.Phys.Soc. 31, No.4, 877, JJ12 (1986).
Inelastic Electron Scattering from ^{17}O *and* ^{18}O.

1986Pa10 C.T.Papadopoulos, R.Vlastou, E.N.Gazis, P.A.Assimakopoulos, C.A.Kalfas, S.Kossionides, A.C.Xenoulis - Phys.Rev. C34, 196 (1986).
Fusion Cross Section of the $^{16}O + ^{13}C$ *Reaction.*

1986Sa41 J.A.Sawicki, J.A.Davies, T.E.Jackman - Nucl.Instrum.Methods Phys.Res. B 15, 530 (1986).
Absolute calibration of the $^{15}N(d,\alpha_{0})^{13}C$ *reaction cross sections.*

1986Sh33 K.Shibata, Y.Kikuchi - Radiat.Eff. 96, 243 (1986).
Evaluation of Nuclear Data for Fusion Neutronics.

1986Sm10 M.J.Smithson, D.L.Watson, H.T.Fortune - J.Phys.(London) G12, 985 (1986).
A Study of the $^{12}C(^{6}Li,p)^{17}O$ *Reaction at E = 28 MeV.*

1986To13 M.Tomaselli, F.Beck, A.Richter - Nucl.Phys. A459, 279 (1986).
Isovector Magnetic Quadrupole Strengths in ^{17}O.

1986Ze04 N.S.Zelenskaya, A.K.Morzabaev - Izv.Akad.Nauk SSSR, Ser.Fiz. 50, 1840 (1986); Bull.Acad.Sci.USSR, Phys.Ser. 550, No.9, 170 (1986).
Elastic Scattering of ^{3}He *Ions by Carbon Isotopes.*

1987Ab03 H.Abele, H.J.Hauser, A.Korber, W.Leitner, R.Neu, H.Plappert, T.Rohwer, G.Staudt, M.Strasser, S.Welte, M.Walz, P.D.Eversheim, F.Hinterberger - Z.Phys. A326, 373 (1987).

REFERENCES FOR A=17(CONTINUED)

Measurement and Folding-Potential Analysis of the Elastic α-Scattering on Light Nuclei.
1987Ar13 A.E.Aravantinos, A.C.Xenoulis - Phys.Rev. C35, 1746 (1987).
Reaction Mechanism of pn and d Emission in Certain Heavy-Ion-Induced Nuclear Reactions.
1987AzZZ S.M.Aziz, A.D.Bacher, L.C.Bland, G.T.Emery, W.W.Jacobs, E.Korkmaz, H.Nann, P.W.Park, J.Templon, P.L.Walden, G.M.Huber - Bull.Am.Phys.Soc. 32, No.4, 1062, EG7 (1987).
Highly Excited States in ^{17}O,^{15}N and ^{16}N Populated in the (p,π^+) Reaction.
1987Ca30 G.Cardella, A.Cunsolo, A.Foti, G.Imme, G.Pappalardo, G.Raciti, F.Rizzo, N.Alamanos, B.Berthier, N.Saunier - Phys.Rev. C36, 2403 (1987).
Interference Effects between ^{17}O States Populated in the $^{13}C(^6Li,d)^{17}O(*) \rightarrow \alpha + {}^{13}C$ Reaction.
1987Co07 J.Cook - Nucl.Phys. A465, 207 (1987).
Microscopic Spin-Orbit Potentials for Polarized ^3He Elastic Scattering.
1987De38 P.Descouvemont - Phys.Rev. C36, 2206 (1987).
Microscopic Analysis of the $^{13}C(\alpha,n)^{16}O$ and $^{13}C(\alpha,\alpha)^{13}C$ Reactions.
1987Fu06 R.J.Furnstahl, B.D.Serot - Nucl.Phys. A468, 539 (1987).
Nuclear Currents in a Relativistic Mean-Field Theory.
1987HuZY G.M.Huber, G.J.Lolos, K.H.Hicks, P.L.Walden, S.Yen, R.D.Bent, G.T.Emery, E.G.Auld, F.Duncan, W.R.Falk - Phys.Can. 43, No.3, p.62, FE8 (1987).
Proton Induced Exclusive Pion Production from ^{16}O at Intermedite Energies.
1987Im03 B.Imanishi, W.von Oertzen - Fizika(Zagreb) 19, Supplement 1, 17 (1987).
Rotational Coupling Effects on the Nucleon Molecular Orbitals in the Scattering $^{17}O(^{16}O,^{16}O)^{17}O*(0.87MeV,(1/2)^+)$.
1987Is03 F.Iseki, K.-I.Kubo, H.Toki - Phys.Rev. C35, 1037 (1987).
Cascade Model Calculations of p(bar) + $^{12}C \rightarrow$ n(bar) + X at 590 MeV/c.
1987Is04 M.S.Islam, R.W.Finlay, J.S.Petler - Nucl.Phys. A464, 395 (1987).
Elastic and Inelastic Scattering of Nucleons from ^{16}O.
1987It01 H.Ito, L.S.Kisslinger - Ann.Phys.(New York) 174, 169 (1987).
Nuclear Magnetic Moments in the Hybrid Quark-Hadron Model.
1987Ki01 K.H.Kim, M.H.Park, B.T.Kim - Phys.Rev. C35, 363 (1987).
Radiative Capture Reaction $^7Be(p,\gamma)^8B$ at Low Energies.
1987Le29 G.Levai, J.Cseh - ATOMKI Kozlem. 29, 71 (1987).
Parameters of Resonances in Elastic Alpha-Scattering.
1987Ma22 E.Maglione, G.Pollarolo, A.Vitturi, R.A.Broglia, A.Winther - Phys.Lett. 191B, 237 (1987).
Semiclassical Analysis of Two-Particle Elastic Transfer.
1987Ma40 D.M.Manley, J.J.Kelly - Phys.Rev. C36, 1646 (1987).
Reply to ' Comment on ' Electroexcitation of M4 Transitions in $^{17}O$and ^{18}O ' '.
1987Ma52 D.M.Manley, B.L.Berman, W.Bertozzi, T.N.Buti, J.M.Finn, F.W.Hersman, C.E.Hyde-Wright, M.V.Hynes, J.J.Kelly, M.A.Kovash, S.Kowalski, R.W.Lourie, B.Murdock, B.E.Norum, B.Pugh, C.P.Sargent - Phys.Rev. C36, 1700 (1987).
High-Resolution Inelastic Electron Scattering from ^{17}O.
1987Mi25 D.J.Millener - Phys.Rev. C36, 1643 (1987).
Comment on ' Electroexcitation of M4 Transitions in ^{17}O and ^{18}O'.
1987MiZY A.Middleton, J.D.Brown, L.Herold, K.E.Luther, M.L.Pitt, D.Barker, H.S.Camarda, S.Aziz - Bull.Am.Phys.Soc. 32, No.8, 1578, EC2 (1987).
The Population of States at High Excitation in the 1p Shell via the (α,p) Reaction.
1987Ro20 T.K.Roy, S.Mukherjee - J.Phys.(London) G13, 1239 (1987).
Deuteron Break-Up Contribution to Stripping and Pick-Up Reactions.
1987SeZL N.Severijns, D.Vandeplassche, E.van Walle, J.Wouters, J.Van Haverbeke, L.Vanneste - Proc.Intern.Conf.Nuclear Structure Through Static and Dynamic Moments, Melbourne, Australia, Vol.1, p.25 (1987).
The Beta-Decay Asymmetry of the Mirror Nuclei ^{15}O,^{17}F and ^{19}Ne, Measured with On-Line Nuclear Orientation.
1987SeZR N.Severijns, D.Vandeplassche, E.van Walle, J.Wouters, J.Van Haverbeke, L.Vanneste - Contrib.Proc. 5th Int.Conf.Nuclei Far from Stability, Rosseau Lake, Canada, J9 (1987).
The Beta-Decay Asymmetry of the Mirror Nuclei ^{15}O,^{17}F and ^{19}Ne,Measured with On-Line Nuclear Orientation.
1988AzZZ S.M.Aziz, G.T.Emery, L.C.Bland, W.W.Jacobs, E.Korkmaz, H.Nann, P.W.Park, J.Templon - Bull.Am.Phys.Soc. 33, No.4, 961, DI4 (1988).
High Spin States in ^{17}O Populated via $^{16}O(p(pol),\pi^+)$ Reaction.
1988BrZY J.D.Brown, A.Middleton, S.M.Aziz - Bull.Am.Phys.Soc. 33, No.4, 1022, GI13 (1988).
High Spin States in Light Nuclei at High Excitation.
1988Co10 P.Corvisiero, M.Anghinolfi, M.M.Giannini, G.Ricco, M.Sanzone, M.Taiuti - Nucl.Phys. A483, 9 (1988).
Proton and Deuteron Radiative Capture in Light Nuclei.
1988Fu04 R.J.Furnstahl - Phys.Rev. C38, 370 (1988).
Convection Currents in Nuclei in a Relativistic Mean-Field Theory.
1988Ho16 U.Hofmann, P.Ring - Phys.Lett. 214B, 307 (1988).
A New Method to Calculate Magnetic Moments in Relativistic Mean FieldTheories.
1988Hu02 G.M.Huber, G.J.Lolos, Z.Papandreou, K.H.Hicks, P.L.Walden, S.Yen, R.D.Bent, G.T.Emery, E.G.Auld, F.A.Duncan, W.R.Falk - Phys.Rev. C37, 215 (1988).

REFERENCES FOR A=17(CONTINUED)

$^{16}O(p(pol),\pi^+)^{17}O(*)$ at Incident Proton Energies of 250,354, and 489 MeV.

1988Hu06 G.M.Huber, G.J.Lolos, K.H.Hicks, P.L.Walden, S.Yen, R.D.Bent, W.R.Falk, E.G.Auld - Phys.Rev. C37, 2051 (1988).
Proton-Induced Inclusive Pion Production from Light Nuclei in the Region of the Δ_{1232} Resonance.

1988Ic01 S.Ichii, W.Bentz, A.Arima, T.Suzuki - Nucl.Phys. A487, 493 (1988).
Nuclear Magnetic Properties in the Relativistic σ-(Omega) Model.

1988Im02 B.Imanishi, S.Misono, W.von Oertzen - Phys.Lett. 210B, 35 (1988).
Strong Rotational Coupling Effects on the Transition $^{17}O(^{16}O,^{16}O)^{17}O(*)(0.87 MeV,(1/2)^+)$ between Nucleon Molecular Orbitals.

1988Ja14 L.Jarczyk, B.Kamys, J.Romanski, A.Strzalkowski, M.Godlewski, J.Lang, R.Muller, J.Smyrski, J.Sromicki, H.H.Wolter - Acta Phys.Pol. B19, 951 (1988).
Study of the Mechanism of the Five-Nucleon Transfer Reaction $^{12}C(^{13}C,^{8}Be)^{17}O$.

1988Ka08 N.Kalantar-Nayestanaki, H.Baghaei, W.Bertozzi, S.Dixit, J.M.Finn, C.E.Hyde-Wright, S.Kowalski, R.W.Lourie, C.P.Sargent, P.E.Ulmer, L.Weinstein, M.V.Hynes, B.L.Berman, J.J.Kelly - Phys.Rev.Lett. 60, 1707 (1988).
Magnetic Structure of ^{17}O at High Momentum.

1988Ke07 K.W.Kemper, G.A.Hall, S.P.Van Verst, J.Cook - Phys.Rev. C38, 2664 (1988).
Failure of Finite-Range Distorted-Wave Born Approximation and Coupled-Channels Born Approximation to Describe $(^{7}Li,^{6}Li)$ Single Particle Transitions.

1988Ki02 H.Kitazawa, M.Igashira - J.Phys.(London) G14, Supplement S215 (1988).
Mechanism of s-Wave and p-Wave Neutron Resonance Capture in Light andMedium-Weight Nuclei.

1988Le05 G.Levai, J.Cseh - J.Phys.(London) G14, 467 (1988).
Distribution of Alpha-Particle Strength in Light Nuclei.

1988MeZX S.Mellema, D.Kadrmas, R.W.Finlay, M.S.Islam, F.S.Dietrich - Bull.Am.Phys.Soc. 33, No.8, 1570, BB3 (1988).
Microscopic DWBA Analysis of Nucleon Scattering from ^{16}O.

1988Se11 N.Severijns, J.Wouters, J.Vanhaverbeke, W.Vanderpoorten, L.Vanneste - Hyperfine Interactions 43, 415 (1988).
First On-Line β-Decay Asymmetry Measurements of Oriented Nuclei.

1988We17 I.Weitzenfelder, N.Bischof, W.Tiereth, H.Voit, W.von Oertzen, H.H.Wolter - Nucl.Phys. A489, 125 (1988).
Molecular Effects in the $^{12}C + ^{13}C$ Exit Channel of the Reaction$^{16}O + ^{9}Be$.

1989Ba60 F.C.Barker, C.L.Woods - Aust.J.Phys. 42, 233 (1989).
Investigation of E1 Strength in Coulomb Excitation of Light Nuclei.

1989Br05 D.J.Brenner, R.E.Prael - At.Data Nucl.Data Tables 41, 71 (1989).
Calculated Differential Secondary-Particle Production Cross Sections After Nonelastic Neutron Interactions with Carbon and Oxygen between 15 and 60 MeV.

1989Ch24 M.Chiapparini, A.O.Gattone - Phys.Lett. 224B, 243 (1989).
Medium Induced Magnetization Current and Nuclear Magnetic Moments.

1989Co04 E.D.Cooper, N.B.de Takacsy - Phys.Lett. 220B, 17 (1989).
Suppression of High Intermediate Momenta in the π-Nucleus Interaction.

1989Er05 S.N.Ershov, F.A.Gareev, R.S.Kurmanov, E.F.Svinareva, G.S.Kazacha, A.S.Demyanova, A.A.Ogloblin, S.A.Goncharov, J.S.Vaagen, J.M.Bang - Phys.Lett. 227B, 315 (1989).
Do Rainbows Observed in Light Ion Scattering Really Pin Down the Optical Potential (Question).

1989Fu05 R.J.Furnstahl, C.E.Price - Phys.Rev. C40, 1398 (1989).
Relativistic Hartree Calculations of Odd-A Nuclei.

1989Ga04 A.O.Gattone, J.P.Vary - Phys.Lett. 219B, 22 (1989).
Relativistic Effects in the Elastic Magnetic Form Factor of ^{17}O.

1989Gu23 I.S.Gurbanovich, V.G.Neudachin, V.A.Romanovsky - Yad.Fiz. 50, 1292 (1989).
Stripping as a Nucleon Multiple Exchange Process.

1989Li26 A.Li, H.G.Pfutzner, C.R.Howell, R.L.Walter - Chin.J.Nucl.Phys. 11, No.3, 1 (1989).
Measurements of Analyzing Power Ay(θ) for Neutron Elastic Scatteringfrom ^{14}N and ^{16}O.

1989Lu03 Y.L.Luo, Y.Iseri, M.Kawai - Prog.Theor.Phys.(Kyoto) 81, 396 (1989).
Bare Potential DWBR in Rearrangement Reactions.

1989Ne02 Y.Nedjadi, J.R.Rook - J.Phys.(London) G15, 589 (1989).
Magnetic Moments in the Relativistic Shell Model.

1989Or07 G.V.O'Rielly, D.Zubanov, M.N.Thompson - Phys.Rev. C40, 59 (1989).
Deexcitation γ Rays following the Photodisintegration of ^{17}O.

1989Ra17 P.Raghavan - At.Data Nucl.Data Tables 42, 189 (1989).
Table of Nuclear Moments.

1989Se07 N.Severijns, J.Wouters, J.Vanhaverbeke, L.Vanneste - Phys.Rev.Lett. 63, 1050 (1989).
β-Decay Aniostropies of the Mirror Nuclei ^{15}O and ^{17}F.

1989Zh04 Z.Zhao, M.Gai, B.J.Lund, S.L.Rugari, D.Mikolas, B.A.Brown, J.A.Nolen,Jr., M.Samuel - Phys.Rev. C39, 1985 (1989).
Beta Decay of ^{18}N to Alpha Particle Emitting States in ^{18}O and a Proposed Search for Parity Violation in ^{18}O.

1990Ca32 H.D.Carstanjen, W.Decker, J.Diehl, Th.Enders, R.M.Emrick, A.Fohl, E.Friedland, D.Plachke, H.Stoll - Nucl.Instrum.Methods Phys.Res. B51, 152 (1990).
High Sensitivity Analysis and Profiling of Oxygen and Nitrogen by a (d,pγ)-Coincidence Technique.

REFERENCES FOR A=17(CONTINUED)

1990De31 A.S.Demyanova, A.A.Ogloblin, S.N.Ershov, F.A.Gareev, R.S.Kurmanov, E.F.Svinareva, S.A.Goncharov, V.V.Adodin, N.Burtebaev, J.M.Bang, J.S.Vaagen - Phys.Scr. T32, 89 (1990).
Rainbows in Nuclear Reactions and the Optical Potential.

1990FuZQ S.Fukuda, Y.Aoki, H.Shiohara, Y.Someda, M.Tanaka, Y.Nakayama, T.Ohtsubo, Y.Nojiri, T.Minamisono - Osaka Univ.Lab.Nucl.Studies, Ann.Rept., 1989, p.59 (1990).
NMR Detection of $^{17}F(I(\pi) = 5/2^+, T_{1/2} = 64.5$ sec) by Use ofAsymmetry β-Decay.

1990Ha38 S.Hara, K.T.Hecht, Y.Suzuki - Prog.Theor.Phys.(Kyoto) 84, 254 (1990).
Alpha Cluster Formation in ^{20}Ne in the Cluster-Orbital Shell Model. I – The ^{16}O + Single Nucleon Problem -.

