Table 16.19 from (1977AJ02): Levels of ^{16}O from ^{15}N(p, γ)^{16}O, ^{15}N(p, p)^{15}N and ^{15}N(p, α)^{12}C

E_p (keV)	Γ_{γ_0} [a] (eV)	Γ_{γ_1} [a] (eV)	Γ_p [a] (keV)	Γ_{α_0} [a] (keV)	Γ_{α_1} [a] (keV)	Γ_{lab} (keV)	$J^\pi; T$	E_x (MeV $\pm$ keV)	Refs. [b]
338	12 ± 2	0.12 ± 0.04	1.2	95 [c]	0.025	96	$1^-; 0$	12.444	(1974RO37, 1973BR19)
429 ± 1	$(21 \pm 6) \times 10^{-3}$	2.1 ± 0.2 [p]	0.020	nr	0.90	0.9	$2^-; 0$	12.530	(1974RO37)
710 ± 7			40	nr		40 ± 4	$0^-; 1$	12.793	
897.37 ± 0.29	$(78 \pm 16) \times 10^{-3}$		1.2	nr	0.69 ± 0.07	2.0 ± 0.2	$2^-; 1$	12.9686	(1974RO37)
1028 ± 10	32 ± 5		100	40	r	140 ± 10	$1^-; 1$	13.091	(1974RO37, 1973BR19)
1050 ± 150				$\Gamma_p\Gamma_{\alpha_0} = 500$ keV^2			2^+	13.1	
1210 ± 3			4.1	r	8.2 ± 1.1	22.5 ± 1	$3^-; 1$	13.261	(1974RO37)
1640 ± 3	≈ 8.5		10	nr	59 ± 6	68 ± 3	$1^+; 0$	13.664	(1974RO37)
1890 ± 20				r	(r)	90 ± 20		13.90	
1979 ± 3			0.5	nr	r	23 ± 2	2^-	13.982	
3000 ± 30			r	r	r	45 ± 10	4^+	14.94	
3300 ± 35			r	nr	r	75 ± 15	2^-	15.22	
3350 ± 50	≈ 0.6		≈ 125	r	r	750 ± 100	2^+; (0)	15.27	
3520 ± 40			r	r	r	100 ± 25	$(1 \rightarrow 4)$	15.43	
(4280 ± 20)		r [d]						(16.14)	
4380 ± 20	4.5		16 [e]			31	$1^{(+)}; 1$	16.23	
5200	r					≈ 1500	$1^-; 1$	17.0	
5350 ± 20	16		26 [e]			≈ 65	$1^-; 1$	17.14	
5490 ± 20	67		45 [e]			≈ 110	$1^-; 1$	17.27	
6290 ± 20	nr	5 ± 2 [f]	(r)			< 40	3	18.02	(1970BA33, 1974CH37) [p]
7310 ± 20		1 or 2 [f]				< 40	2, 4	18.97	(1974CH37) [p]
7330 ± 30	38					260		18.99	(1970BA33) [p]
7420	r		≈ 30			≈ 130	2^+; (1)	19.08	
7600 ± 30	nr	1.5 [d]				100	(2, 3; 1)	19.25	(1970BA33)
7840 ± 30	59		(r)			350	$1^-; 1$	19.47	(1970BA33)
8290 ± 20	nr	13 or 26 [f]				80 ± 30	3	19.89	(1970BA33, 1971BA04, 1974CH37) [p]
8860 ± 20 [g]	nr	137 ± 50				200	$(2^-); 1$	20.43 [h]	(1970BA33, 1971BA04, 1974CH37) [p]
8990 [i]			[j]			160		20.55	(1971DR06)
9410 [i]	170		[k]			320 ± 10 [l]	$1^-; 1$	20.945 ± 20	(1970BA33,

Table 16.19 from (1977AJ02): Levels of ^{16}O from ^{15}N(p, γ)^{16}O, ^{15}N(p, p)^{15}N and ^{15}N(p, α)^{12}C (continued)

E_p (keV)	Γ_{γ_0} [a] (eV)	Γ_{γ_1} [a] (eV)	Γ_p [a] (keV)	Γ_{α_0} [a] (keV)	Γ_{α_1} [a] (keV)	Γ_{lab} (keV)	$J^\pi; T$	E_x (MeV $\pm$ keV)	Refs. [b]
									1971DR06, 1973OC1B)
10000 [i]			[m]			130	$4 \geq J \geq 1$	21.50	(1971DR06)
10180 [i]			[n]	r		< 45	$T = 0$	21.66	(1971DR06)
10700 [i]	r		[m]			725 ± 10 [l]	$1^-; 1$	22.146 ± 20	(1970BA33, 1971DR06, 1973OC1B)
11490 [i]	120	27 [d]	[m]			320 ± 15 [l]	$1^-; 1$	22.888 ± 30	(1970BA33, 1971DR06, 1973OC1B)
12740 [i]	r					590 ± 40 [l]	$1^-; 1$	24.065 ± 35	(1973OC1B)
13490 ± 60		260 ± 100 or 140 ± 50 [f]				360 ± 60	$(2^+, 4^+); 1$	24.77 [o]	(1974CH37) [p]
13870 [i]	r					3150 ± 320 [l]	$1^-; 1$	25.12 ± 65	(1973OC1B)
15250 ± 80		450 ± 160 [f]				565 ± 90	$(2^+); 1$	26.42 [o]	(1974CH37) [p]
16250 ± 100		1190 ± 430 or 660 ± 240 [f]				880 ± 120	$(2^+, 4^+); 1$	27.36	(1974CH37) [p]

[a] nr = non-resonant; r = resonant.

[b] For earlier references see Table 16.21 in (1971AJ02).

[c] $\Gamma_{\alpha_0}\Gamma_{\gamma_0}/\Gamma = (0.97 \pm 0.18) \times 10^{-4}$ (1973BR19).

[d] $\gamma_1 + \gamma_2$.

[e] $\Gamma_n = 6$, 19 and 45 keV, respectively, for ^{16}O*(16.23, 17.14, 17.27) (1964TA06).

[f] Decay is via ^{16}O*(6.13) [Γ_{γ_2}] (1970BA33, 1971BA04, 1974CH37).

[g] This state is attributed to the giant M2 resonance (1974CH37).

[h] (1971DR06) suggest two states at $E_x = 20.37$ and 20.42 MeV [$\Gamma_{c.m.} = 120$ and 180 keV; $J^\pi \geq 1$ and $(2, 3, 4)^+$, respectively]. The first corresponds to a structure in the p_1 yeild, the second to structures in the n, p_0 and (p_2) yields.

[i] Nominal E_p, calculated from E_x.

[j] Resonant in n, p_2 (1971DR06).

[k] Resonant in p_2 (1971DR06).

[l] $(\Gamma_{p:l=0} + \Gamma_{p:l=2})\Gamma_\gamma\Gamma = 21.0 \pm 1.0$, 488 ± 20, 69 ± 5, 130 ± 13, 650 ± 50 eV for ^{16}O*(20.95, 22.15, 22.89, 24.07, 25.12), respctively (1973OC1B).

[m] Resonant in p_1 (1971DR06).

[n] Resonant in p_0, p_1, p_6 (1971DR06).

[o] These three states are attributed to the configuration $(1p_{1/2}^{-1}1f_{7/2})_{4^+:T=1}$. $J = 2$ and 3 are not excluded (1974CH37).

[p] S.H. Chew and J. Lowe, private comminucation.