

Table 17.19 from (1977AJ02): Resonances in  $^{16}\text{O}(p, p)^{16}\text{O}$  and  $^{16}\text{O}(p, \alpha)^{13}\text{N}$ 

$E_p$ (MeV $\pm$ keV)	$\Gamma_{\text{c.m.}}$ (keV)	Particles out	$\Gamma_{p_0}/\Gamma$	$^{17}\text{F}^*$ (MeV)	$J^\pi; T$	Refs.
$2.663 \pm 7$	$19 \pm 1$	$p_0$		3.106	$\frac{1}{2}^-$	A
3.47	$1.53 \pm 0.2$	$p_0$		3.86	$\frac{5}{2}^-$	A, (1974DA04)
$4.354 \pm 10$	225	$p_0$		4.696	$\frac{3}{2}^-$	A
$4.787 \pm 10$	1530	$p_0$		5.103	$\frac{3}{2}^+$	A
$5.231 \pm 10$	68	$p_0$		5.521	$\frac{3}{2}^-$	A
$5.392 \pm 10$	40	$p_0$		5.672	$\frac{7}{2}^-$	A
$5.402 \pm 10$	$< 0.6$	$p_0$		5.682	$\frac{1}{2}^+$	A
$5.546 \pm 10$	180	$p_0$		5.817	$\frac{3}{2}^+$	A
$5.779 \pm 10$	30	$p_0$		6.036	$\frac{1}{2}^-$	A
$6.332 \pm 10$	200	$p_0$		6.556	$\frac{1}{2}^+$	A
$6.484 \pm 10$	$< 3$	$p_0$		6.699	$\frac{3}{2}^-$	A
$6.564 \pm 10$	4.5	$p_0$		6.774	$\frac{3}{2}^+$	A
$6.833 \pm 10$	3.8	$p_0, \gamma_{6.13}$		7.027	$\frac{5}{2}^-$	A, (1974DA04)
$7.183 \pm 10$	$10 \pm 2$	$p_0, p_2, \alpha_0$		7.356	$\frac{3}{2}^+$	A
$7.280 \pm 7$	$\leq 5$	$p_0$		7.448		A
$7.287 \pm 7$	$7 \pm 2$	$p_0, p_1, p_2, \alpha$		7.454		A
$7.305 \pm 7$	$5 \pm 2$	$p_0, p_2$		7.471		A
$7.313 \pm 10$	795	$p_0$		7.479	$\frac{3}{2}^+$	A
$7.385 \pm 10$	30	$p_0, p_2, \gamma_{6.13}$		7.546	$\frac{7}{2}^-$	A
$7.60 \pm 20$	$179 \pm 3$	$p_0, p_1, \alpha_0$		7.75	$\frac{1}{2}^+$	A
$7.81 \pm 15$	$10 \pm 3$	$p_2$		7.95		A
$7.88 \pm 20$	$50 \pm 20$	$p_0, \gamma_{6.13}, \gamma_{6.92}, \alpha_0$		8.01		A