1990Mc06 K.G.McNeill, J.W.Jury - Phys.Rev. C42, 2234 (1990).
Isospin in $^{17}O(\gamma,n_0)$ Reactions.

1990Mo36 T.M.Morse, C.E.Price, J.R.Shepard - Phys.Lett. 251B, 241 (1990).
Meson Exchange Current Corrections to Magnetic Moments in Quantum Hadro-Dynamics.

1990Mu19 A.M.Mukhamedzhanov, S.A.Goncharov, I.R.Gulamov, V.Kroha, N.K.Timofeyuk - Yad.Fiz. 52, 704 (1990); Sov.J.Nucl.Phys. 52, 452 (1990).
Vertex Form Factors and Overlap Integrals in the Microscopic Approachand Reactions of One-Nucleon Transfer.

1990Ol01 N.Olsson, E.Ramstrom, B.Trostell - Nuxl.Phys. A509, 161 (1990).
Neutron Elastic and Inelastic Scattering from Beryllium,Nitrogen and Oxygen at E(n) = 21.6 MeV.

1990Pi05 S.Piskor, W.Schaferlingova - Nucl.Phys. A510, 301 (1990).
Spectroscopic Information on ^{13,14}C,^{15}N,^{17}O,$^{29-31}$Si,^{33}S,^{38}Cl and ^{111,113,115,117}Cd from the (d,p) Reaction.

1990We10 W.Weiss, W.Grum, J.W.Hammer, M.Koch, G.Schreder - Nucl.Instrum.Methods Phys.Res. A292, 359 (1990).
Polarization Measurement of Fast Neutrons from the $^9Be(\alpha,n)^{12}$Cand the $^{13}C(\alpha,n)^{16}$O Reaction using a High-Pressure ^{4}He-Polarimeter in a New Design.

1991Bl14 P.G.Blunden, E.J.Kim - Nucl.Phys. A531, 461 (1991).
One-Pion Exchange Currents in the QHD Formalism.

1991Bo12 C.Borchert, W.Greiner, A.Thiel, W.Scheid - J.Phys.(London) G17, 691 (1991).
Inelastic Excitation and Nucleon Transfer in the Scattering of ^{17}Oon ^{13}C.

1991Co12 S.A.Coon, L.Jaqua - Phys.Rev. C44, 203 (1991).
Wave Function Effects and the Elastic Magnetic Form Factor of ^{17}O.

1991Le33 J.A.Leavitt, L.C.McIntyre, Jr. - Nucl.Instrum.Methods Phys.Res. B56/57, 734 (1991).
Non-Rutherford ^{4}He Cross Sections for Ion Beam Analysis.

1991Le36 W.N.Lennard, G.R.Massoumi, P.F.A.Alkemade, I.V.Mitchell, S.Y.Tong - Nucl.Instrum.Methods Phys.Res. B 61, 1 (1991).
Revisiting the $^{12}C(d,p)^{13}$C reaction cross section using condensed gas targets.

1991Ma36 V.S.Mathur, P.Padhy - Pramana 36, 565 (1991).
Three-Body Formalism for Deuteron Stripping Reactions.

1991MaZL K.Matsuda, T.Araki, K.Mashitani, E.Takahashi, M.Tanigaki, T.Ohtsubo, Y.Nakayama, H.Shiohara, T.Someta, M.Tanaka, A.Kitagawa, M.Fukuda, K.Matsuta, Y.Nojiri, T.Minamisono - Osaka Univ.Lab.Nucl.Studies, Ann.Rept., 1990, p.72 (1991).
Precise Measurement of the Magnetic Moment of $^{17}F(I(\pi) = 5/2^+, T_{1/2} = 64.5s)$.

1991Pi09 C.N.Pinder, C.O.Blyth, N.M.Clarke, D.Barker, J.B.A.England, B.R.Fulton, O.Karban, M.C.Mannion, J.M.Nelson, C.A.Ogilvie, L.Zybert, R.Zybert, K.I.Pearce, P.J.Simmonds, D.L.Watson - Nucl.Phys. A533, 25 (1991).
Consistent Description of the (t,^{3}He) Reaction for A = 12-89.

1991Re02 P.L.Reeder, R.A.Warner, W.K.Hensley, D.J.Vieira, J.M.Wouters - Phys.Rev. C44, 1435 (1991).
Half-Lives and Delayed Neutron Emission Probabilities of Neutron-RichLi-Al Nuclides.

1991Re10 G.Reffo, M.H.MacGregor, T.Komoto - Nucl.Instrum.Methods Phys.Res. A307, 380 (1991).
Fast-Neutron-Induced Cross Sections on ^{20}Ne.

1991Sk02 L.D.Skouras, H.Muther - Nucl.Phys. A534, 128 (1991).
Effective Transition Operators in the sd Shell.

1991Zh06 J.-K.Zhang, D.S.Onley - Nucl.Phys. A526, 245 (1991).
Relativistic Hartree Study of Deformed Nuclei.

1992Ar08 H.Artigalas, A.Chevarier, N.Chevarier, M.El Bouanani, E.Gerlic, N.Moncoffre, B.Roux, M.Stern, J.Tousset - Nucl.Instrum.Methods Phys.Res. B66, 237 (1992).
Nitrogen Profiling in Nitride Films and Nitrogen-Implanted Samples using the $^{14}N(\alpha,\alpha)$ and $^{14}N(\alpha,p)$ Reactions at 6 MeV Incident Energy.

1992Ba50 D.Baye, N.K.Timofeyuk - Phys.Lett. 293B, 13 (1992).
Vertex Constants and the Problem of the Nucleon-Nucleon Potential in the Generator Coordinate Method.

1992Be37 R.D.Bent, P.W.F.Alons, M.Dillig - Nucl.Phys. A548, 637 (1992).
Role of the δ-Isobar in the $A(p,\pi)A + 1$ Reaction.

1992Br05 C.R.Brune, R.W.Kavanagh - Phys.Rev. C45, 1382 (1992).
Total Cross Sections and Thermonuclear Reaction Rates for ^{13}C(d,n)and ^{14}C(d,n).

1992Ga26 F.A.Gareev, V.I.Zagrebaev, D.N.Semkin - Bull.Rus.Acad.Sci.Phys. 56, 784 (1992).
Semiclassical Analysis of Light Ion Elastic Scattering: Complex Trajectories and Caustics.

1992Go07 A.Gokalp, O.Yilmaz - Nuovo Cim. 105A, 695 (1992).

REFERENCES FOR A=17(CONTINUED)

Core Polarization Effects on the Magnetic Form Factors of ^{15}N and ^{17}O.

1992He12 E.M.Henley, I.B.Khriplovich - Phys.Lett. 289B, 223 (1992).
First Forbidden β-Decays as a Probe of T-Odd Nuclear Forces.

1992Ig01 M.Igashira, H.Kitazawa, K.Takaura - Nucl.Phys. A536, 285 (1992).
Valence-Neutron Capture in the 434 keV $p_{3/2}$-Wave Resonance of ^{16}O.

1992Ja13 L.Jaqua, M.A.Hasan, J.P.Vary, B.R.Barrett - Phys.Rev. C46, 2333 (1992).
Kinetic-Energy Operator in the Effective Shell-Model Interaction.

1992La08 D.W.Lane - Nucl.Instrum.Methods Phys.Res. B64, 448 (1992).
The Ion Beam Analysis of Laser-Irradiated Borosilicate Glass.

1992Ma47 A.Mader, J.D.Meyer, K.Bethge - Nucl.Instrum.Methods Phys.Res. B71, 65 (1992).
Modifications of the Gallium Arsenide Crystal Surface during Annealing.

1992MaZM V.S.Mathur - Contrib.13th Int.Conf. on Few-Body Problems in Physics, Adelaide, Australia, January 5-11, 1992, I.R.Afnan, R.T.Cahill, Eds., p.96 (1992).
Three-Body Approach to Transfer Reactions.

1992Mi13 T.Minamisono, T.Ohtsubo, Y.Nakayama, T.Araki, K.Mashitani, K.Matsuda,E.Takahashi, M.Tanigaki, Y.Someda, M.Tanaka, A.Kitagawa, M.Fukuda, K.Matsuta, Y.Nojiri - Hyperfine Interactions 73, 347 (1992).
Precise Measurement of the Magnetic Moment of $^{17}F(I(\pi) = (5/2)^+, T_{1/2} = 64.5$ s) and Its Hyperfine Interactions in Ionic Crystals.

1992Qi02 H.Qi, G.Chen, Y.Chen, Q.Chen, Z.Chen, Z.Chen - Chin.J.Nucl.Phys. 14, No 1, 15 (1992).
The Small Angle Scattering Cross Sections of 14.8 MeV Neutrons from ^{27}Al and ^{16}O.

1992Su02 T.Suzuki, H.Sagawa, A.Arima - Nucl.Phys. A536, 141 (1992).
Effects of Valence Nucleon Orbits and Charge Symmetry Breaking Interaction on the Nolen-Schiffer Anomaly of Mirror Nuclei.

1992Ya08 M.Yasue, T.Hasegawa, S.I.Hayakawa, K.Ieki, J.Kasagi, S.Kubono, T.Murakami, K.Nisimura, K.Ogawa, H.Ohnuma, R.J.Peterson, H.Shimizu, M.H.Tanaka, H.Toyokawa - Phys.Rev. C46, 1242 (1992).
Spectroscopic Study of Oxygen and Fluorine Isotopes with the (α,^{3}He) and (α,t) Reactions on $^{16,17,18}O$.

1992Zh07 D.C.Zheng, D.W.L.Sprung, L.Zamick - Nucl.Phys. A540, 57 (1992).
The Magnetic Moments and Form Factors of ^{17}O and ^{41}Ca.

1992Zu01 D.Zubanov, M.N.Thompson, B.L.Berman, J.W.Jury, R.E.Pywell, K.G.McNeill - Phys.Rev. C45, 174 (1992); Erratum Phys.Rev. C46, 1147 (1992).
Giant Dipole Resonance in ^{17}O Observed with the (γ,p) Reaction.

1993AtZZ U.Atzrott, R.Neu, C.Striebel, F.Hoyler, H.Abele, G.Staudt - Proc.Int.Conf.Nuclear Structure and Nuclear Reactions at Low and Intermediate Energies, Dubna, p.26 (1993); JINR E4-93-58 (1993).
Collective Excitations of p- and sd-Shell Nuclei Using Inelastic α-Scattering.

1993Br17 C.R.Brune, I.Licot, R.W.Kavanagh - Phys.Rev. C48, 3119 (1993).
Low-Energy Resonances in $^{13}C(\alpha,n)$.

1993Bu21 L.Buchmann, R.E.Azuma, C.A.Barnes, J.M.D′Auria, M.Dombsky, U.Giesen, K.P.Jackson, J.D.King, R.Korteling, P.McNeely, J.Powell, G.Roy, J.Vincent, S.S.M.Wong, P.R.Wrean - Nucl.Instrum.Methods Phys.Res. B79, 330 (1993).
A Study of Beta Delayed Alpha Emission from ^{16}N.

1993Dr08 H.W.Drotleff, A.Denker, H.Knee, M.Soine, G.Wolf, J.W.Hammer, U.Greife, C.Rolfs, H.P.Trautvetter - Astrophys.J. 414, 735 (1993).
Reaction Rates of the s-Process Neutron Sources $^{22}Ne(\alpha,n)^{25}Mg$ and $^{13}C(\alpha,n)^{16}O$.

1993DrZZ H.W.Drotleff, A.Denker, H.Knee, M.Soine, G.Wolf, J.W.Hammer, U.Greife, C.Rolfs, H.P.Trautvetter - Proc.2nd Intern.Symposium on Nuclear Astrophysics, Nuclei in the Cosmos, Karlsruhe, Germany, 6-10 July, 1992, F.Kappeler, K.Wisshak, Eds., IOP Publishing Ltd., Bristol, England, p.197 (1993).
Investigation of Neutron Producing (α,n)-Reactions Relevant for the Astrophysical s- and r-Process.

1993Gu04 I.S.Gurbanovich, V.G.Neudachin, E.A.Romanovsky - Yad.Fiz. 56, No 1, 93 (1993); Phys.Atomic Nuclei 56, 54 (1993).
Stripping Reaction as a Process of Multiple Nucleon Exchange. Polarization Data.

1993Ki05 H.Kitagawa, H.Sagawa - Phys.Lett. 299B, 1 (1993).
Quadrupole-Moments in Mirror Nuclei and Proton Halo.

1993Ki22 H.Kitagawa, H.Sagawa - Hyperfine Interactions 78, 175 (1993).
Q-Moment and Nuclear Radius in Light Mirror Nuclei.

1993La31 H.Laurent, H.Lefort, D.Beaumel, Y.Blumenfeld, S.Fortier, S.Gales, J.Guillot, J.C.Roynette, P.Volkov, S.Brandenburg - Nucl.Instrum.Methods Phys.Res. A326, 517 (1993).
EDEN: A neutron time-of-flight multidetector for decay studies of giant states.

1993Mc02 K.G.McNeill, M.N.Thompson, A.D.Bates, J.W.Jury, B.L.Berman - Phys.Rev. C47, 1108 (1993).
Isospin Effects in the Photodisintegration of Light Nuclei.

1993Mi33 T.Minamisono, T.Ohtsubo, S.Fukuda, Y.Nakayama, T.Araki, K.Mashitani, K.Matsuda, E.Takahashi, M.Tanigaki, M.Tanaka, H.Shiohara, Y.Someda, Y.Aoki, A.Kitagawa, M.Fukuda, K.Matsuta, Y.Nojiri - Hyperfine Interactions 78, 111 (1993).
Precise Measurement of the Magnetic Moment of Doubly Closed Shell+1 Nucleon Nucleus $^{17}F(I(\pi) = (5/2)^+, T_{1/2} = 64.5s)$.

1993Po11 N.A.F.M.Poppelier, A.A.Wolters, P.W.M.Glaudemans - Z.Phys. A346, 11 (1993).
Properties of Exotic Light Nuclei.

1993Qu04 V.Quillet, F.Abel, M.Schott - Nucl.Instrum.Methods Phys.Res. B83, 47 (1993).

REFERENCES FOR A=17(CONTINUED)

Absolute Cross Section Measurements for H and D Elastic Recoil using 1 to 25 MeV ^{4}He Ions, and for the ^{12}C(d,p)^{13}C and ^{16}O(d,p$_1$)^{17}O Nuclear Reactions.

1993ReZX P.L.Reeder, H.S.Miley, W.K.Hensley, R.A.Warner, H.L.Seifert, D.J.Vieira, J.M.Wouters, Z.Y.Zhou - Proc.6th Intern.Conf.on Nuclei Far from Stability + 9th Intern.Conf.on Atomic Masses and Fundamental Constants, Bernkastel-Kues, Germany, 19-24 July, 1992, R.Neugart, A.Wohr, Eds., p.623 (1993).
Average Energy of Delayed Neutron Spectra: A = 9-20.

1993ShZW B.M.Sherrill, S.A.Austin, D.Bazin, W.Benenson, Y.Chen, R.Harkewicz, E.Kashy, J.H.Kelley, R.A.Kryger, M.F.Mohar, D.J.Morrissey, N.A.Orr, G.A.Souliotis, M.Steiner, M.Thoennessen, J.S.Winfield, J.A.Winger, S.J.Yennello, B.M.Young - Proc.6th Intern.Conf.on Nuclei Far from Stability + 9th Intern.Conf.on Atomic Masses and Fundamental Constants, Bernkastel-Kues, Germany, 19-24 July, 1992, R.Neugart, A.Wohr, Eds., p.891 (1993).
Studies of Nuclei Far from Stability using Radioactive Beams at the NSCL.

1993Ti03 J.Timar, T.X.Quang, T.Fenyes, Zs.Dombradi, A.Krasznahorkay, J.Kumpulainen, R.Julin - Nucl.Phys. A552, 149 (1993).
Level Scheme of ^{68}Ga from (p,nγ) Reaction.

1993Ti07 D.R.Tilley, H.R.Weller, C.M.Cheves - Nucl.Phys. A564, 1 (1993).
Energy Levels of Light Nuclei A = 16-17.

1994Am01 J.E.Amaro, C.Garcia-Recio, A.M.Lallena - Nucl.Phys. A567, 701 (1994).
Meson-Exchange Current Effects in Elastic Electron Scattering from Polarized Nuclei.

1994Do08 M.Dombsky, L.Buchmann, J.M.D′Auria, U.Giesen, K.P.Jackson, J.D.King, E.Korkmaz, R.G.Korteling, P.McNeely, J.Powell, G.Roy, M.Trinczek, J.Vincent - Phys.Rev. C49, 1867 (1994).
β-Delayed α Decay of ^{17}N.

1994Gi14 G.Giorginis, P.Misaelides, M.Conti - Nucl.Instrum.Methods Phys.Res. B89, 100 (1994).
Characterization of Boron Nitride Thin Films using (α,p) Nuclear Reactions.

1994Hu21 Z.-D.Huang, L.-H.Zhu, L.Hou, D.-Z.Ding - Chin.J.Nucl.Phys. 16, No 3, 270 (1994).
The Measurement of ^{16}O(n,γ)^{17}O Reaction at the Pygmy ResonanceRegion.

1994Iv01 E.A.Ivanov, D.Plostinaru, G.Nicolescu, A.Ivan - Nucl.Instrum.Methods Phys.Res. B85, 293 (1994).
Simultaneous Microanalysis of Nitrogen and Oxygen on Silicon using NRA with a Cyclotron.

