

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	Γ_{p_0}/Γ	$^{17}\text{F}^*$ (MeV)	$J^\pi; T$	Refs.
2.663 ± 7	19 ± 1	p_0		3.106	$\frac{1}{2}^-$	A
3.47	1.53 ± 0.2	p_0		3.86	$\frac{5}{2}^-$	A, (1974DA04)
4.354 ± 10	225	p_0		4.696	$\frac{3}{2}^-$	A
4.787 ± 10	1530	p_0		5.103	$\frac{3}{2}^+$	A
5.231 ± 10	68	p_0		5.521	$\frac{3}{2}^-$	A
5.392 ± 10	40	p_0		5.672	$\frac{7}{2}^-$	A
5.402 ± 10	< 0.6	p_0		5.682	$\frac{1}{2}^+$	A
5.546 ± 10	180	p_0		5.817	$\frac{3}{2}^+$	A
5.779 ± 10	30	p_0		6.036	$\frac{1}{2}^-$	A
6.332 ± 10	200	p_0		6.556	$\frac{1}{2}^+$	A
6.484 ± 10	< 3	p_0		6.699	$\frac{3}{2}^-$	A
6.564 ± 10	4.5	p_0		6.774	$\frac{3}{2}^+$	A
6.833 ± 10	3.8	$p_0, \gamma_{6.13}$		7.027	$\frac{5}{2}^-$	A, (1974DA04)
7.183 ± 10	10 ± 2	p_0, p_2, α_0		7.356	$\frac{3}{2}^+$	A
7.280 ± 7	≤ 5	p_0		7.448		A
7.287 ± 7	7 ± 2	p_0, p_1, p_2, α		7.454		A
7.305 ± 7	5 ± 2	p_0, p_2		7.471		A
7.313 ± 10	795	p_0		7.479	$\frac{3}{2}^+$	A
7.385 ± 10	30	$p_0, p_2, \gamma_{6.13}$		7.546	$\frac{7}{2}^-$	A
7.60 ± 20	179 ± 3	p_0, p_1, α_0		7.75	$\frac{1}{2}^+$	A
7.81 ± 15	10 ± 3	p_2		7.95		A
7.88 ± 20	50 ± 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	Γ_{p_0}/Γ	$^{17}\text{F}^*$ (MeV)	$J^\pi; T$	Refs.
7.94 ± 15	100 ± 20	p_0, p_1, α_0		8.07	$\frac{5}{2}^+$	A
8.1	700 ± 250	$(p_0), p_1, \alpha_0$		8.2	$\frac{3}{2}^-$	A
8.275 ± 5	11 ± 5	$p_0 \rightarrow p_3, \alpha_0$		8.383	$\frac{5}{2}^-$	A
8.310 ± 10	45 ± 10	$p_0 \rightarrow p_3, \gamma_{6.13}, \gamma_{6.92}, \alpha_0$		8.416	$\frac{7}{2}^+$	A
8.66 ± 30	170 ± 30	p_2, p_3, p_4, α_0		8.75	$\frac{5}{2}^+$	A
8.68	90 ± 20	p_0	0.2	8.76	$\frac{3}{2}^+$	(1971PR05)
8.90	165 ± 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 ± 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 ± 20)	310 ± 70	p_0, p_1, p_4		(9.62)		(1964DA02)
9.90	90 ± 30	p_0, p_2, α_0	0.05	9.91	$\frac{9}{2}^+$	A, (1971PR05)
10.04 ± 20	280 ± 100	p_0, p_1		10.04	$\frac{7}{2}$	A
10.23 ± 20	250 ± 80	α_0		10.22		(1964DA02)
10.42 ± 20	160 ± 40	p_0, p_1, p_3		10.40	$(\frac{5}{2}^+)$	(1964DA02, 1975HI02)
10.525 ± 15	165 ± 25	p_0, p_2, α_0	0.28 ± 0.03	10.499	$\frac{7}{2}^-$	A, (1971PR05, 1975HI02)
(10.75 ± 50)		p_0, p_1, α_0		(10.71)	$(\frac{7}{2}^-)$	(1964DA02, 1975HI02)
10.83 ± 20	120 ± 40	$p_0, p_2, (p_3), (\alpha_0)$		10.79		A
10.96 ± 100	560 ± 100	p_0	0.25 ± 0.07	10.91	$\frac{1}{2}^-$	(1975HI02)
11.00 ± 20	190 ± 50	$(p_2), p_3, (\alpha_0)$		10.95		A
11.2636 ± 2.0^a	0.20 ± 0.04	p_0, p_2, p_4, α_0		11.1931 ± 2.3	$\frac{1}{2}^-; \frac{3}{2}$	A, (1974SK02, 1976HI09)
11.52 ± 20	240 ± 50	p_2, α_0		11.43		A
11.67 ± 40	160 ± 30	p_0, p_3		11.58		A
12.12 ± 20	120 ± 40	p_2, α_0		12.00		A

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E_p (MeV \pm keV)	$\Gamma_{\text{c.m.}}$ (keV)	Particles out	Γ_{p_0}/Γ	$^{17}\text{F}^*$ (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 ^b	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 ^c	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	Γ_{p_0}/Γ	$^{17}\text{F}^*$ (MeV)	$J^\pi; T$	Refs.
15.9 ^d	≈ 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 \(1971AJ02\)](#).

^a $\Gamma_{p_0} = 19 \pm 3$ eV (1976HI09).

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

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

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