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$E_p$ (MeV $\pm$ keV)	$\Gamma_{\text{c.m.}}$ (keV)	Particles out	$\Gamma_{p_0}/\Gamma$	$^{17}\text{F}^*$ (MeV)	$J^\pi; T$	Refs.
$7.94 \pm 15$	$100 \pm 20$	$p_0, p_1, \alpha_0$		8.07	$\frac{5}{2}^+$	A
8.1	$700 \pm 250$	$(p_0), p_1, \alpha_0$		8.2	$\frac{3}{2}^-$	A
$8.275 \pm 5$	$11 \pm 5$	$p_0 \rightarrow p_3, \alpha_0$		8.383	$\frac{5}{2}^-$	A
$8.310 \pm 10$	$45 \pm 10$	$p_0 \rightarrow p_3, \gamma_{6.13}, \gamma_{6.92}, \alpha_0$		8.416	$\frac{7}{2}^+$	A
$8.66 \pm 30$	$170 \pm 30$	$p_2, p_3, p_4, \alpha_0$		8.75	$\frac{5}{2}^+$	A
8.68	$90 \pm 20$	$p_0$	0.2	8.76	$\frac{3}{2}^+$	(1971PR05)
8.90	$165 \pm 30$	$p_0 \rightarrow p_4, \gamma_{6.13}, \gamma_{6.92}, \alpha_0$	0.3	8.97	$\frac{7}{2}^-$	A, (1971PR05)
9.22	$140 \pm 30$	$p_0 \rightarrow p_4, \gamma_{6.13}, \gamma_{6.92}, \alpha_0$	$0.5 - 0.6$	9.27	$\frac{3}{2}^-$	A, (1971PR05)
$(9.59 \pm 20)$	$310 \pm 70$	$p_0, p_1, p_4$		$(9.62)$		(1964DA02)
9.90	$90 \pm 30$	$p_0, p_2, \alpha_0$	0.05	9.91	$\frac{9}{2}^+$	A, (1971PR05)
$10.04 \pm 20$	$280 \pm 100$	$p_0, p_1$		10.04	$\frac{7}{2}$	A
$10.23 \pm 20$	$250 \pm 80$	$\alpha_0$		10.22		(1964DA02)
$10.42 \pm 20$	$160 \pm 40$	$p_0, p_1, p_3$		10.40	$(\frac{5}{2}^+)$	(1964DA02, 1975HI02)
$10.525 \pm 15$	$165 \pm 25$	$p_0, p_2, \alpha_0$	$0.28 \pm 0.03$	10.499	$\frac{7}{2}^-$	A, (1971PR05, 1975HI02)
$(10.75 \pm 50)$		$p_0, p_1, \alpha_0$		$(10.71)$	$(\frac{7}{2}^-)$	(1964DA02, 1975HI02)
$10.83 \pm 20$	$120 \pm 40$	$p_0, p_2, (p_3), (\alpha_0)$		10.79		A
$10.96 \pm 100$	$560 \pm 100$	$p_0$	$0.25 \pm 0.07$	10.91	$\frac{1}{2}^-$	(1975HI02)
$11.00 \pm 20$	$190 \pm 50$	$(p_2), p_3, (\alpha_0)$		10.95		A
$11.2636 \pm 2.0^a$	$0.20 \pm 0.04$	$p_0, p_2, p_4, \alpha_0$		$11.1931 \pm 2.3$	$\frac{1}{2}^-; \frac{3}{2}$	A, (1974SK02, 1976HI09)
$11.52 \pm 20$	$240 \pm 50$	$p_2, \alpha_0$		11.43		A
$11.67 \pm 40$	$160 \pm 30$	$p_0, p_3$		11.58		A
$12.12 \pm 20$	$120 \pm 40$	$p_2, \alpha_0$		12.00		A

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$E_p$ (MeV $\pm$ keV)	$\Gamma_{\text{c.m.}}$ (keV)	Particles out	$\Gamma_{p_0}/\Gamma$	$^{17}\text{F}^*$ (MeV)	$J^\pi; T$	Refs.
12.39 $\pm$ 20	300 $\pm$ 30	$p_0, p_2$	0.26 $\pm$ 0.03	12.25	$\frac{3}{2}^-$	A, (1971PR05, 1975HI02)
12.500 $\pm$ 10	190 $\pm$ 20	$p_0, p_1, p_4$	0.31 $\pm$ 0.03	12.355	$\frac{1}{2}^-$	A, (1975HI02)
$\approx$ 12.65	$\approx$ 600	$p_0$	$\approx$ 0.09	$\approx$ 12.50	$\frac{7}{2}^-$	(1975HI02)
12.7077 $\pm$ 2.0 <sup>b</sup>	2.83 $\pm$ 0.12	$p_0, p_2, p_4, p_5, \alpha_0, \alpha_1$	0.26 $\pm$ 0.04	12.5507 $\pm$ 2.3	$\frac{3}{2}^-; \frac{3}{2}$	A, (1974SK02, 1976HI09)
(13.06 $\pm$ 100)		$p_0$		(12.88)	$(\frac{7}{2}^-)$	(1975HI02)
(13.06 $\pm$ 50)		$p_0$		(12.88)	$(\frac{1}{2}^+)$	(1975HI02)
13.250 $\pm$ 4	2 $\pm$ 1	$p_0, p_{1+2}, p_{3+4}, p_5, \alpha_0$	0.15 $\pm$ 0.04	13.060	$\frac{5}{2}^-; \frac{3}{2}$	A, (1974SK02)
13.271 $\pm$ 4	2 $\pm$ 1	$p_0 \rightarrow p_4, \alpha_0$	0.04 $\pm$ 0.02	13.080	$(\frac{1}{2}^+); \frac{3}{2}$	A, (1974SK02)
13.32 $\pm$ 100	520 $\pm$ 50	$p_0$	0.163 $\pm$ 0.016	13.13	$\frac{5}{2}^-$	A, (1975HI02)
14.017 $\pm$ 4	12 $\pm$ 5	$p_0, p_{1+2}, p_{3+4}, \alpha_0$	0.02 $\pm$ 0.01	13.781	$\frac{5}{2}^+; \frac{3}{2}$	A, (1974SK02)
(14.20 $\pm$ 50)		$p_0$		(13.95)	$(\frac{1}{2}^+)$	(1975HI02)
14.25 $\pm$ 50	260 $\pm$ 30	$p_0$	0.08 $\pm$ 0.01	14.00	$\frac{7}{2}^-$	(1975HI02)
14.438 $\pm$ 6	27 $\pm$ 5	$p_0, p_{3+4}$	0.04 $\pm$ 0.02	14.177	$\frac{3}{2}^-; \frac{3}{2}$	(1974SK02)
14.5730 $\pm$ 3.0 <sup>c</sup>	19.3 $\pm$ 1.6	$p_0, p_{1+2}, p_{3+4}, p_5, \alpha_0$	0.11 $\pm$ 0.03	14.3040 $\pm$ 3.3	$\frac{7}{2}^-; \frac{3}{2}$	A, (1974SK02, 1976HI09)
14.65 $\pm$ 50	610 $\pm$ 50	$p_0$	0.10 $\pm$ 0.01	14.38	$\frac{5}{2}^-$	(1975HI02)
(14.94 $\pm$ 100)		$p_0$			$(\frac{3}{2}^-)$	(1975HI02)
15.00 $\pm$ 100	470 $\pm$ 100	$p_0$	0.25 $\pm$ 0.03	14.71	$\frac{1}{2}^-$	(1975HI02)
15.110 $\pm$ 20	190 $\pm$ 25	$p_0$	0.150 $\pm$ 0.015	14.809	$\frac{1}{2}^+$	(1975HI02)
(15.245 $\pm$ 100)		$p_0$		(14.94)	$(\frac{5}{2}^+)$	(1975HI02)
(15.30 $\pm$ 50)		$p_0$		(14.98)	$(\frac{3}{2}^+)$	(1975HI02)
(15.37 $\pm$ 100)		$p_0$		(15.05)	$(\frac{3}{2}^-)$	(1975HI02)
(15.545 $\pm$ 100)		$p_0$		(15.22)	$(\frac{7}{2}^-)$	(1975HI02)