1994Le19 W.N.Lennard, G.R.Massoumi, I.V.Mitchell, H.T.Tang, D.F.Mitchell, J.A.Bardwell - Nucl.Instrum.Methods Phys.Res. B85, 42 (1994).
Measurements of Thin Oxide Films of SiO_2/Si(100).

1994Li55 L.Liu - Chin.J.Nucl.Phys. 16, No 1, 45 (1994).
Nuclear Bag Model and Nuclear Magnetic Moments.

1994Lo25 R.Loveman, T.Gozani, J.Bendahan, J.Krivicich, E.Elias, E.Altschuler - Nucl.Instrum.Methods Phys.Res. A353, 508 (1994).
Utilization of a BGO Detector as an Active Oxygen Target.

1994Ma34 E.Maglione, L.S.Ferreira - Phys.Rev. C50, 1240 (1994).
Single Particle Energies in ^{17}O with the Bonn Potential.

1994Mo18 R.Moreh, O.Beck, U.Kneissl, J.Margraf, H.Maser, H.H.Pitz, R.-D.Herzberg, N.Pietralla, A.Zilges - Phys.Rev. C50, 2222 (1994).
Width of the 3841-keV Level in ^{17}O.

1994Mo19 S.Moraghe, J.E.Amaro, C.Garcia-Recio, A.M.Lallena - Nucl.Phys. A576, 553 (1994).
Meson-Exchange Current Effects in Inelastic Electron Scattering from Polarized Nuclei.

1994NaZT Y.Nagai, M.Igashira, T.Shima, K.Masuda, T.Ohsaki, H.Kitazawa - Proc.Nuclei in the Cosmos III, Assergi, Italy, p.201 (1994); AIP Conf. Proc 327 (1994).
Is ^{16}O a strong neutron poison?.

1994ReZZ P.L.Reeder, Y.Kim, W.K.Hensley, H.S.Miley, R.A.Warner, D.J.Vieira, J.M.Wouters, Z.Y.Zhou, H.L.Seifert - Proc.Intern.Conf.Nuclear Data for Science and Technology, Gatlinburg,Tennesse, 9-13 May, 1994, J.K.Dickens, Ed., American Nuclear Society, Vol.1, p.324 (1994).
Beta decay data for neutron-rich li-Cl nuclides.

1994Sa45 K.Saito, A.W.Thomas - Phys.Lett. 335B, 17 (1994).
The Nolen-Schiffer Anomaly and Isospin Symmetry Breaking in Nuclear Matter.

1994Sc01 K.W.Scheller, J.Gorres, J.G.Ross, M.Wiescher, R.Harkewicz, D.J.Morrissey, B.M.Sherrill, M.Steiner, N.A.Orr, J.A.Winger - Phys.Rev. C49, 46 (1994).
Study of the β-Delayed Neutron Decay of ^{18}N.

1994Sh20 M.H.Shahnas - Phys.Rev. C50, 2346 (1994).
Nolen-Schiffer Anomaly of Mirror Nuclei and Charge Symmetry Breaking in Nuclear Interactions.

1994Wa02 L.S.Warrier, Y.K.Gambhir - Phys.Rev. C49, 871 (1994).
Single Particle Spectrum and Spin-Orbit Splittings in Relativistic Mean Field Theory.

1995Au04 G.Audi, A.H.Wapstra - Nucl.Phys. A595, 409 (1995).
The 1995 Update to the Atomic Mass Evaluation.

1995Be69 J.Bendahan, J.Clayton, K.Frankhauser, T.Gozani, J.Krivicich, R.Loveman, E.Pentaleri, P.Ryge, P.Sawa, J.Stevenson - Nucl.Instrum.Methods Phys.Res. B99, 505 (1995).
Measurements and Analysis of Carbon and Oxygen Neutron Inelastic Cross Sections below 10 MeV.

1995Bu10 G.W.Bund, K.Ueta - Phys.Rev. C51, 2819 (1995).

REFERENCES FOR A=17(CONTINUED)

Simulation of the Exclusion Principle in the Neutron-^{16}O Interaction Through a Repulsive Term and Application to a Three-Body Calculation of the ^{16}O(d,p)^{17}O Reaction.
1995Ch84 Z.Chen - At.Energ.Sci.Tech.(Beijing) 29, 366 (1995).
Reduced R-matrix analysis of ^{17}O system.
1995Fa21 G.Fazio, G.Giardina, O.Yu.Goryunov, A.A.Shvedov, R.Palamara - J.Phys.Soc.Jpn. 64, 1141 (1995).
The (α,^{6}Li) Reaction Mechanism at E(α) = 27.2 MeV.
1995Fo18 H.T.Fortune - Phys.Rev. C52, 2261 (1995).
1d(5/2)−2s(1/2) Splitting in Light Nuclei.
1995Ho13 H.Horiuchi, Y.Kanada-Enyo - Nucl.Phys. A588, 121c (1995).
Light Neutron-Rich Nuclei Studied with Antisymmetrized Molecular Dynamics.
1995Ig07 M.Igashira, Y.Nagai, K.Masuda, T.Ohsaki, H.Kitazawa - Astrophys.J. 441, L89 (1995).
Measurement of the ^{16}O(n,γ)^{17}O Reaction Cross Section at Stellar Energy and the Critical Role of Nonresonant p-Wave Neutron Capture.
1995Kr11 B.Krippa, W.Cassing, U.Mosel - Phys.Lett. 351B, 406 (1995).
Exclusive Meson Production in p-Nucleus Collisions in the 1 GeV Energy Range.
1995Kr12 B.Krippa, W.Cassing, U.Mosel - Nucl.Phys. A592, 539 (1995).
Exclusive Meson Production in Hadron-Nucleus Collisions.
1995Pl02 A.P.Platonov, E.E.Saperstein, S.V.Tolokonnikov, S.A.Fayans - Yad.Fiz. 58, No 4, 612 (1995); Phys.Atomic Nuclei 58, 556 (1995).
Effective Spin-Isospin NN Interaction at High Momentum Transfer and the Elastic Magnetic Scattering of Electrons by Nuclei.
1995ReZZ P.L.Reeder, Y.Kim, W.K.Hensley, H.S.Miley, R.A.Warner, Z.Y.Zhou, D.J.Vieira, J.M.Wouters, H.L.Seifert - Proc.Intern.Conf on Exotic Nuclei and Atomic Masses, Arles, France, June 19-23, 1995, p.587 (1995).
Beta Decay Half-Lives and Delayed Particle Emission from TOFI Measurements.
1995Ro28 C.Rolfs, I.J.R.Baumvol - Z.Phys. A353, 127 (1995).
Characterisation of Ultrathin Dielectric Films with Ion Beams.
1995Se02 R.M.Sellers, D.M.Manley, M.M.Niboh, D.S.Weerasundara, R.A.Lindgren, B.L.Clausen, M.Farkhondeh, B.E.Norum, B.L.Berman - Phys.Rev. C51, 1926 (1995).
Inelastic Electron Scattering from ^{18}O at Backward Angles.
1995Sh10 R.Shyam, W.Cassing, U.Mosel - Nucl.Phys. A586, 557 (1995).
Exclusive Pion Production in Proton-Nucleus Collisions and the Relativistic Two Nucleon Dynamics.
1996Bu20 A.Bulgac, V.R.Shaginyan - Nucl.Phys. A601, 103 (1996).
A Systematic Surface Contribution to the Ground-State Binding Energies.
1996De49 A.S.Demiyanova, A.A.Ogloblin - Bull.Rus.Acad.Sci.Phys. 60, 4 (1996).
Deep Quasielastic Mechanism of Nuclear Reactions.
1996Gi14 G.Giorginis, P.Misaelides, A.Crametz, M.Conti - Nucl.Instrum.Methods Phys.Res. B 113, 396 (1996).
Cross section of the ^{14}N(α,p_0)^{17}O nuclear reaction for analytical applications.
1996Go14 S.A.Goncharov, O.M.Knyazkov, A.A.Kolozhvari - Yad.Fiz. 59, No 4, 666 (1996); Phys.Atomic Nuclei 59, 634 (1996).
Isospin Dependence of Nucleus-Nucleus Interaction from Data on Scattering of Isobaric Nuclei.
1996Gu23 I.S.Gurbanovich, V.G.Neudatchin, E.A.Romanovsky - Yad.Fiz. 59, No 12, 2141 (1996); Phys.Atomic Nuclei 59, 2061 (1996).
Stripping as Multiple Nucleon Exchange: Tensor polarization.
1996Ja12 L.Jarczyk, B.Kamys, M.Kistryn, A.Magiera, Z.Rudy, A.Strzalkowski, R.Barna, V.D'Amico, D.De Pasquale, A.Italiano, M.Licandro - Phys.Rev. C54, 1302 (1996).
Five-Nucleon Simultaneous and Sequential Transfer in the ^{12}C(^{11}B,^{6}Li)^{17}O and ^{12}C(d,^{7}Li)^{7}Be Reactions.
1996Ka52 D.N.Kadrev, A.N.Antonov, M.V.Stoitsov, S.S.Dimitrova - Int.J.Mod.Phys. E5, 717 (1996).
Natural Orbitals and Electron Elastic Magnetic Scattering by Nuclei.
1996Le06 G.Levai, J.Cseh - Phys.Lett. 381B, 1 (1996).
Consistent Semimicroscopic Algebraic Description of Core + α-Particle Systems in the A = 16 to 20 Region.
1996Ma36 V.S.Mathur, A.Acharya - Pramana 46, 67 (1996).
Conservation of Channel Spin in Transfer Reactions.
1996Na27 Y.Nagai, T.Shima, T.S.Suzuki, H.Sato, T.Kikuchi, T.Kii, M.Igashira, T.Ohsaki - Hyperfine Interactions 103, 43 (1996).
Fast Neutron Capture Reactions in Nuclear Astrophysics.
1996Ra02 G.Raimann, A.Ozawa, R.N.Boyd, F.R.Chloupek, M.Fujimaki, K.Kimura, T.Kobayashi, J.J.Kolata, S.Kubono, I.Tanihata, Y.Watanabe, K.Yoshida - Phys.Rev. C53, 453 (1996).
Levels in ^{17}C Above the ^{16}C + Neutron Threshold.
1996Ti02 N.K.Timofeyuk, P.Descouvemont, D.Baye - Nucl.Phys. A600, 1 (1996).
Microscopic Calculation of ^{17}Ne and ^{17}N Properties in a Three-Cluster Generator-Coordinate Method.
1996Ue02 H.Ueno, K.Asahi, H.Izumi, K.Nagata, H.Ogawa, A.Yoshimi, H.Sato, M.Adachi, Y.Hori, K.Mochinaga, H.Okuno, N.Aoi, M.Ishihara, A.Yoshida, G.Liu, T.Kubo, N.Fukunishi, T.Shimoda, H.Miyatake, M.Sasaki, T.Shirakura, N.Takahashi, S.Mitsuoka, W.-D.Schmidt-Ott - Phys.Rev. C53, 2142 (1996).
Magnetic Moments of ^{17}N and ^{17}B.

REFERENCES FOR A=17(CONTINUED)

1996UeZZ H.Ueno, K.Asahi, H.Izumi, K.Nagata, H.Okuno, H.Ogawa, A.Yoshimi, H.Sato, M.Adachi, Y.Hori, K.Mochinaga, N.Aoi, A.Yoshida, G.Liu, T.Kubo, T.Shimoda, H.Miyatake, S.Mitsuoka, M.Sasaki, T.Shirakura, N.Takahashi, M.Ishihara, W.-D.Schmidt-Ott - Osaka Univ.Lab.Nucl.Studies, Ann.Rept., 1995, p.107 (1996).
Magnetic Moments of ^{17}N and ^{17}B.

1996Vi12 I.C.Vickridge, W.J.Trompetter, G.E.Coote - Nucl.Instrum.Methods Phys.Res. B108, 367 (1996).
$^{15}N(d,\alpha_0)^{13}C$ Cross Section and Angular Distribution Measurements for Ion Beam Analysis.

1997Ha37 G.M.Hale - Nucl.Phys. A621, 177c (1997).
Extrapolation of α + Carbon Reaction Cross Sections to AstrophysicalEnergies.

1997Ki22 H.Kitagawa, N.Tajima, H.Sagawa - Z.Phys. A358, 381 (1997).
Reaction Cross Sections and Radii of $A = 17$ and $A = 20$ Isobars.

1997Li10 A.Likar, T.Vidmar - Nucl.Phys. A619, 49 (1997).
Direct Neutron Capture in Light Nuclei.

1997Mi08 D.J.Millener - Phys.Rev. C55, R1633 (1997).
First-Forbidden β Decay of ^{17}N and ^{17}Ne.

1997Mo06 P.Mohr, H.Herndl, H.Oberhummer - Phys.Rev. C55, 1591 (1997).
Spectroscopic Factors for Bound s-Wave States Derived from Neutron Scattering Lengths.

1997Pr05 L.Prochniak, S.Szpikowski, W.Berej - J.Phys.(London) G23, 705 (1997).
Binding Energy of the sd Shell Nuclei in the Supersymmetric Model.

1997Re07 Z.Ren, B.Chen, Z.Ma, G.Xu - Z.Phys. A357, 137 (1997).
Level Inversion of $N = 9$ Isotones in the Relativistic Mean-Field Theory.

1997Si10 A.Ya.Silenko - Yad.Fiz. 60, No 3, 432 (1997); Phys.Atomic Nuclei 60, 361 (1997).
Theoretical Investigation of Electric Quadrupole Moments of Nuclei.

1997Si34 A.Ya.Silenko - Bull.Rus.Acad.Sci.Phys. 61, 1674 (1997).
Current Electric Quadrupole Moments for Some Nuclei.

1998Ao02 S.Aoyama, K.Kato, K.Ikeda - Prog.Theor.Phys.(Kyoto) 99, 623 (1998).
The Mechanism of the Anomalous Energy Shift between s-States in Mirror Nuclei with a Halo Structure.

1998Mu12 A.Mukherjee, U.D.Pramanik, S.Chattopadhyay, M.S.Sarkar, A.Goswami, P.Basu, S.Bhattacharya, M.L.Chatterjee, B.Dasmahapatra - Nucl.Phys. A635, 305 (1998); Erratum Nucl.Phys. A640, 509 (1998).
Fusion Cross Sections for $^{6}Li + ^{12}C$ and $^{6}Li + ^{13}C$ Reactions at Low Energies.

1999An35 C.Angulo, M.Arnould, M.Rayet, P.Descouvemont, D.Baye, C.Leclercq-Willain, A.Coc, S.Barhoumi, P.Aguer, C.Rolfs, R.Kunz, J.W.Hammer, A.Mayer, T.Paradellis, S.Kossionides, C.Chronidou, K.Spyrou, S.Degl'Innocenti, G.Fiorentini, B.Ricci, S.Zavatarelli, C.Providencia, H.Wolters, J.Soares, C.Grama, J.Rahighi, A.Shotter, M.Lamehi-Rachti - Nucl.Phys. A656, 3 (1999).
A Compilation of Charged-Particle Induced Thermonuclear Reaction Rates.

1999Ga57 Y.K.Gambhir, C.S.Warke - Pramana 53, 279 (1999).
Nuclear Magnetic Moment: Relativistic mean field description.

1999Ki28 H.Kitagawa - Prog.Theor.Phys.(Kyoto) 102, 1015 (1999).
Shell Model Study of the Quadrupole Moments in Light Mirror Nuclei.

1999Le04 R.Lewis, A.C.Hayes - Phys.Rev. C59, 1211 (1999).
Deuteron Stripping as a Probe of the Proton Halo in ^{17}F.

1999Ti04 N.K.Timofeyuk, R.C.Johnson - Phys.Rev. C59, 1545 (1999).
Deuteron Stripping and Pick-Up on Halo Nuclei.

1999Ts06 K.Tsushima, K.Saito, A.W.Thomas - Phys.Lett. 465B, 36 (1999).
Charge Symmetry Breaking in Mirror Nuclei from Quarks.

1999Xu07 H.Xu, Z.Zhou, C.Zhang, G.Zhao, L.Shi - Nucl.Instrum.Methods Phys.Res. B 149, 390 (1999).
Excitation function and angular distribution for the $^{14}N(\alpha,p)^{17}O$ reaction.

2000Bh07 R.Bhattacharya - Pramana 54, 247 (2000).
Skyrme-Hartree-Fock Approach to the Change of Level Occupancy of Low Mass Halo Nuclei.

2000Bu33 A.Buta, T.Martin, C.Timis, N.Achouri, J.C.Angelique, C.Borcea, I.Cruceru, A.Genoux-Lubain, S.Grevy, M.Lewitowicz, E.Lienard, F.M.Marques, F.Negoita, F.de Oliveira, N.A.Orr, J.Peter, M.Sandu - Nucl.Instrum.Methods Phys.Res. A455, 412 (2000).
TONNERRE: An array for delayed-neutron decay spectroscopy.

2000El08 Z.Elekes, A.Z.Kiss, I.Biron, T.Calligaro, J.Salomon - Nucl.Instrum.Methods Phys.Res. B168, 305 (2000).
Thick Target γ-Ray Yields for Light Elements Measured in the Deuteron Energy Interval of 0.7-3.4 MeV.

2000Fa12 D.Q.Fang, W.Q.Shen, J.Feng, X.Z.Cai, J.S.Wang, Q.M.Su, H.Y.Zhang, P.Y.Hu, Y.G.Ma, Y.T.Zhu, S.L.Li, H.Y.Wu, Q.B.Gou, G.M.Jin, W.L.Zhan, Z.Y.Guo, G.Q.Xiao - Phys.Rev. C61, 064311 (2000).
Measurements of Total Reaction Cross Sections for Some Light Nuclei at Intermediate Energies.

2000Ik01 N.Ikeda, F.Nakamura, K.Mizuuchi, T.Sugimitsu, S.Teruyama, T.Okamoto, H.Fujita, S.Morinobu - Eur.Phys.J. A 7, 491 (2000).
Tensor Polarization of $^{12}C[2^+_1]$ in the $^{16}O(^{13}C,^{12}C)^{17}O$ Reaction at 50 MeV.

2000OhZY T.Ohsaki, Y.Nagai, M.Igashira, T.Shima, H.Kitazawa, K.Takaoka, M.Kinoshita, Y.Nobuhara, A.Tomyo, H.Makii, K.Mishima - Proc.10th Intern.Symposium on Capture Gamma-Ray Spectroscopy and Related Topics, Santa Fe, New Mexico, 30 August-3 September 1999, S.Wender, Ed., p.458 (2000); AIP Conf.Proc. 529 (2000).

REFERENCES FOR A=17(CONTINUED)

keV-Neutron Capture Cross Sections of Light Nuclei and Nucleosynthesis.

2000SaZK R.O.Sayer, L.C.Leal, N.M.Larson, R.R.Spencer, R.Q.Wright - ORNL/TM-2000/212 (2000).
R-Matrix Evaluation of ^{16}0 Neutron Cross Sections up to 6.3 MeV.

2000Se23 N.Severijns, J.Deutsch, D.Beck, M.Beck, B.Delaure, T.Phalet, R.Prieels, P.Schuurmans, B.Vereecke, S.Versyck - Hyperfine Interactions 129, 223 (2000).
Fundamental weak interaction studies using polarised nuclei and ion traps.

2000Sp07 J.-M.Sparenberg, D.Baye, B.Imanishi - Phys.Rev. C61, 054610 (2000).
Coupled-Reaction-Channel Calculations of the ^{16}O + ^{17}O and ^{16}O + ^{17}F Charge-Symmetric Systems.

2001Ag09 B.K.Agrawal, T.Sil, S.K.Samaddar, J.N.De, S.Shlomo - Phys.Rev. C64, 024305 (2001).
Coulomb Energy Differences in Mirror Nuclei Revisited.

2001Au01 N.Auerbach, N.Vinh Mau - Phys.Rev. C63, 017301 (2001).
About Coulomb Energy Shifts in Halo Nuclei.

2001Du11 M.Dufour, P.Descouvemont - Nucl.Phys. A688, 154c (2001).
The $^{15}O(\alpha,\gamma)^{19}Ne$ and $^{13}C(\alpha,n)^{16}O$ Reactions in a Multicluster Model.

2001Du12 M.Dufour, P.Descouvemont - Nucl.Phys. A694, 221 (2001).
Microscopic Analysis of the $^{13}C(\alpha,n)^{16}O$ and $^{16}O(n,\gamma)^{17}O$Reactions.

2001Gr06 S.Grevy, N.L.Achouri, J.C.Angelique, C.Borcea, A.Buta, F.De Oliveira,M.Lewitowicz, E.Lienard, T.Martin, F.Negoita, N.A.Orr, J.Peter, S.Pietri, C.Timis - Phys.Rev. C63, 037302 (2001).
Observation of a New Transition in the β-Delayed Neutron Decay of ^{16}C.

2001He22 M.Heil, A.Couture, J.Daly, R.Detwiler, J.Gorres, G.Hale, F.Kappeler, R.Reifarth, U.Giesen, E.Stech, P.Tischhauser, C.Ugalde, M.Wiescher - Nucl.Phys. A688, 499c (2001).
A Measurement of the $^{13}C(\alpha,\alpha)$ Differential Cross Section and ItsApplication to the $^{13}C(\alpha,n)$ Reaction.

2001Ka06 S.P.Kamerdzhiev, R.J.Liotta, V.I.Tselyaev - Phys.Rev. C63, 034304 (2001).
Random Phase Approximation for Odd Nuclei and Its Application to the Description of the Electric Dipole Modes in ^{17}O.

2001Le23 A.Leistenschneider, T.Aumann, K.Boretzky, D.Cortina, J.Cub, U.D.Pramanik, W.Dostal, Th.W.Elze, H.Emling, H.Geissel, A.Grunschloss, M.Hellstrom, R.Holzmann, S.Ilievski, N.Iwasa, M.Kaspar, A.Kleinbohl, J.V.Kratz, R.Kulessa, Y.Leifels, E.Lubkiewicz, G.Munzenberg, P.Reiter, M.Rejmund, C.Scheidenberger, C.Schlegel, H.Simon, J.Stroth, K.Summerer, E.Wajda, W.Walus, S.Wan - Phys.Rev.Lett. 86, 5442 (2001).
Photoneutron Cross Sections for Unstable Neutron-Rich Oxygen Isotopes.

2001Oz03 A.Ozawa, O.Bochkarev, L.Chulkov, D.Cortina, H.Geissel, M.Hellstrom, M.Ivanov, R.Janik, K.Kimura, T.Kobayashi, A.A.Korsheninnikov, G.Munzenberg, F.Nickel, Y.Ogawa, A.A.Ogloblin, M.Pfutzner, V.Pribora, H.Simon, B.Sitar, P.Strmen, K.Summerer, T.Suzuki, I.Tanihata, M.Winkler, K.Yoshida - Nucl.Phys. A691, 599 (2001).
Measurements of Interaction Cross Sections for Light Neutron-Rich Nuclei at Relativistic Energies and Determination of Effective Matter Radii.

2001Oz04 A.Ozawa, T.Suzuki, I.Tanihata - Nucl.Phys. A693, 32 (2001).
Nuclear Size and Related Topics.

2001Sa52 H.Sagawa, T.Suzuki - Acta Phys.Hung.N.S. 13, 3 (2001).
Pigmy and Giant Dipole States in Stable and Unstable Oxygen Isotopes.

2001Sh17 V.R.Shaginyan - Yad.Fiz. 64, No 3, 525 (2001); Phys.Atomic Nuclei 64, 471 (2001).
Coulomb Energy of Nuclei.

2001Sh27 H.Sharda, R.K.Bansal, A.Kumar - Eur.Phys.J. A 10, 295 (2001).
Application of Dipole Sum Rules to Transfer Reaction Strengths.

2002Ku35 N.Kubota, A.Taniike, Y.Furuyama, A.Kitamura - Nucl.Instrum.Methods Phys.Res. B195, 358 (2002).
Simultaneous measurement of deuterium distribution and impurities by emission angle analysis of deuteron induced reaction products.

2002Mi17 N.Michel, J.Okolowicz, F.Nowacki, M.Ploszajczak - Nucl.Phys. A703, 202 (2002).
First-Forbidden Mirror β-Decays in A = 17 Mass Region.

2002NeZY R.O.Nelson, A.Michaudon, M.B.Chadwick, P.G.Young - Proc.Intern.Conf.Nuclear Data for Science and Technology (ND2001), Tsukuba, Japan, 7-12 October, 2001, K.Shibata, Ed., Atomic Energy Society of Japan, Vol.1, p.401 (2002).
High-Resolution Neutron-Induced γ-Ray Production Cross Sections for Oxygen and Beryllium for Neutron Energies from 4 to 200 MeV.

2002Pr10 U.D.Pramanik, T.Aumann, A.Leistenschneider, K.Boretzky, D.Cortina, Th.W.Elze, H.Emling, H.Geissel, A.Grunschloss, M.Hellstrom, R.Holzmann, S.Ilievski, N.Iwasa, J.V.Kratz, R.Kulessa, Y.Leifels, E.Lubkiewicz, G.Munzenberg, P.Reiter, M.Rejmund, C.Scheidenberger, Ch.Schlegel, H.Simon, J.Stroth, K.Summerer, E.Wajda, W.Walus - Nucl.Phys. A701, 199c (2002).
Measurement of the Dipole Response of Neutron-Rich Nuclei in the A ∼20 Region.

2002Re13 R.C.Reedy, S.C.Frankle - At.Data Nucl.Data Tables 80, 1 (2002).
Prompt Gamma Rays from Radiative Capture of Thermal Neutrons by Elements from Hydrogen Through Zinc.

2002Zh28 S.-H.Zhou, J.Zhou - Chin.Phys.Lett. 19, 1065 (2002).
Halo Structure of Isobaric Analogue States in A = 21 and 17 Mirror Nuclei.

2003Au03 G.Audi, A.H.Wapstra, C.Thibault - Nucl.Phys. A729, 337 (2003).
The AME2003 atomic mass Evaluation (II). Tables, graphs, and references.

2003Ji11 W.Jiang, V.Shutthanandan, S.Thevuthasan, D.E.Mccready, W.J.Weber - Nucl.Instrum.Methods Phys.Res. B 207, 453 (2003).

REFERENCES FOR A=17(CONTINUED)

Oxygen analysis using energetic ion beams.
2003Ka51 S.Kato, K.Abe, S.Kubono, T.Teranishi, M.Kurokawa, X.Liu, P.Strasser, N.Imai, K.Kumagai, C.S.Lee, Y.K.Kwon, C.Lee, J.H.Ha, Y.K.Kim, M.H.Tanaka, Y.Fuchi - Nucl.Phys. A718, 189c (2003).
Determination of the sub-threshold contribution in the $^{13}C(\alpha,n)^{16}O$ reaction for the neutrons of s-process.
2003Ke10 N.Keeley, K.W.Kemper, D.T.Khoa - Nucl.Phys. A726, 159 (2003).
DWBA analysis of the $^{13}C(^{6}Li,d)^{17}O$ reaction at 10 MeV/nucleon and its astrophysical implications.
2003Ku03 S.Kubono, K.Abe, S.Kato, T.Teranishi, M.Kurokawa, X.Liu, N.Imai, K.Kumagai, P.Strasser, M.H.Tanaka, Y.Fuchi, C.S.Lee, Y.K.Kwon, L.Lee, J.H.Ha, Y.K.Kim - Phys.Rev.Lett. 90, 062501 (2003).
Determination of the Subthreshold State Contribution in $^{13}C(\alpha,n)^{16}O$, the Main Neutron-Source Reaction for the s Process.
2003Ku36 S.Kubono, T.Teranishi, S.Kato - Nucl.Phys. A722, 17c (2003).
Low-energy nuclear reaction studies with RI beams in nuclear astrophysics.
2003Ma70 H.Masui, T.Myo, K.Kato, K.Ikeda - Nucl.Phys. A722, 469c (2003).
Coupled-channel study for O-isotopes with the core plus valence neutrons model.
2003Mb05 H.Masui, T.Myo, K.Kato, K.Ikeda - Mod.Phys.Lett. A 18, 186 (2003).
Coupled-channel study for O-isotopes with the core plus valence neutrons model.
2003Mi01 H.Miyatake, H.Ueno, Y.Yamamoto, N.Aoi, K.Asahi, E.Ideguchi, M.Ishihara, H.Izumi, T.Kishida, T.Kishida, T.Kubo, S.Mitsuoka, Y.Mizoi, M.Notani, H.Ogawa, A.Ozawa, M.Sasaki, T.Shimoda, T.Shirakura, N.Takahashi, S.Tanimoto, K.Yoneda - Phys.Rev. C 67, 014306 (2003).
Spin-parity assignments in $^{15}C^{*}$ by a new method: β-delayed spectroscopy for a spin-polarized nucleus.
2003Ra04 R.A.Radhi, A.Bouchebak - Nucl.Phys. A716, 87 (2003).
Microscopic calculations of C2 and C4 form factors in sd-shell nuclei.
2003Ra09 R.A.Radhi - Eur.Phys.J. A 16, 387 (2003).
Single-particle quadrupole electromagnetic transitions in p-shell andsd-shell nuclei.
2003Ra30 R.A.Radhi, N.T.Khalaf, A.A.Najim - Nucl.Phys. A724, 333 (2003).
Elastic magnetic electron scattering from ^{17}O, ^{25}Mg, and ^{27}Al.
2003Sm02 N.A.Smirnova, C.Volpe - Nucl.Phys. A714, 441 (2003).
On the asymmetry of Gamow-Teller β-decay rates in mirror nuclei in relation with second-class currents.
2003Ti13 N.K.Timofeyuk, R.C.Johnson, A.M.Mukhamedzhanov - Phys.Rev.Lett. 91, 232501 (2003).
Relation between Proton and Neutron Asymptotic Normalization Coefficients for Light Mirror Nuclei and its Relevance to Nuclear Astrophysics.
2003Zh29 H.-Y.Zhang, W.-Q.Shen, Z.-Z.Ren, Yu.-G.Ma, J.-G.Chen, X.-Z.Cai, Z.-H.Lu, C.Zhong, W.Guo, Y.-B.Wei, X.-F.Zhou, G.-L.Ma, K.Wang - Chin.Phys.Lett. 20, 1462 (2003).
Structures of ^{17}F and ^{17}O, ^{17}Ne and ^{17}N in the Ground State and the First Excited State.
2004As11 M.Assuncao, R.Lichtenthaler, V.Guimaraes, A.Lepine-Szily, G.F.Lima, A.M.Moro - Phys.Rev. C 70, 054601 (2004).
Higher order effects in the $^{16}O(d,p)^{17}O$ and $^{16}O(d,n)^{17}F$ transfer reactions.
2004El05 M.A.Elkin, B.S.Ishkhanov, I.M.Kapitonov, E.I.Lileeva, E.V.Shirokov - Yad.Fiz. 67, 675 (2004); Phys.Atomic Nuclei 67, 653 (2004).
Isotopic Effect in the Width of a Giant Dipole Resonance in Light Nuclei.
2004Fu04 S.Fujii, R.Okamoto, K.Suzuki - Phys.Rev. C 69, 034328 (2004).
Charge-dependent calculations of single-particle energies in nuclei around ^{16}O with modern nucleon-nucleon interactions.
2004Gu23 A.F.Gurbich, S.L.Molodtsov - Nucl.Instrum.Methods Phys.Res. B 226, 637 (2004).
Application of IBA-techniques to silicon profiling in protective oxide films on a steel surface.
2004Is09 B.S.Ishkhanov, V.N.Orlin - Yad.Fiz. 67, 944 (2004); Phys.Atomic Nuclei 67, 920 (2004).
Semimicroscopic Description of the Gross Structure of Giant Dipole Resonances in Carbon, Nitrogen, and Oxygen Isotopes.
2004Mc02 P.McEwan, M.Freer - J.Phys.(London) G30, 447 (2004).
Characterization of molecular structures in the deformed harmonic oscillator.
2004Pa08 R.Palit, P.Adrich, T.Aumann, K.Boretzky, D.Cortina, U.Datta Pramanik,Th.W.Elze, H.Emling, M.Fallot, H.Geissel, M.Hellstrom, K.L.Jones, L.H.Khiem, J.V.Kratz, R.Kulessa, Y.Leifels, A.Leistenschneider, G.Munzenberg, C.Nociforo, P.Reiter, H.Simon, K.Summerer, W.Walus - Nucl.Phys. A731, 235 (2004).
Dipole excitations of neutron-proton asymmetric nuclei.
2004ScZX W.Schwerdtfeger, C.Alvarez, A.Bergmaier, G.Dollinger, T.Faestermann, R.Gernhauser, D.Habs, T.Kroll, R.Krucken, H.J.Maier, T.Morgan, P.G.Thirolf, H.H.Wolter, W.von Oertzen - Maier-Leibnitz-Laboratorium 2003 Ann.Rept., p.4 (2004).
Test of Two-Neutron Transfer Reactions with ^{10}Be Targets at the Q3D.
2005Ad03 A.Adahchour, P.Descouvemont - Eur.Phys.J. A 23, 435 (2005).
A test of the zero-range DWBA method at astrophysical energies.
2005An15 A.Antusek, K.Jackowski, M.Jaszunski, W.Makulski, M.Wilczek - Chem.Phys.Lett. 411, 111 (2005).
Nuclear magnetic dipole moments from NMR spectra.
2005Ba78 R.Babut, O.Bouland, E.Fort - Nucl.Sci.Eng. 151, 135 (2005).
Reich-Moore Parameterization of (α,n) Reactions on Light Nuclei: Impact on a Neutron Source Calculation in an Oxide Fuel.
2005De54 G.Della Mea, A.Patelli, S.Restello, V.Rigato, A.Vomiero - Nucl.Instrum.Methods Phys.Res. B240, 803 (2005).
$^{14}N(\alpha,p)^{17}O$ nuclear reaction cross-section at 4.9-6.1 MeV.

REFERENCES FOR A=17(CONTINUED)

2005Du20 M.Dufour, P.Descouvemont - Phys.Rev. C 72, 015801 (2005).
Multichannel study of the $^{13}C(\alpha,n)^{16}O$ and $^{16}O(n,\gamma)^{17}O$ reactions.

2005Ha69 S.Harissopulos, H.W.Becker, J.W.Hammer, A.Lagoyannis, C.Rolfs, F.Strieder - Phys.Rev. C 72, 062801 (2005).
Cross section of the $^{13}C(\alpha,n)^{16}O$ reaction: A background for the measurement of geo-neutrinos.

2005Li60 Z.H.Li, Y.L.Ye, H.Hua, D.X.Jiang, Y.M.Zhang, F.R.Xu, Q.Y.Hu, G.L.Zhang, Z.Q.Chen, T.Zheng, C.E.Wu, J.L.Lou, X.Q.Li, D.Y.Pang, S.Wang, C.Li, H.S.Xu, Z.Y.Sun, L.M.Duan, Z.G.Hu, R.J.Hu, H.G.Xu, R.S.Mao, Y.Wang, X.H.Yuan, H.Gao, L.J.Wu, H.R.Qi, T.H.Huang, F.Fu, F.Jia, Q.Gao, X.L.Ding, J.L.Han, X.Y.Zhang - Phys.Rev. C 72, 064327 (2005).
β-decay of the neutron-rich nucleus ^{18}N.