Table 17.19 from (1977AJ02): Resonances in  $^{16}\text{O}(p, p)^{16}\text{O}$  and  $^{16}\text{O}(p, \alpha)^{13}\text{N}$  (continued)

$E_p$ (MeV $\pm$ keV)	$\Gamma_{\text{c.m.}}$ (keV)	Particles out	$\Gamma_{p_0}/\Gamma$	$^{17}\text{F}^*$ (MeV)	$J^\pi; T$	Refs.
15.9 <sup>d</sup>	$\approx 550$	$p_0, p_{1+2}$		15.6		A
17.6	1500	$p_0, p_{3+4}$		17.1	$\frac{5}{2}^-$	A, (1971BU05)
20.4	600	$p_0$		19.8	$\frac{3}{2}^+$	A, (1971BU05)
21.6	600	$p_0, (\alpha)$		20.9	$\frac{9}{2}^+$	A, (1971BU05)
22.6	400	$p_0, (\alpha)$		21.8	$(\frac{9}{2}^+)$	(1971BU05)
23.5	600	$p_0, p_5$		22.7	$\frac{7}{2}^+$	A, (1971BU05)
24.7	600	$p_0, (\alpha)$		23.8	$\frac{7}{2}^+$	(1971BU05)
26.4	1500	$p_0, (\alpha)$		25.4	$\frac{7}{2}^-$	A, (1971BU05)
28.3	1500	$p_0$		27.2	$\frac{5}{2}^-$	A, (1971BU05)
30.1	2000	$p_0$		28.9	$\frac{5}{2}^+$	(1971BU05)

A: See references listed for this state in [Table 17.20 \(1971AJ02\)](#).

<sup>a</sup>  $\Gamma_{p_0} = 19 \pm 3$  eV (1976HI09).

<sup>b</sup>  $\Gamma_{p_0} = 0.94 \pm 0.06$  keV,  $\Gamma_{\alpha_0} = 62 \pm 16$  eV,  $\Gamma_{\alpha_1} = 53 \pm 22$  eV (1976HI09); J. Lowe, private communication.

<sup>c</sup>  $\Gamma_{p_0} = 1.65 \pm 0.12$  keV,  $\Gamma_{\alpha_0} = 2.6 \pm 0.7$  keV (1976HI09).

<sup>d</sup> See also [Table 17.20 of \(1971AJ02\)](#), for possible other resonances.