2005Ni24 G.K.Nie - Bull.Rus.Acad.Sci.Phys. 69, 100 (2005).
DWBA model parameters and spectroscopic information on nuclei from analysis of one-nucleon transfer reactions.

2005Pi19 M.Pignatari, R.Gallino, F.Kappeler, M.Wiescher - Nucl.Phys. A758, 541c (2005).
Effects of uncertainties of the $^{22}Ne(\alpha,n)^{25}Mg$ and $^{13}C(\alpha,n)^{16}O$ reaction rates in the s-process yields.

2005St25 S.Starrfield, W.R.Hix, F.X.Timmes, E.M.Sion, W.M.Sparks, S.J.Dwyer - Nucl.Phys. A758, 455c (2005).
Studies of Accretion onto Hot, Massive White Dwarfs: The Growth to the Chandrasekhar Limit?.

2005Ti07 N.K.Timofeyuk, P.Descouvemont - Phys.Rev. C 71, 064305 (2005).
Asymptotic normalization coefficients for mirror virtual nucleon decays in a microscopic cluster model.

2005Ts03 M.B.Tsang, J.Lee, W.G.Lynch - Phys.Rev.Lett. 95, 222501 (2005).
Survey of Ground State Neutron Spectroscopic Factors from Li to Cr Isotopes.

2005Ty02 S.Typel, G.Baur - Nucl.Phys. A759, 247 (2005).
Electromagnetic strength of neutron and proton single-particle halo nuclei.

2005Vo01 A.Volya, V.Zelevinsky - Phys.Rev.Lett. 94, 052501 (2005).
Discrete and Continuum Spectra in the Unified Shell Model Approach.

2005Wl02 M.Wloch, J.R.Gour, P.Piecuch, D.J.Dean, M.Hjorth-Jensen, T.Papenbrock - J.Phys.(London) G31, S1291 (2005).
Coupled-cluster calculations for ground and excited states of closed-and open-shell nuclei using methods of quantum chemistry.

2006Go22 J.R.Gour, P.Piecuch, M.Hjorth-Jensen, M.Wloch, D.J.Dean - Phys.Rev. C 74, 024310 (2006).
Coupled-cluster calculations for valence systems around ^{16}O.

2006Id01 R.Id Betan, N.Sandulescu, T.Vertse - Nucl.Phys. A771, 93 (2006).
Quasiparticle resonances in the BCS approach.

2006Jo11 E.D.Johnson, G.V.Rogachev, A.M.Mukhamedzhanov, L.T.Baby, S.Brown, W.T.Cluff, A.M.Crisp, E.Diffenderfer, V.Z.Goldberg, B.W.Green, T.Hinners, C.R.Hoffman, K.W.Kemper, O.Momotyuk, P.Peplowski, A.Pipidis, R.Reynolds, B.T.Roeder - Phys.Rev.Lett. 97, 192701 (2006).
Astrophysical Reaction Rate for the Neutron-Generator Reaction $^{13}C(\alpha, n)^{16}O$ in Asymptotic Giant Branch Stars.

2006Ma17 H.Masui, K.Kato, K.Ikeda - Phys.Rev. C 73, 034318 (2006).
Study of oxygen isotopes and N=8 isotones with an extended cluster-orbital shell model.

2006Me26 P.Mermod, J.Blomgren, C.Johansson, A.Ohrn, M.Osterlund, S.Pomp, B.Bergenwall, J.Klug, L.Nilsson, N.Olsson, U.Tippawan, P.Nadel-Turonski, O.Jonsson, A.Prokofiev, P.-U.Renberg, Y.Maeda, H.Sakai, A.Tamii, K.Amos, R.Crespo, A.Moro - Phys.Rev. C 74, 054002 (2006).
95 MeV neutron scattering on hydrogen, deuterium, carbon, and oxygen.

2006Sz07 G.A.Sziki, A.Simon, Z.Szikszai, Zs.Kertesz, E.Dobos - Nucl.Instrum.Methods Phys.Res. B251, 343 (2006).
Gamma ray production cross-sections of deuteron induced nuclear reactions for light element analysis.

2006Vo14 A.Volya, V.Zelevinsky - Phys.Rev.C 74, 064314 (2006).
Continuum shell model.

2006We05 P.Wei, S.C.Gujrathi, M.Guihard, F.Schiettekatte - Nucl.Instrum.Methods Phys.Res. B249, 85 (2006).
Cross-section for $^{14}N(\alpha,p_0)^{17}O$ reaction in the energy range3.2-4.0 MeV.

2006Ya12 J.M.Yao, H.Chen, J.Meng - Phys.Rev. C 74, 024307 (2006).
Time-odd triaxial relativistic mean field approach for nuclear magnetic moments.

2007AsZY M.Assuncao, R.Lichtenthaler, V.Guimaraes, A.Lepine-Szily, A.M.Moro - Proc.Int.Symp.on Nuclear Astrophysics, Nuclei in the Cosmos IX, Geneva, Switzerland, Proceedings of Science, Italy, 071 (2007).
Analysis of the $^{16}O(d,p)^{17}O$ and $^{16}O(d,n)^{17}F$ transfer reactions to determine astrophysical direct capture cross sections.

2007AsZZ M.Assuncao, R.Lichtenthaler, V.Guimaraes, A.Lepine-Szily, A.M.Moro - Proc.VI Latin American Symp,on Nuclear Physics and Applications, Iguazu, Argentina, 3-7 Oct. 2005, O.Civitarese, C.Dorso, G.Garcia Bermudez, A.J.Kreiner, A.J.Pacheco, N.N.Scoccola, Eds. p.158 (2007); AIP Conf.Proc. 884 (2007).
Astrophysical S-factors for the p+^{16}O and n + ^{16}O captures fromthe analysis of $^{16}O(d,n)^{17}F$ and $^{16}O(d,p)^{17}O$ transfer reactions.

2007Be09 H.Behzadi, M.D.Esrafili, N.L.Hadipour - Chem.Phys. 333, 97 (2007).
A theoretical study of ^{17}O, ^{14}N and ^{2}H nuclear quadrupole coupling tensors in the real crystalline structure of acetaminophen.

2007Be54 C.A.Bertulani, G.Cardella, M.De Napoli, G.Raciti, E.Rapisarda - Phys.Lett. B 650, 233 (2007).
Coulomb excitation of unstable nuclei at intermediate energies.

2007Bu01 L.Buchmann, J.D′Auria, M.Dombsky, U.Giesen, K.P.Jackson, P.McNeely, J.Powell, A.Volya - Phys.Rev. C 75, 012804 (2007).

REFERENCES FOR A=17(CONTINUED)

β-delayed α emission of ^{18}N: Broad $J^\pi = 1^-$ states in the $^{14}C + \alpha$ system.

2007Ch73 H.Chen, H.Mei, J.Meng, J.M.Yao - Phys.Rev. C 76, 044325 (2007).
Binding energy differences of mirror nuclei in a time-odd triaxial relativistic mean field approach.

2007Do20 T.Dong, Z.Ren, Y.Guo - Phys.Rev. C 76, 054602 (2007).
Elastic magnetic form factors of exotic nuclei.

2007Gu03 Y.-Q.Guo, Z.-Z.Ren - Chin.Phys.Lett. 24, 652 (2007).
Structures of Light Neutron-Rich Nuclei with Orbit-Orbit Coupling.

2007Gu18 B.Guo, Z-H.Li, W.-P.Liu, X.-X.Bai - Chin.Phys.Lett. 24, 2544 (2007).
Test of Determination of (p,γ) Astrophysical S-Factors Using the Asymptotic Normalization Coefficients from Neutron Transfer Reactions.

2007Lo05 J.L.Lou, Z.H.Li, Y.L.Ye, H.Hua, D.X.Jiang, L.H.Lv, Z.Kong, Y.M.Zhang,F.R.Xu, T.Zheng, X.Q.Li, Y.C.Ge, C.Wu, G.L.Zhang, Z.Q.Chen, C.Li, D.Y.Pang, H.S.Xu, Z.Y.Sun, L.M.Duan, Z.G.Hu, R.J.Hu, H.G.Xu, R.S.Mao, Y.Wang, X.H.Yuan, H.Gao, L.J.Wu, H.R.Qi, T.H.Huang, F.Fu, F.Jia, Q.Gao, X.L.Ding, J.L.Han, X.Y.Zhang - Phys.Rev. C 75, 057302 (2007).
Observation of a new transition in the beta-delayed neutron decay of ^{18}N.

2007Mu10 A.M.Mukhamedzhanov, L.D.Blokhintsev, S.Brown, V.Burjan, S.Cherubini, V.Z.Goldberg, M.Gulino, B.F.Irgaziev, E.Johnson, K.Kemper, V.Kroha, M.La Cognata, L.Lamia, A.Momotyuk, R.G.Pizzone, B.Roeder, G.Rogachev, S.Romano, C.Spitaleri, R.E.Tribble, A.Tumino - Nucl.Phys. A787, 321c (2007).
Indirect Techniques in Nuclear Astrophysics. Asymptotic NormalizationCoefficient and Trojan Horse.

2007Pa10 D.Y.Pang, F.M.Nunes, A.M.Mukhamedzhanov - Phys.Rev. C 75, 024601 (2007).
Are spectroscopic factors from transfer reactions consistent with asymptotic normalization coefficients?.

2007PeZZ M.G.Pellegriti, F.Hammache, P.Roussel, L.Audouin, D.Beaumel, S.Fortier, L.Gaudefroy, J.Kiener, A.Lefebvre-Schuhl, M.Stanoiu, V.Tatischeff, M.Vilmay - Proc.Int.Symp.on Nuclear Astrophysics, Nuclei in the Cosmos IX, Geneva, Switzerland, Proceedings of Science, Italy, 161 (2007).
New study of the astrophysical reaction $^{13}C(\alpha,n)^{16}O$ via the $^{13}C(^7Li,t)^{17}O$ transfer reaction.

2007Zh03 D.Zhou, Y.Zheng, D.Yuan, X.Zhang, Y.Zuo, T.Minamisono, M.Matsuta, M.Fukuda, M.Mihara, C.Zhang, Z.Wang, E.Du, H.Luo, G.Xu, S.Zhu - J.Phys.(London) G34, 523 (2007).
Quadrupole moment and a proton halo structure in ^{17}F ($I^\pi = 5/2^+$).

2008Ch05 S.Chiba, H.Koura, T.Hayakawa, T.Maruyama, T.Kawano, T.Kajino - Phys.Rev. C 77, 015809 (2008).
Direct and semi-direct capture in low-energy (n,γ) reactions of neutron-rich tin isotopes and its implications for r-process nucleosynthesis.

2008Cr03 A.M.Crisp, B.T.Roeder, O.A.Momotyuk, N.Keeley, K.W.Kemper, F.Marechal, K.Rusek, W.Weintraub, M.Wiedeking - Phys.Rev. C 77, 044315 (2008).
Survey of ^{17}O excited states selectively populated by five-particle transfer reactions.

2008FiZZ R.B.Firestone, M.Krticka, D.P.McNabb, B.Sleaford, U.Agvaanluvsan, T.Belgya, Zs.Revay - Proc.2007 International Workshop on Compound-Nuclear Reactions and Related Topics, Yosemite Nat.Park, Ca., 22-26 OCT. 2007, J.Escher, F.S.Dietrich, T.Kawano, I.J.Thompson, Eds. p.26 (2008); AIP CONF.PROC. 1005 (2008).
New Methods for the Determination of Total Radiative Thermal Neutron Capture Cross Sections.

2008GiZY G.Giorginis, V.Khryachkov, V.Corcalciuc, M.Kievets - Proc.Intern.Conf.Nuclear Data for Science and Technology, Nice, France, April 22-27, 2007, O.Bersillon, F.Gunsing, E.Bauge, R.Jacqmin, and S.Leray, Eds., p.525 (2008); EDP Sciences, 2008.
The cross section of the $^{16}O(n,\alpha)^{13}C$ reaction in the MeV energy range.

2008He11 M.Heil, R.Detwiler, R.E.Azuma, A.Couture, J.Daly, J.Goerres, F.Kappeler, R.Reifarth, P.Tischhauser, C.Ugalde, M.Wiescher - Phys.Rev. C 78, 025803 (2008).
The $^{13}C(\alpha,n)$ reaction and its role as a neutron source for the s process.

2008KaZX M.Katsuma - Proc.Frontiers in Nuclear Structure, and Reactions (FINUSTAR 2), Crete, Greece, 10-14 Sept. 2007, P.Demetriou, R.Julin, S.V.Harissopulos, Eds. p.365 (2008); AIP Conf.Proc 1012 (2008).
Systematic analysis of astrophysical S-factors and thermonuclear reaction rates.

2008Li53 Y.-J.Liang, Z.-H.Liu, H.-Y.Zhou - Int.J.Mod.Phys. E17, 1729 (2008).
Investigations on the nuclear halo structures.

2008Lu01 M.Lugaro, M.van Raai - J.Phys.(London) G35, 014007 (2008).
New discoveries and challenges for the s process in AGB stars.

2008MeZW P.Mermod, J.Blomgren, C.Johansson, A.Ohrn, M.Osterlund, S.Pomp, B.Bergenwall, J.Klug, L.Nilsson, N.Olsson, U.Tippawan, P.Nadel-Turonski, O.Jonsson, A.Prokofiev, P.-U.Renberg, Y.Maeda, H.Sakai, A.Tamii, K.Amos, R.Crespo - Proc.Intern.Conf.Nuclear Data for Science and Technology, Nice, France, April 22-27, 2007, O.Bersillon, F.Gunsing, E.Bauge, R.Jacqmin, and S.Leray, Eds., p.1039 (2008); EDP Sciences, 2008.
95 MeV neutron scattering on hydrogen, deuterium, carbon and oxygen.

2008Oh05 T.Ohsaki, M.Igashira, Y.Nagai, M.Segawa, K.Muto - Phys.Rev. C 77, 051303 (2008).
Role of multiparticle-multihole states of $^{18,19}O$ in $^{18}O(n,\gamma)^{19}O$ reactions at keV energy.

2008Pe09 M.G.Pellegriti, F.Hammache, P.Roussel, L.Audouin, D.Beaumel, P.Descouvemont, S.Fortier, L.Gaudefroy, J.Kiener, A.Lefebvre-Schuhl, M.Stanoiu, V.Tatischeff, M.Vilmay - Phys.Rev. C 77, 042801 (2008).
Indirect study of the $^{13}C(\alpha,n)^{16}O$ reaction via the $^{13}C(^7Li,t)^{17}O$ transfer reaction.

2008Py02 P.Pyykko - Molecular Physics 106, 1965 (2008).
Year-2008 nuclear quadrupole moments.

REFERENCES FOR A=17(CONTINUED)

2008ReZZ P.L.Reeder - Priv.Com. (2008).

2008RiZX D.Ridikas, A.Barzakh, V.Blideanu, J.-C.David, D.Dore, D.Fedorov, X.Ledoux, F.Moroz, V.Panteleev, R.Plukiene, A.Plukis, A.Prevost, O.Shcherbakov, A.Vorobyev - Proc.Intern.Conf.Nuclear Data for Science and Technology, Nice, France, April 22-27, 2007, O.Bersillon, F.Gunsing, E.Bauge, R.Jacqmin, and S.Leray, Eds., p.1073 (2008); EDP Sciences, 2008.
Measurements of delayed neutrons yields and time spectra from 1 GeV protons interacting with thick ^{nat}Pb, ^{209}Bi and ^{nat}Fe targets.

2008Se10 N.Severijns, M.Tandecki, T.Phalet, I.S.Towner - Phys.Rev. C 78, 055501 (2008).
Ft values of the $T = 1/2$ mirror β transitions.

2008St11 E.Strandberg, M.Beard, M.Couder, A.Couture, S.Falahat, J.Gorres, P.J.LeBlanc, H.Y.Lee, S.O'Brien, A.Palumbo, E.Stech, W.P.Tan, C.Ugalde, M.Wiescher, H.Costantini, K.Scheller, M.Pignatari, R.Azuma, L.Buchmann - Phys.Rev. C 77, 055801 (2008).
$^{24}Mg(\alpha,\gamma)^{28}Si$ resonance parameters at low alpha-particle energies.

2008Su21 X.Sun, W.Qu, J.Duan, J.Zhang - Phys.Rev. C 78, 054610 (2008); Publishers Note Phys.Rev. C 80, 029901(2009).
New calculation method of neutron kerma coefficients for carbon and oxygen below 30 MeV.

2008Ta15 H.Tan, S.Mitra, L.Wielopolski, A.Fallu-Labruyere, W.Hennig, Y.X.Chu, W.K.Warburton - J.Radioanal.Nucl.Chem. 276, 639 (2008).
A multiple time-gated system for pulsed digital gamma-ray spectroscopy.

2008Te09 G.Terwagne, G.Genard, M.Yedji, G.G.Ross - J.Appl.Phys. 104, 084909 (2008).
Cross-section measurements of the $^{14}N(\alpha,p)^{17}O$ and $^{14}N(\alpha,\alpha)^{14}N$ reactions between 3.5 and 6 MeV.

2008ToZV M.Tomaselli, T.Kuhl, D.Ursescu, S.Fritzsche - Proc.of the 9th Internat. Spring Seminar on Nuclear Physics: Changing-Facets of Nuclear Structure, Vico Equense, Italy, May 20-24 2007, A.Covello, Ed., World Scientific, Singapore, p.89 (2008).
Extended cluster model for light and medium nuclei.

2008VaZT A.Vasiliev, H.Ferroukhi, M.A.Zimmermann, E.Kolbe - Proc.Intern.Conf.Nuclear Data for Science and Technology, Nice, France, April 22-27, 2007, O.Bersillon, F.Gunsing, E.Bauge, R.Jacqmin, and S.Leray, Eds., p.965 (2008); EDP Sciences, 2008.
On the observation of discrepancies in the $^{16}O(n,\alpha)$ data between different evaluated nuclear data files.

2008WaZS Y.Watanabe, D.N.Kadrev - Proc.Intern.Conf.Nuclear Data for Science and Technology, Nice, France, April 22-27, 2007, O.Bersillon, F.Gunsing, E.Bauge, R.Jacqmin, and S.Leray, Eds., p.1121 (2008); EDP Sciences, 2008.
Extension of quantum molecular dynamics for production of light complex particles in nucleon-induced reactions.

2008YaZY K.Yamamoto, H.Masui, K.Kato, T.Wada, M.Ohta - Proc.10th,Int.Sym.on Origin of Matter and Evolution of Galaxies 2007 (OMEG07):From the Dawn of Universe to the Formation of Solar System, Sapporo, Japan, December 4-7, 2007, T.Suda, T.Nozawa, A.Ohnishi, K.Kato, M.Y.Fujimoto, T.Kajino, S.Kubono, Eds., p.227 (2008); AIP Conf. Proc. 1016 (2008).
Neutron capture reaction in oxygen nuclei near threshold energy regions.

2009De02 A.Deltuva, A.C.Fonseca - Phys.Rev. C 79, 014606 (2009).
Three-body Faddeev-Alt-Grassberger-Sandhas approach to direct nuclearreactions.

2009De07 A.Deltuva - Phys.Rev. C 79, 021602 (2009).
Three-body direct nuclear reactions: Nonlocal optical potential.

2009Li64 J.Li, J.-M.Yao, J.Meng - Chin.Phys.C 33, Supplement 1, 98 (2009).
Deformation constrained relativistic mean-field approach with fixed configuration and time-odd component.

2009Ma70 H.Makii, Y.Nagai, T.Shima, M.Segawa, K.Mishima, H.Ueda, M.Igashira, T.Ohsaki - Phys.Rev. C 80, 065802 (2009).
E1 and E2 cross sections of the $^{12}C(\alpha,\gamma o)^{16}O$ reaction using pulsed α beams.

2009Mi23 M.Milin, V.V.Ostashko, D.Miljanic, H.G.Bohlen, A.Di Pietro, O.Yu.Goryunov, Tz.Kokalova, M.Lattuada, A.Musumarra, W.von Oertzen, M.G.Pellegriti, S.Romano, S.Thummerer, A.Tumino, M.Zadro - Eur.Phys.J. A 41, 335 (2009).
States in ^{17}O excited in the $^{13}C + {}^{9}Be \rightarrow {}^{13}C + 2\alpha + n$ reaction at 90 MeV.

2009Ru13 A.T.Rudchik, Yu.M.Stepanenko, K.W.Kemper, A.A.Rudchik, O.A.Ponkratenko, E.I.Koshchy, S.Kliczewski, K.Rusek, A.Budzanowski, S.Yu.Mezhevych, Val.M.Pirnak, I.Skwirczynska, R.Siudak, B.Czech, A.Szczurek, V.V.Uleshchenko, J.Choinski, L.Glowacka - Nucl.Phys. A831, 139 (2009).
^{8}Li optical potential from $^{7}Li(^{18}O, {}^{17}O)^{8}Li$ reaction analysis.

2009Ts01 M.B.Tsang, J.Lee, S.C.Su, J.Y.Dai, M.Horoi, H.Liu, W.G.Lynch, S.Warren - Phys.Rev.Lett. 102, 062501 (2009).
Survey of Excited State Neutron Spectroscopic Factors for $Z = 8$-28 Nuclei.

2009Wa17 C.Wang, O.I.Cisse, D.Baye - Phys.Rev. C 80, 034611 (2009).
Parametrization of low-energy cross sections for nonresonant neutron capture.

2009Ya03 K.Yamamoto, H.Masui, J.Kato, T.Wada, M.Ohta - Prog.Theor.Phys.(Kyoto) 121, 375 (2009).
Radiative Capture Cross Section for $^{16}O(n,\gamma)^{17}O$ and $^{16}O(p,\gamma)^{17}F$ below Astrophysical Energies.

2010DaZY A.N.Danilov, T.L.Belyaeva, S.A.Goncharov, A.S.Demyanova, A.A.Ogloblin - Proc.Intern.Symposium Exotic Nuclei, Sochi, (Russia), 28 Sept.–2 Oct.2009, Yu.E.Penionzhkevich, S.M.Lukyanov, Eds., p.88 (2010); AIP Conf.Proc. 1224 (2010).
Determination of the radii of some threshold states in light nuclei and observation of neutron halos in the excited states of ^{13}C and ^{9}Be.

2010De41 A.Deltuva - J.Phys.:Conf.Ser. 205, 012017 (2010).
Few-body nuclear reactions.

REFERENCES FOR A=17(CONTINUED)

2010Ha11 G.Hagen, T.Papenbrock, M.Hjorth-Jensen - Phys.Rev.Lett. 104, 182501 (2010).
Ab Initio Computation of the ^{17}F Proton Halo State and Resonances in A=17 Nuclei.

2010Hu11 J.T.Huang, C.A.Bertulani, V.Guimaraes - At.Data Nucl.Data Tables 96, 824 (2010).
Radiative capture of nucleons at astrophysical energies with single-particle states.

2010La05 C.M.Lavelle, C.-Y.Liu, W.Fox, G.Manus, P.M.McChesney, D.J.Salvat, Y.Shin, M.Makela, C.Morris, A.Saunders, A.Couture, A.R.Young - Phys.Rev. C 82, 015502 (2010).
Ultracold-neutron production in a pulsed-neutron beam line.

2010Mo29 B.J.Mount, H.S.P.Muller, M.Redshaw, E.G.Myers - Phys.Rev. A 81, 064501 (2010).
Mass of ^{17}O from Penning-trap mass spectrometry and molecular spectroscopy: A precision test of the Dunham-Watson model in carbon monoxide.

2010Pr07 B.Pritychenko, S.F.Mughabghab, A.A.Sonzogni - At.Data Nucl.Data Tables 96, 645 (2010).
Calculations of Maxwellian-averaged cross sections and astrophysical reaction rates using the ENDF/B-VII.0, JEFF-3.1, JENDL-3.3, and ENDF/B-VI.8 evaluated nuclear reaction data libraries.

2010Sp01 J.-M.Sparenberg, P.Capel, D.Baye - Phys.Rev. C 81, 011601 (2010).
Influence of low-energy scattering on loosely bound states.

2010YaZW K.Yamamoto, H.Masui, M.Ohta, K.Kato - Proc.Tours Symposium on Nuclear Physics and Astrophysics – VII, Kobe (Japan), 16-20 Nov.2009, H.Susa, M.Arnould, S.Gales, T.Motobayashi, C.Scheidenberger, H.Utsunomiya, Eds. p.205 (2010) AIP Conf.Proc.1238.
Study of ^{16}O(n,γ)^{17}O reaction with core excitation.

2011Ch57 M.B.Chadwick, M.Herman, P.Oblozinsky, M.E.Dunn, Y.Danon, A.C.Kahler, D.L.Smith, B.Pritychenko, G.Arbanas, R.Arcilla, R.Brewer, D.A.Brown, R.Capote, A.D.Carlson, Y.S.Cho, H.Derrien, K.Guber, G.M.Hale, S.Hoblit, S.Holloway, T.D.Johnson, T.Kawano, B.C.Kiedrowski, H.Kim, S.Kunieda, N.M.Larson, L.Leal, J.P.Lestone, R.C.Little, E.A.McCutchan, R.E.MacFarlane, M.MacInnes, C.M.Mattoon, R.D.McKnight, S.F.Mughabghab, G.P.A.Nobre, G.Palmiotti, A.Palumbo, M.T.Pigni, V.G.Pronyaev, R.O.Sayer, A.A.Sonzogni, N.C.Summers, P.Talou, I.J.Thompson, A.Trkov, R.L.Vogt, S.C.van der Marck, A.Wallner, M.C.White, D.Wiarda, P.G.Young - Nucl.Data Sheets 112, 2887 (2011).
ENDF/B-VII.1 Nuclear Data for Science and Technology: Cross Sections,Covariances, Fission Product Yields and Decay Data.

2011KhZW V.A.Khryachkov, I.P.Bondarenko, B.D.Kuzminov, N.N.Semenova, A.I.Sergachev - Proc.18th Intern.Seminar on Int.of Neutrons with Nuclei, Dubna, Russia, May 26-29, 2010 p.153 (2011).
Study of (n,α) Reaction Cross Section on a Set of Light Nuclei.

2011Ko29 K.Kondo, I.Murata, K.Ochiai, N.Kubota, H.Miyamaru, C.Konno, T.Nishitani - J.Nucl.Sci.Technol.(Tokyo) 48, 1146 (2011).
Measurement of Charged-Particle Emission Double-Differential Cross Section of Fluorine for 14.2 MeV Neutrons.

2011Og09 A.A.Ogloblin, A.N.Danilov, T.L.Belyaeva, A.S.Demyanova, S.A.Goncharov, W.Trzaska - Phys.Atomic Nuclei 74, 1548 (2011); Yad.Fiz. 74, 1581 (2011).
Observation of abnormally large radii of nuclei in excited states in the vicinity of neutron thresholds.

2011Og10 A.A.Ogloblin, A.N.Danilov, T.L.Belyaeva, A.S.Demyanova, S.A.Goncharov, W.Trzaska - Phys.Rev. C 84, 054601 (2011).
Effect of neutron halos on excited states of nuclei.

2011Pr03 B.Pritychenko, E.Betak, M.A.Kellett, B.Singh, J.Totans - Nucl.Instrum.Methods Phys.Res. A640, 213 (2011).
The Nuclear Science References (NSR) database and Web Retrieval System.

2011Sl01 B.W.Sleaford, N.Summers, J.Escher, R.B.Firestone, S.Basunia, A.Hurst,M.Krticka, G.Molnar, T.Belgya, Zs.Revay, H.D.Choi - J.Korean Phys.Soc. 59, 1473s (2011).
Capture Gamma-ray Libraries for Nuclear Applications.

2011Ti09 L.J.Titus, P.Capel, F.M.Nunes - Phys.Rev. C 84, 035805 (2011).
Asymptotic normalization of mirror states and the effect of couplings.

2012Fu06 T.Fujita, S.Oshima - J.Phys.(London) G39, 095106 (2012).
Electric dipole moments of neutron-odd nuclei.

2012Gu18 B.Guo, Z.H.Li, M.Lugaro, J.Buntain, D.Y.Pang, Y.J.Li, J.Su, S.Q.Yan, X.X.Bai, Y.S.Chen, Q.W.Fan, S.J.Jin, A.I.Karakas, E.T.Li, Z.C.Li, G.Lian, J.C.Liu, X.Liu, J.R.Shi, N.C.Shu, B.X.Wang, Y.B.Wang, S.Zeng, W.P.Liu - Astrophys.J. 756, 193 (2012).
New Determination of the ^{13}C(α,n)^{16}O Reaction Rate and its Influence on the s-process Nucleosynthesis in AGB Stars.

2012Kh05 V.A.Khryachkov, I.P.Bondarenko, T.A.Ivanova, B.D.Kuzminov, N.N.Semenova, A.I.Sergachev - Bull.Rus.Acad.Sci.Phys. 76, 486 (2012); Izv.Akad.Nauk RAS, Ser.Fiz 76, 544 (2012).
Experimental studies of (n, α) reaction cross-sections performed at the Institute for Physics and Power Engineering.

2012Kh06 V.A.Khryachkov, I.P.Bondarenko, B.D.Kuzminov, N.N.Semenova, A.I.Sergachev - Phys.Atomic Nuclei 75, 404 (2012); Yad.Fiz. 75, 438 (2012).
Measurement of the cross section for the reaction ^{20}Ne(n,α)^{17}Oin the neutron-energy between 4 and 7 MeV.

2012KhZZ V.A.Khryachkov, I.P.Bondarenko, B.D.Kuzminov, N.N.Semenova, A.I.Sergachev, T.A.Ivanova, G.Giorginis - Proc.3rd International Workshop on Compound-Nuclear Reactions and Related Topics, Prague, Czech Republic, September 19-23, 2011, M.Krticka, F.Becvar, J.Kroll, Eds.p.03005 (2012).
(n,α) reactions cross section research at IPPE.

REFERENCES FOR A=17(CONTINUED)

2012La29 M.La Cognata, C.Spitaleri, O.Trippella, G.G.Kiss, G.V.Rogachev, A.M.Mukhamedzhanov, M.Avila, G.L.Guardo, E.Koshchiy, A.Kuchera, L.Lamia, S.M.R.Puglia, S.Romano, D.Santiago, R.Sparta - Phys.Rev.Lett. 109, 232701 (2012).
Measurement of the −3 keV Resonance in the Reaction $^{13}C(\alpha,n)^{16}O$ of Importance in the s-Process.

2012Mi24 A.Mishra, D.N.Basu - Rom.J.Phys. 57, 1317 (2012).
Nuclear Reaction Rates and the Primordial Nucleosynthesis.

2012Mu14 A.M.Mukhamedzhanov - Phys.Rev. C 86, 044615 (2012).
Coulomb renormalization and ratio of proton and neutron asymptotic normalization coefficients for mirror nuclei.

2012Ok02 J.Okolowicz, N.Michel, W.Nazarewicz, M.Ploszajczak - Phys.Rev. C 85, 064320 (2012).
Asymptotic normalization coefficients and continuum coupling in mirror nuclei.

2012Pa34 V.Paneta, M.Kokkoris, A.Lagoyannis, V.Rakopoulos - Nucl.Instrum.Methods Phys.Res. B290, 72 (2012).
Differential cross-section measurements of the d + ^{19}F reaction channels for NRA purposes.

2012Pr13 B.Pritychenko, S.F.Mughabghab - Nucl.Data Sheets 113, 3120 (2012).
Neutron Thermal Cross Sections, Westcott Factors, Resonance Integrals, Maxwellian Averaged Cross Sections and Astrophysical Reaction Rates Calculated from the ENDF/B-VII.1, JEFF-3.1.2, JENDL-4.0, ROSFOND-2010, CENDL-3.1 and EAF-2010 Evaluated Data Libraries.

2012PrZY L.Prepolec, M.Freer, N.I.Ashwood, N.Curtis, A.Di Pietro, P.Figuera, M.Fisichella, L.Grassi, D.Jelavic Malenica, Tz.Kokalova, T.Mijatovic, M.Milin, V.Scuderi, N.Skukan, N.Soic, S.Szilner, V.Tokic, D.Torresi, C.Wheldon - Proc.Intern.Conf.on Nuclear Structure and Dynamics,12, Opatija, Croatia, 9-13 July, 2012, T.Niksic, M.Milin, D.Vretenar, S.Szilner, Eds., p.19 (2012); AIP Conf.Proc.1491 (2012).
$^{13}C+^{4}He$ resonant elastic scattering on a thick gas target.

2012Ra29 M.Rashdan - Int.J.Mod.Phys. E21, 1250083 (2012).
Structure and reactions of neutron-rich oxygen isotopes.

2012Sa50 W.Satula, J.Dobaczewski, W.Nazarewicz, T.R.Werner - Phys.Rev. C 86, 054316 (2012).
Isospin-breaking corrections to superallowed Fermi β decay in isospin- and angular-momentum-projected nuclear density functional theory.

2012Th01 M.Thoennessen - At.Data Nucl.Data Tables 98, 43 (2012).
Discovery of isotopes with $Z \leq 10$.

2012Wa16 J.C.Walpe, U.Garg, S.Naguleswaran, J.Wei, W.Reviol, I.Ahmad, M.P.Carpenter, T.L.Khoo - Phys.Rev. C 85, 057302 (2012).
Lifetime measurements in $^{182,186}Pt$.

2012We11 J.Wei, J.Li, J.Meng - Prog.Theor.Phys.(Kyoto), Suppl. 196, 400 (2012).
Relativistic Descriptions of Nuclear Magnetic Moments.

2012Xu09 Y.Xu, S.Goriely - Phys.Rev. C 86, 045801 (2012).
Systematic study of direct neutron capture.

2012Yu07 C.Yuan, T.Suzuki, T.Otsuka, F.Xu, N.Tsunoda - Phys.Rev. C 85, 064324 (2012).
Shell-model study of boron, carbon, nitrogen, and oxygen isotopes with a monopole-based universal interaction.

2013Al14 T.Al Kalanee, J.Gibelin, P.Roussel-Chomaz, N.Keeley, D.Beaumel, Y.Blumenfeld, B.Fernandez-Dominguez, C.Force, L.Gaudefroy, A.Gillibert, J.Guillot, H.Iwasaki, S.Krupko, V.Lapoux, W.Mittig, X.Mougeot, L.Nalpas, E.Pollacco, K.Rusek, T.Roger, H.Savajols, N.de Sereville, S.Sidorchuk, D.Suzuki, I.Strojek, N.A.Orr - Phys.Rev. C 88, 034301 (2013).
Structure of unbound neutron-rich ^{9}He studied using single-neutrontransfer.

2013De06 M.De Rydt, M.Depuydt, G.Neyens - At.Data Nucl.Data Tables 99, 391 (2013).
Evaluation of the ground-state quadrupole moments of the $\pi(sd)$ nuclei.

2013Du15 S.Dubovichenko, A.Dzhazairov-Kakhramanov, N.Afanasyeva - Int.J.Mod.Phys. E22, 1350075 (2013).
Radiative Neutron Capture on ^{9}Be ^{14}C, ^{14}N, ^{15}N and ^{16}Oat thermal and astrophysical energies.

2013Du16 S.B.Dubovichenko - Physics of Part.and Nuclei 44, 803 (2013).
Neutron capture by light nuclei at astrophysical energies.

2013Fo09 H.T.Fortune, R.Sherr - Eur.Phys.J. A 49, 26 (2013).
Matter radii of $^{17-24}O$.

2013He11 A.Hernandez-Solis, C.Demaziere, C.Ekberg - Ann.Nucl.Energy 57, 230 (2013).
Uncertainty and sensitivity analyses applied to the DRAGONv4.05 code lattice calculations and based on JENDL-4 data.

2013Ti04 N.K.Timofeyuk, R.C.Johnson - Phys.Rev. C 87, 064610 (2013).
Nonlocality in the adiabatic model of A(d,p)B reactions.

2013Ue01 H.Ueno, H.Miyatake, Y.Yamamoto, S.Tanimoto, T.Shimoda, N.Aoi, K.Asahi, E.Ideguchi, M.Ishihara, H.Izumi, T.Kishida, T.Kubo, S.Mitsuoka, Y.Mizoi, M.Notani, H.Ogawa, A.Ozawa, M.Sasaki, T.Shirakura, N.Takahashi, K.Yoneda - Phys.Rev. C 87, 034316 (2013).
β-delayed neutron and γ-ray spectroscopy of ^{17}C utilizing spin-polarized ^{17}B.

2014Ac01 O.I.Achakovskiy, S.P.Kamerdzhiev, E.E.Saperstein, S.V.Tolokonnikov - Eur.Phys.J. A 50, 6 (2014).
Magnetic moments of odd-odd spherical nuclei.

2014Al05 T.Al-Abdullah, F.Carstoiu, X.Chen, H.L.Clark, C.A.Gagliardi, Y.-W.Lui, A.Mukhamedzhanov, G.Tabacaru, Y.Tokimoto, L.Trache, R.E.Tribble, Y.Zhai - Phys.Rev. C 89, 025809 (2014).
Astrophysical reaction rate for $^{17}F(p,\gamma)^{18}Ne$ from the transferreaction $^{13}C(^{17}O,^{18}O)^{12}C$.

REFERENCES FOR A=17(CONTINUED)

2014Al11 T.Al-Abdullah, F.Carstoiu, C.A.Gagliardi, G.Tabacaru, L.Trache, R.E.Tribble - Phys.Rev. C 89, 064602 (2014).
Peripheral elastic and inelastic scattering of ^{17,18}O on light targets at 12 MeV/nucleon.

2014Ba35 S.Bailey, M.Freer, Tz.Kokalova, S.Cruz, H.Floyd, D.J.Parker - Phys.Rev. C 90, 024302 (2014).
Energy levels of ^{18}F from the ^{14}N+α resonant reaction.

2014El01 M.N.El-Hammamy, A.Attia, F.A.El-Akkad, A.M.Abdel-Moneim - Chin.Phys.C 38, 034102 (2014).
Study of ^{3}He inelastic scattering on ^{13}C and ^{14}C at 37.9 MeV.

2014Ho08 C.R.Hoffman, B.P.Kay, J.P.Schiffer - Phys.Rev. C 89, 061305 (2014).
Neutron s states in loosely bound nuclei.

2014Jo02 R.C.Johnson, N.K.Timofeyuk - Phys.Rev. C 89, 024605 (2014).
Adiabatic model of (d,p) reactions with explicitly energy-dependent nonlocal potentials.

2014Ku13 S.Kunieda, T.Kawano, M.Paris, G.Hale, K.Shibata, T.Fukahori - Nucl.Data Sheets 118, 250 (2014).
R-matrix Analysis for n +^{16}O Cross-sections up to E_n=6.0 MeV with Covariances.

2014LaZU M.La Cognata, C.Spitaleri, O.Trippella, G.G.Kiss, G.V.Rogachev, A.M.Mukhamedzhanov, M.Avila, G.L.Guardo, E.Koshchiy, A.Kuchera, L.Lamia, S.M.R.Puglia, S.Romano, D.Santiago, R.Sparta - Int.Nuclear Physics Conf. 2013, (IUPAP), Firenze,Italy, June 2-7,2013, S.Lunardi, P.G.Bizzeti, W.S.Kabana, C.Bucci,et al.Eds.p.07010 (2014); EPJ web of Conf.v.66, (2014).
Measurement of the ^{13}C(α, n)^{16}O reaction at astrophysical energies using the Trojan Horse Method. Focus on the −3 keV sub-threshold resonance.

2014Mu10 A.M.Mukhamedzhanov, D.Y.Pang, C.A.Bertulani, A.S.Kadyrov - Phys.Rev. C 90, 034604 (2014).
Surface-integral formalism of deuteron stripping.

2014My05 N.A.Mynbayev, A.K.Nurmukhanbetova, V.Z.Goldberg, M.S.Golovkov, G.V.Rogachev, V.N.Dzyubin, M.V.Koloberdin, I.A.Ivanov, R.E.Tribble - J.Exper.Theo.Phys. 119, 663 (2014); Zh.Eksp.Teor.Fiz. 146, 754 (2014).
Study of the excitation function for the ^{13}C + ^{4}He elastic scattering with the thick-target inverse kinematics method.

2014Ru01 A.T.Rudchik, S.Kliczewski, K.A.Chercas, K.W.Kemper, E.I.Koshchy, K.Rusek, A.A.Rudchik, S.Yu.Mezhevych, V.M.Pirnak, V.A.Plujko, O.A.Ponkratenko, J.Choinski, B.Czech, R.Siudak, A.Szczurek, A.Stolarz, R.M.Zelinskyi - Nucl.Phys. A922, 71 (2014).
Elastic and inelastic scattering of ^{6}Li + ^{18}O versus ^{7}Li + ^{18}O and ^{6}Li + ^{16}O.

2014Ru06 A.T.Rudchik, K.A.Chercas, K.W.Kemper, A.A.Rudchik, S.Kliczewski, E.I.Koshchy, K.Rusek, S.Yu.Mezhevych, O.A.Ponkratenko, Val.M.Pirnak, V.A.Plujko, J.Choinski, B.Czech, R.Siudak, A.Szczurek - Nucl.Phys. A927, 209 (2014).
^{6}Li(^{18}O,^{17}O)^{7}Li reaction and comparison of ^{6,7}Li + ^{16,17,18}O potentials.

2014Xu09 Y.Xu, S.Goriely, A.J.Koning, S.Hilaire - Phys.Rev. C 90, 024604 (2014).
Systematic study of neutron capture including the compound, pre-equilibrium, and direct mechanisms.

2015Av02 M.L.Avila, G.V.Rogachev, E.Koshchiy, L.T.Baby, J.Belarge, K.W.Kemper,A.N.Kuchera, D.Santiago-Gonzalez - Phys.Rev. C 91, 048801 (2015).
New measurement of the α asymptotic normalization coefficient of the1/2^{+} state in ^{17}O at 6.356 MeV that dominates the ^{13}C(α,n)^{16}O reaction rate at temperatures relevant for the s process.

2015De38 A.Deltuva - Phys.Rev. C 92, 064613 (2015).
Faddeev-type calculation of (d,n) transfer reactions in three-body nuclear systems.

2015Fa12 T.Faestermann, P.Mohr, R.Hertenberger, H.-F.Wirth - Phys.Rev. C 92, 052802 (2015).
Broad levels in ^{17}O and their relevance for the astrophysical s process.

2015Fa13 T.Faestermann - Phys.Scr. T166, 014003 (2015).
Lifetime measurements of nuclei in few-electron ions.

2015Gr14 J.Grinyer, G.F.Grinyer, M.Babo, H.Bouzomita, P.Chauveau, P.Delahaye, M.Dubois, R.Frigot, P.Jardin, C.Leboucher, L.Maunoury, C.Seiffert, J.C.Thomas, E.Traykov - Phys.Rev. C 92, 045503 (2015).
High-precision half-life measurements of the T=1/2 mirror β decays ^{17}F and ^{33}Cl.

2015LaZW M.La Cognata, G.G.Kiss, A.M.Mukhamedzhanov, C.Spitaleri, O.Trippella - Proc.Intern.Conf.on Nuclear Structure and Dynamics,15, Portoroz, Slovenia, 14-19 June 2015, M.Lipoglavsek , Matko Milin , T.Niksic , S.Szilner, D.Vretenar, Eds., p.050002 (2015); AIP Conf.Proc.1681 (2015).
Investigating resonances above and below the threshold in nuclear reactions of astrophysical interest and beyond.

2015Pa05 S.S.Pankratov, M.Baldo, E.E.Saperstein - Phys.Rev. C 91, 015802 (2015).
$^{1}S_0$ pairing for neutrons in dense neutron matter induced by a soft pion.

2015Pa10 D.Y.Pang, W.M.Dean, A.M.Mukhamedzhanov - Phys.Rev. C 91, 024611 (2015).
Optical model potential of A=3 projectiles for 1p-shell nuclei.

2015Pi05 K.Piasecki, for the FOPI Collaboration - Phys.Rev. C 91, 054904 (2015).
Influence of ϕ mesons on negative kaons in Ni + Ni collisions at 1.91A GeV beam energy.

2015Ru04 K.Rusek, N.Keeley, K.W.Kemper, A.T.Rudchik - Phys.Rev. C 91, 044612 (2015).
Effect of the exit reaction channels on ^{6}Li+^{18}O elastic scattering.

2015Sa01 M.Salvatores, G.Aliberti, G.Palmiotti - Nucl.Data Sheets 123, 68 (2015).
The Role of Uncertainty Quantification for Reactor Physics.

2015St03 N.J.Stone - Hyperfine Interactions 230, 7 (2015).
New table of recommended nuclear electric quadrupole moments.

2015To02 I.S.Towner, J.C.Hardy - Phys.Rev. C 91, 015501 (2015).

REFERENCES FOR A=17(CONTINUED)

Parametrization of the statistical rate function for select superallowed transitions.

2015Vl01 G.N.Vlaskin, Yu.S.Khomyakov, V.I.Bulanenko - At.Energ. 117, 357 (2015).
Neutron Yield of the Reaction (α, n) on Thick Targets Comprised of Light Elements.

2015Vo02 V.T.Voronchev - Phys.Rev. C 91, 028801 (2015).
Nonthermal nuclear reactions induced by fast α particles in the solar core.

2015Wa19 Z.Wang, Z.Ren, T.Dong, X.Guo - Phys.Rev. C 92, 014309 (2015).
Quenching of magnetic form factors of s-d shell nuclei ^{17}O, ^{25}Mg, ^{27}Al, ^{29}Si, and ^{31}P within the relativistic mean field model.

2015Zh13 S.-S.Zhang, J.-P.Peng, M.S.Smith, G.Arbanas, R.L.Kozub - Phys.Rev. C 91, 045802 (2015).
Exploration of direct neutron capture with covariant density functional theory inputs.

2016Br01 M.Brodeur, C.Nicoloff, T.Ahn, J.Allen, D.W.Bardayan, F.D.Becchetti, Y.K.Gupta, M.R.Hall, O.Hall, J.Hu, J.M.Kelly, J.J.Kolata, J.Long, P.O′Malley, B.E.Schultz - Phys.Rev. C 93, 025503 (2016).
Precision half-life measurement of ^{17}F.

2016Cs02 L.Csedreki, Z.Halasz, A.Z.Kiss - Nucl.Instrum.Methods Phys.Res. B380, 1 (2016).
Assessment of experimental d-PIGE γ-ray production cross sections for ^{12}C, ^{14}N and ^{16}O and comparison with absolute thick target yields.

2016De31 A.Deltuva, D.Jurciukonis - Phys.Rev. C 94, 054619 (2016).
Calculation of three-body nuclear reactions with angular-momentum andparity-dependent optical potentials.

2016De38 G.De Gregorio, F.Knapp, N.Lo Iudice, P.Vesely - Phys.Rev. C 94, 061301 (2016).
Microscopic multiphonon method for odd nuclei and its application to ^{17}O.

2016Fi04 R.B.Firestone, Zs.Revay - Phys.Rev. C 93, 044311 (2016).
Thermal neutron capture cross sections for $^{16,17,18}O$ and ^{2}H.

2016Ho14 C.R.Hoffman, B.P.Kay, J.P.Schiffer - Phys.Rev. C 94, 024330 (2016).
Ordering of the $0d_{5/2}$ and $1s_{1/2}$ proton levels in light nuclei.

2016La06 M.La Cognata, C.Spitaleri, S.Cherubini, M.Gulino, O.Trippella, A.Tumino - Acta Phys.Pol. B47, 681 (2016).
Using the Trojan Horse Method to Investigate Resonances Above and Below the Threshold in Nuclear Reactions of Astrophysical Interest.

2016LeZV H.Y.Lee, S.Mosby, R.C.Haight, M.C.White - 5th Int.Workshop on Compound-Nuclear Reactions and Related Topics, Tokyo, Japan, October 19-23, 2015, T.Kawano, et al.(Eds.), p.05004 (2016); EPJ Web of Conf. v.122 (2016).
$^{16}O(n,\alpha)$ cross section investigation using LENZ instrument at LANSCE.

2016Mo23 P.Mohr, C.Heinz, M.Pignatari, I.Dillmann, A.Mengoni, F.Kappeler - Astrophys.J. 827, 29 (2016).
Re-evaluation of the $^{16}O(N,\gamma)^{17}O$ Cross Section at Astrophysical Energies and Its Role as a Neutron Poison in the s-process.

2016Pa05 F.Pan, X.Ding, K.D.Launey, H.Li, X.Xu, J.P.Draayer - Nucl.Phys. A947, 234 (2016).
An exactly solvable spherical mean-field plus extended monopole pairing model.

2016Ra06 H.Rafi-kheiri, O.Kakuee, M.Lamehi-Rachti - Nucl.Instrum.Methods Phys.Res. B371, 46 (2016).
Differential cross section measurement of $^{16}O(d,p_{0,1})$ reactionsat energies and angles relevant to NRA.

2016Sp03 C.Spitaleri, M.La Cognata, L.Lamia, A.M.Mukhamedzhanov, R.G.Pizzone - Eur.Phys.J. A 52, 77 (2016).
Nuclear astrophysics and the Trojan Horse Method.

2016St14 N.J.Stone - At.Data Nucl.Data Tables 111-112, 1 (2016).
Table of nuclear electric quadrupole moments.

2016Ti02 L.J.Titus, F.M.Nunes, G.Potel - Phys.Rev. C 93, 014604 (2016).
Explicit inclusion of nonlocality in (d,p) transfer reactions.

2017Ah08 S.Ahmad, A.A.Usmani, Z.A.Khan - Phys.Rev. C 96, 064602 (2017).
Matter radii of light proton-rich and neutron-rich nuclear isotopes.

2017Ch32 K.A.Chipps - Nucl.Instrum.Methods Phys.Res. B407, 297 (2017); Reprint Nucl.Instrum.Methods Phys.Res. B414, 199 (2018).
Reaction measurements with the Jet Experiments in Nuclear Structure and Astrophysics (JENSA) gas jet target.

2017De08 G.De Gregorio, F.Knapp, N.Lo Iudice, P.Vesely - Phys.Rev. C 95, 034327 (2017).
Low- and high-energy spectroscopy of ^{17}O and ^{17}F within a microscopic multiphonon approach.

2017De20 A.Deltuva - Few-Body Systems 58, 47 (2017).
Nucleon Transfer Reactions in Few-Body Nuclear Systems.

2017HaZY G.M.Hale, M.W.Paris - Proc.Intern.Conf.Nuclear Data for Science and Technology (ND2016), Bruges, Belgium, September 11-16, 2016,A.Plompen, et al, Ed. p.02027, (2017);EPJ Web of Conf., Vol.146 Pt.1, 2017.
Neutron cross sections for carbon and oxygen from new R-matrix analyses of the 13,14C and 17O systems.

2017Ka02 A.Kaur, M.K.Sharma - Nucl.Phys. A957, 274 (2017).
Competing analysis of α and 2p2n-emission from compound nuclei formed in neutron induced reactions.

2017Ko31 E.Koshchiy, J.C.Blackmon, G.V.Rogachev, I.Wiedenhover, L.Baby, P.Barber, D.W.Bardayan, J.Belarge, D.Caussyn, E.D.Johnson, K.Kemper, A.N.Kuchera, L.E.Linhardt, K.T.Macon, M.Matos, B.S.Rasco, D.Santiago-Gonzalez - Nucl.Instrum.Methods Phys.Res. A870, 1 (2017).
ANASEN: The array for nuclear astrophysics and structure with exotic nuclei.

2017Me04 S.Yu.Mezhevych, A.T.Rudchik, A.A.Rudchik, O.A.Ponkratenko, N.Keeley, K.W.Kemper, M.Mazzocco, K.Rusek, S.B.Sakuta - Phys.Rev. C 95, 034607 (2017).
Cluster structure of ^{17}O.

REFERENCES FOR A=17(CONTINUED)

2017Mu14 A.M.Mukhamedzhanov, Shubhchintak, C.A.Bertulani - Phys.Rev. C 96, 024623 (2017).
Subthreshold resonances and resonances in the R-matrix method for binary reactions and in the Trojan horse method.

2017Ol06 K.Olimov, K.G.Gulamov, K.K.Olimov, S.L.Lutpullaev, V.V.Lugovoy, B.S.Yuldashev, A.K.Olimov - Int.J.Mod.Phys. E26, 1750066 (2017).
Partial and full inelasticity coefficients in ^{16}Op-collisions at 3.25 AGeV/c.

2017Pa45 S.Palmerini, O.Trippella, M.Busso, D.Vescovi, M.Petrelli, A.Zucchini,F.Frondini - Geochim.Cosmochim.Act. 221, 21 (2017).
s-Processing from MHD-induced mixing and isotopic abundances in presolar SiC grains.

2017Pe13 W.A.Peters - Phys.Rev. C 96, 029801 (2017).
Comment on "Cross section of the ^{13} (α, n) ^{16}O reaction: A background for the measurement of geo-neutrinos".

2017Sa48 A.Saxena, P.C.Srivastava - Phys.Rev. C 96, 024316 (2017).
First-principles results for electromagnetic properties of sd shell nuclei.

2017Sh51 P.Sharma - Nucl.Phys. A968, 326 (2017).
Role of nuclear charge change and nuclear recoil on shaking processesand their possible implication on physical processes.

2017Sv01 J.P.Svenne, L.Canton, K.Amos, P.R.Fraser, S.Karataglidis, G.Pisent, D.van der Knijff - Phys.Rev. C 95, 034305 (2017).
Very low-energy nucleon-^{16}O coupled-channel scattering: Results with a phenomenological vibrational model.

2017Ti04 Y.-J.Tian, T.-H.Heng, Z.-M.Niu, Q.Liu, J.-Y.Guo - Chin.Phys.C 41, 044104 (2017).
Exploration of resonances by using complex momentum representation.

2017Tr03 O.Trippella, M.La Cognata - Astrophys.J. 837, 41 (2017).
Concurrent Application of ANC and THM to assess the ^{13}C$(\alpha, n)^{16}$O Absolute Cross Section at Astrophysical Energies and Possible Consequences for Neutron Production in Low-mass AGB Stars.

2017Vo11 V.T.Voronchev, Y.Nakao, Y.Watanabe - Phys.Rev. C 96, 055803 (2017).
Comparative roles of pp chain reactions as a trigger for suprathermalprocesses in the solar core.

2017Wa10 M.Wang, G.Audi, F.G.Kondev, W.J.Huang, S.Naimi, X.Xu - Chin.Phys.C 41, 030003 (2017).
The AME2016 atomic mass evaluation (II). Tables, graphs and references.

2018Al08 A.A.Alzubadi, R.A.Radhi, N.S.Manie - Phys.Rev. C 97, 024316 (2018).
Shell model and Hartree-Fock calculations of longitudinal and transverse electroexcitation of positive and negative parity states in ^{17}O.

2018Ay04 M.Aygun - Int.J.Mod.Phys. E27, 1850055 (2018).
Analysis with SDHO and RMF density distributions of elastic scattering cross-sections of oxygen isotopes (16-18) by various target nuclei.

2018Br05 D.A.Brown, M.B.Chadwick, R.Capote, A.C.Kahler, A.Trkov, M.W.Herman, A.A.Sonzogni, Y.Danon, A.D.Carlson, M.Dunn, D.L.Smith, G.M.Hale, G.Arbanas, R.Arcilla, C.R.Bates, B.Beck, B.Becker, F.Brown, R.J.Casperson, J.Conlin, D.E.Cullen, M.-A.Descalle, R.Firestone, T.Gaines, K.H.Guber, A.I.Hawari, J.Holmes, T.D.Johnson, T.Kawano, B.C.Kiedrowski, A.J.Koning, S.Kopecky, L.Leal, J.P.Lestone, C.Lubitz, J.I.Marquez Damian, C.M.Mattoon, E.A.McCutchan, S.Mughabghab, P.Navratil, D.Neudecker, G.P.A.Nobre, G.Noguere, M.Paris, M.T.Pigni, A.J.Plompen, B.Pritychenko, V.G.Pronyaev, D.Roubtsov, D.Rochman, P.Romano, P.Schillebeeckx, S.Simakov, M.Sin, I.Sirakov, B.Sleaford, V.Sobes, E.S.Soukhovitskii, I.Stetcu, P.Talou, I.Thompson, S.van der Marck, L.Welser-Sherrill, D.Wiarda, M.White, J.L.Wormald, R.Q.Wright, M.Zerkle, G.Zerovnik, Y.Zhu - Nucl.Data Sheets 148, 1 (2018).
ENDF/B-VIII.0: The 8 th Major Release of the Nuclear Reaction Data Library with CIELO-project Cross Sections, New Standards and Thermal Scattering Data.

2018Cr02 S.Cristallo, M.La Cognata, C.Massimi, A.Best, S.Palmerini, O.Straniero, O.Trippella, M.Busso, G.F.Ciani, F.Mingrone, L.Piersanti, D.Vescovi - Astrophys.J. 859, 105 (2018).
The Importance of the ^{13}C$(\alpha,n)^{16}$O Reaction in Asymptotic GiantBranch Stars.

2018Do02 J.M.Dong, Y.H.Zhang, W.Zuo, J.Z.Gu, L.J.Wang, Y.Sun - Phys.Rev. C 97, 021301 (2018).
Generalized isobaric multiplet mass equation and its application to the Nolen-Schiffer anomaly.

2018Fo04 H.T.Fortune - Phys.Rev. C 97, 034301 (2018).
Mirror energy differences of $2s_{1/2}$, $1d_{5/2}$ and $1f_{7/2}$ states.

2018Fo12 H.T.Fortune - Phys.Rev. C 97, 054309 (2018).
Update on matter radii of $^{17-24}$O.

2018Gu11 X.Guo, J.Liu, Z.Wang, Z.Chi - Nucl.Phys. A978, 1 (2018).
Investigation of nonlinear isoscalar-isovector coupling in a relativistic mean-field model by elastic magnetic electron scattering.

2018Ji07 W.G.Jiang, B.S.Hu, Z.H.Sun, F.R.Xu - Phys.Rev. C 98, 044320 (2018).
Gogny-force-derived effective shell-model Hamiltonian.

2018Ke03 N.Keeley, K.W.Kemper, K.Rusek - Eur.Phys.J. A 54, 71 (2018).
A cautionary tale: The Coulomb modified ANC for the $1/2^+_2$ state in ^{17}O.

2018Li56 W.Li, G.Potel, F.Nunes - Phys.Rev. C 98, 044621 (2018).
Nonlocal interactions in the (d,p) surrogate method for (n,γ) reactions.

2018Li59 R.Linares, M.J.Ermamatov, J.Lubian, F.Cappuzzello, D.Carbone, E.N.Cardozo, M.Cavallaro, J.L.Ferreira, A.Foti, A.Gargano, B.Paes, G.Santagati, V.A.B.Zagatto - Phys.Rev. C 98, 054615 (2018).
Analysis of the one-neutron transfer to ^{16}O, ^{28}Si, and ^{64}Ni induced by the (^{18}O, ^{17}O) reaction at 84 MeV.

2018Mo15 P.Mohr - Phys.Rev. C 97, 064613 (2018).

REFERENCES FOR A=17(CONTINUED)

Revised cross section of the $^{13}C(\alpha,n)^{16}O$ reaction between 5 and 8 MeV.
2018Sc04 M.Schulc, M.Kostal, D.Harutyunyan, E.Novak - Appl.Radiat.Isot. 133, 45 (2018).
Disentangling the ^{16}O cross section using light water and heavy water benchmark assemblies.
2018Sm01 K.Smith, T.Baugher, S.Burcher, A.B.Carter, J.A.Cizewski, K.A.Chipps, M.Febbraro, R.Grzywacz, K.L.Jones, S.Munoz, S.D.Pain, S.V.Paulauskas, A.Ratkiewicz, K.T.Schmitt, C.Thornsberry, R.Toomey, D.Walter, H.Willoughby - Nucl.Instrum.Methods Phys.Res. B414, 190 (2018).
First data with the Hybrid Array of Gamma Ray Detector (HAGRiD).
2018Ti08 A.Tichai, E.Gebrerufael, K.Vobig, R.Roth - Phys.Lett. B 786, 448 (2018).
Open-shell nuclei from No-Core Shell Model with perturbative improvement.
2018Ze01 V.V.Zerkin, B.Pritychenko - Nucl.Instrum.Methods Phys.Res. A888, 31 (2018).
The experimental nuclear reaction data (EXFOR): Extended computer database and Web retrieval system.
2019Fo08 H.T.Fortune - Phys.Rev. C 99, 034309 (2019).
Ratios of matter radii for isotopes of light nuclei.
2019Ma31 T.L.Ma, B.Guo, Z.H.Li, Y.J.Li, D.Y.Pang, Y.L.Han, Y.P.Shen, J.Su, J.C.Liu, Q.W.Fan, Z.Y.Han, X.Y.Li, G.Lian, Y.Su, Y.B.Wang, S.Q.Yan, S.Zeng, W.P.Liu - Nucl.Phys. A986, 26 (2019).
Precision measurement of the angular distribution for the $^{16}O(d, p)^{17}O$ transfer reaction to the ground state of ^{17}O.
2019Mu05 A.M.Mukhamedzhanov - Phys.Rev. C 99, 024311 (2019).
Connection between asymptotic normalization coefficients and resonance widths of mirror states.
2019Ra09 M.Rashdan, Sh.Sewailem - Phys.Rev. C 99, 034604 (2019).
Effects of in-medium NN cross section and density distribution on thereaction cross sections of Ne, Mg, and O isotopes with ^{12}C at 1 GeV.
2019Sa02 G.Saxena, M.Kumawat, M.Kaushik, S.K.Jain, M.Aggarwal - Phys.Lett. B 788, 1 (2019).
Bubble structure in magic nuclei.
2019Sa21 P.Sarriguren, D.Merino, O.Moreno, E.Moya de Guerra, D.N.Kadrev, A.N.Antonov, M.K.Gaidarov - Phys.Rev. C 99, 034325 (2019).
Elastic magnetic electron scattering from deformed nuclei.
2019Sh35 Shubhchintak, P.Descouvemont - Phys.Rev. C 100, 034611 (2019).
Transfer reactions with the Lagrange-mesh method.
2019Sm04 N.A.Smirnova, B.R.Barrett, Y.Kim, I.J.Shin, A.M.Shirokov, E.Dikmen, P.Maris, J.P.Vary - Phys.Rev. C 100, 054329 (2019).
Effective interactions in the sd shell.
2019StZV N.J.Stone - INDC(NDS)−0794 (2019).
Table of Recommended Nuclear Magnetic Dipole Moments: Part I – Long-lived States.
2019Ti04 A.Tichai, J.Muller, K.Vobig, R.Roth - Phys.Rev. C 99, 034321 (2019).
Natural orbitals for ab initio no-core shell model calculations.
2019Xu05 Y.Xu, Y.Han, H.Liang, Z.Wu, H.Guo, C.Cai - Phys.Rev. C 99, 034618 (2019).
Global optical model potential for the weakly bound projectile ^{9}Be.
2020An13 R.An, L.-S.Geng, S.-S.Zhang - Phys.Rev. C 102, 024307 (2020).
Novel ansatz for charge radii in density functional theories.
2020Ca21 R.Canavan, M.Freer - J.Phys.(London) G47, 095102 (2020).
Demonstration of the universality of molecular structures in prolate deformed nuclei.
2020De03 G.De Gregorio, F.Knapp, N.Lo Iudice, P.Vesely - Phys.Rev. C 101, 024308 (2020).
Proper treatment of the Pauli principle in mirror nuclei within the microscopic particle(hole)-phonon scheme.
2020Fe06 M.Febbraro, R.J.deBoer, S.D.Pain, R.Toomey, F.D.Becchetti, A.Boeltzig, Y.Chen, K.A.Chipps, M.Couder, K.L.Jones, E.Lamere, Q.Liu, S.Lyons, K.T.Macon, L.Morales, W.A.Peters, D.Robertson, B.C.Rasco, K.Smith, C.Seymour, G.Seymour, M.S.Smith, E.Stech, B.Vande Kolk, M.Wiescher - Phys.Rev.Lett. 125, 062501 (2020).
New $^{13}C(\alpha,n)^{16}O$ Cross Section with Implications for Neutrino Mixing and Geoneutrino Measurements.
2020Fo04 J.M.R.Fox, C.W.Johnson, R.N.Perez - Phys.Rev. C 101, 054308 (2020).
Uncertainty quantification of an empirical shell-model interaction using principal component analysis.
2020He19 M.He, S.-S.Zhang, M.Kusakabe, S.Xu, T.Kajino - Astrophys.J. 899, 133 (2020).
Nuclear Structures of ^{17}O and Time-dependent Sensitivity of the Weak s-process to the $^{16}O(n,\gamma)^{17}O$ Rate.
2020Ma25 A.Magilligan, B.A.Brown - Phys.Rev. C 101, 064312 (2020).
New isospin-breaking "USD" Hamiltonians for the sd shell.
2020Me09 A.Meyer, N.de Sereville, A.M.Laird, F.Hammache, R.Longland, T.Lawson,M.Pignatari, L.Audouin, D.Beaumel, S.Fortier, J.Kiener, A.Lefebvre-Schuhl, M.G.Pellegriti, M.Stanoiu, V.Tatischeff - Phys.Rev. C 102, 035803 (2020).
Evaluation of the $^{13}N(\alpha, p)^{16}O$ thermonuclear reaction rate andits impact on the isotopic composition of supernova grains.
2020Mi15 T.Miyagi, S.R.Stroberg, J.D.Holt, N.Shimizu - Phys.Rev. C 102, 034320 (2020).
Ab initio multishell valence-space Hamiltonians and the island of inversion.
2020Na31 D.K.Nauruzbayev, A.K.Nurmukhanbetova, V.Z.Goldberg, M.La Cognata, A.Di Pietro, P.Figuera, S.Cherubini, M.Gulino, L.Lamia, R.G.Pizzone, R.Sparta, A.Tumino, A.Serikov, E.M.Gazeeva - Phys.Atomic Nuclei 83, 520 (2020).
Strong Resonances at High Excitation Energy in ^{17}O + Alpha Resonance Scattering.
2020Na34 Y.Nagai, M.Kinoshita, M.Igashira, Y.Nobuhara, H.Makii, K.Mishima, T.Shima, A.Mengoni - Phys.Rev. C 102, 044616 (2020).
Nonresonant p-wave direct capture and interference effect observed inthe ^{16}O (n, γ) ^{17}O reaction.

REFERENCES FOR A=17(CONTINUED)

2020So01 V.Soma, P.Navratil, F.Raimondi, C.Barbieri, T.Duguet - Phys.Rev. C 101, 014318 (2020).
Novel chiral Hamiltonian and observables in light and medium-mass nuclei.

2020StZV N.Stone - INDC(NDS)−0816 (2020).
Table of Recommended Nuclear Magnetic Dipole Moments: Part II, Short-Lived States.

2020Vi06 A.Vinayak, M.M.Hosamani, P.N.Patil, N.M.Badiger - Int.J.Mod.Phys. E29, 2050030 (2020).
Determination of single neutron spectroscopic factor of doubly shell closed, neutron shell closed and neutron-rich nuclei through (d,p) reaction.

2020Zi03 S.Ziliani - Nuovo Cim. C 43, 107 (2020).
Lifetime measurement in the femtoseconds range in neutron-rich light nuclei with the AGATA tracking array.

2021Ci02 M.Ciemala, S.Ziliani, F.C.L.Crespi, S.Leoni, B.Fornal, A.Maj, P.Bednarczyk, G.Benzoni, A.Bracco, C.Boiano, S.Bottoni, S.Brambilla, M.Bast, M.Beckers, T.Braunroth, F.Camera, N.Cieplicka-Orynczak, E.Clement, S.Coelli, O.Dorvaux, S.Erturk, G.De France, C.Fransen, A.Goldkuhle, J.Grebosz, M.N.Harakeh, L.W.Iskra, B.Jacquot, A.Karpov, M.Kicinska-Habior, Y.-H.Kim, M.Kmiecik, A.Lemasson, S.M.Lenzi, M.Lewitowicz, H.Li, I.Matea, K.Mazurek, C.Michelagnoli, M.Matejska-Minda, B.Million, C.Muller-Gatermann, V.Nanal, P.Napiorkowski, D.R.Napoli, R.Palit, M.Rejmund, Ch.Schmitt, M.Stanoiu, I.Stefan, E.Vardaci, B.Wasilewska, O.Wieland, M.Zieblinski, M.Zielinska - Eur.Phys.J. A 57, 156 (2021).
Accessing tens-to-hundreds femtoseconds nuclear state lifetimes with low-energy binary heavy-ion reactions.

2021He03 B.Hernandez, P.Sarriguren, O.Moreno, E.Moya de Guerra, D.N.Kadrev, A.N.Antonov - Phys.Rev. C 103, 014303 (2021).
Nuclear shape transitions and elastic magnetic electron scattering.

2021Hu06 W.J.Huang, M.Wang, F.G.Kondev, G.Audi, S.Naimi - Chin.Phys.C 45, 030002 (2021).
The AME 2020 atomic mass evaluation (I). Evaluation of input data, and adjustment procedures.

2021Wa16 M.Wang, W.J.Huang, F.G.Kondev, G.Audi, S.Naimi - Chin.Phys.C 45, 030003 (2021).
The AME 2020 atomic mass evaluation (II). Tables, graphs and references.

2021Zh26 S.Zhang, S.Xu, M.He, M.S.Smith - Eur.Phys.J. A 57, 114 (2021).
Neutron capture on ^{16}O within the framework of RMF + ACCC + BCS for astrophysical simulations.