

Table 17.19 from (1986AJ04): Resonances in $^{16}\text{O}(p, p)^{16}\text{O}$ and $^{16}\text{O}(p, \alpha)^{13}\text{N}$ ^a

E_p (MeV \pm keV)	$\Gamma_{\text{c.m.}}$ (keV)	Particles out	Γ_{p_0}/Γ	$^{17}\text{F}^*$ (MeV)	$J^\pi; T$
2.663 \pm 7	19 \pm 1	p ₀		3.105	$\frac{1}{2}^-$
3.47	1.53 \pm 0.2	p ₀		3.86	$\frac{5}{2}^-$
4.304 \pm 20 ^b	225	p ₀		4.649	$\frac{3}{2}^-$
4.672 \pm 20 ^b	1530	p ₀		4.995	$\frac{3}{2}^+$
5.231 \pm 20	68	p ₀		5.521	$\frac{3}{2}^-$
5.392 \pm 20	40	p ₀		5.672	$\frac{7}{2}^-$
5.402 \pm 20	< 0.6	p ₀		5.682	$\frac{1}{2}^+$
5.546 \pm 20	180	p ₀		5.817	$\frac{3}{2}^+$
5.779 \pm 20	30	p ₀		6.036	$\frac{1}{2}^-$
6.332 \pm 20	200	p ₀		6.556	$\frac{1}{2}^+$
6.482 \pm 7 ^c	$\leq 1.6 \pm 0.2$	p ₀	$\geq 0.25 \pm 0.04$	6.697	$\frac{3}{2}^+$
6.564 \pm 20	4.5	p ₀		6.774	$\frac{3}{2}^+$
6.833 \pm 20	3.8	p ₀ , $\gamma_{6.13}$		7.027	$\frac{1}{2}^-$
7.183 \pm 20	10 \pm 2	p ₀ , p ₂ , α_0		7.356	$\frac{1}{2}^+$
7.280 \pm 20	≤ 5	p ₀		7.448	
7.287 \pm 20	7 \pm 2	p ₀ , p ₁ , p ₂ , α		7.454	
7.305 \pm 20	5 \pm 2	p ₀ , p ₂		7.471	
7.313 \pm 20	795	p ₀		7.479	$\frac{3}{2}^+$
7.385 \pm 20	30	p ₀ , p ₂ , $\gamma_{6.13}$		7.546	$\frac{7}{2}^-$
7.60 \pm 40	179 \pm 30	p ₀ , p ₁ , α_0		7.75	$\frac{1}{2}^+$
7.81 \pm 30	10 \pm 3	p ₂		7.95	
7.88 \pm 40	50 \pm 20	p ₀ , $\gamma_{6.13}$, $\gamma_{6.92}$, α_0		8.01	
7.94 \pm 30	100 \pm 20	p ₀ , p ₁ , α_0		8.07	$\frac{1}{2}^+$ (+)
8.1	700 \pm 250	(p ₀), p ₁ , α_0		8.2	$\frac{1}{2}^+$ (-)
8.275 \pm 10	11 \pm 5	p ₀ \rightarrow p ₃ , α_0		8.383	$\frac{1}{2}^+$ (-)
8.310 \pm 20	45 \pm 10	p ₀ \rightarrow p ₃ , $\gamma_{6.13}$, $\gamma_{6.92}$, α_0		8.416	$\frac{1}{2}^+$ (+)
8.66 \pm 60	170 \pm 30	p ₂ , p ₃ , p ₄ , α_0		8.75	$\frac{1}{2}^+$ (+)
8.68	90 \pm 20	p ₀	0.2	8.76	$\frac{3}{2}^+$
8.91	165 \pm 30	p ₀ \rightarrow p ₄ , $\gamma_{6.13}$, $\gamma_{6.92}$, α_0	0.34 \pm 0.05	8.98 \pm 0.02	$\frac{7}{2}^-$
9.11	140 \pm 30	p ₀ \rightarrow p ₄ , $\gamma_{6.13}$, $\gamma_{6.92}$, α_0	0.55 \pm 0.05	9.17 \pm 0.06	$\frac{3}{2}^+$ (+)
9.91	90 \pm 30	p ₀ , p ₂ , α_0	0.095 \pm 0.005	9.92	$\frac{1}{2}^+$
10.04 \pm 40	280 \pm 100	p ₀ , p ₁		10.04	$\frac{7}{2}^-$
10.23 \pm 40	250 \pm 80	α_0		10.22	$\frac{1}{2}^-$

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E_p (MeV \pm keV)	$\Gamma_{\text{c.m.}}$ (keV)	Particles out	Γ_{p_0}/Γ	$^{17}\text{F}^*$ (MeV)	$J^\pi; T$
10.42 \pm 40	160 \pm 40	p ₀ , p ₁ , p ₃		10.40	$(\frac{5}{2}^+)$
10.525 \pm 30	165 \pm 25	p ₀ , p ₂ , α_0	0.28 \pm 0.03	10.499	$\frac{7}{2}^-$
(10.75 \pm 50)		p ₀ , p ₁ , α_0		(10.71)	$(\frac{7}{2}^-)$
10.83 \pm 40	120 \pm 40	p ₀ , p ₂ , (p ₃), (α_0)		10.79	
10.96 \pm 100	560 \pm 100	p ₀	0.25 \pm 0.07	10.91	$\frac{1}{2}^-$
11.00 \pm 40	190 \pm 50	(p ₂), p ₃ , (α_0)		10.95	
11.2636 \pm 2.0 ^d	0.20 \pm 0.04	p ₀ , p ₂ , p ₄ , α_0	0.093 \pm 0.013	11.1929 \pm 2.1	$\frac{1}{2}^-; \frac{3}{2}$
11.52 \pm 40	240 \pm 50	p ₂ , α_0		11.43	
11.67 \pm 50	160 \pm 30	p ₀ , p ₃		11.58	
12.12 \pm 40	120 \pm 40	p ₂ , α_0		12.00	
12.39 \pm 40	300 \pm 30	p ₀ , p ₂	0.26 \pm 0.03	12.25	$\frac{3}{2}^-$
12.500 \pm 20	190 \pm 20	p ₀ , p ₁ , p ₄	0.31 \pm 0.03	12.355	$\frac{1}{2}^-$
\approx 12.65	\approx 600	p ₀	\approx 0.09	\approx 12.50	$\frac{7}{2}^-$
12.7077 \pm 2.0 ^e	2.83 \pm 0.12	p ₀ , p ₂ , p ₄ , p ₅ , α_0 , α_1	0.332 \pm 0.018	12.5505 \pm 2.3	$\frac{3}{2}^-; \frac{3}{2}$
(13.06 \pm 100)		p ₀		(12.88)	$(\frac{7}{2}^-)$
(13.06 \pm 50)		p ₀		(12.88)	$(\frac{1}{2}^+)$
13.250 \pm 4	2 \pm 1	p ₀ , p ₁₊₂ , p ₃₊₄ , p ₅ , α_0	0.15 \pm 0.04	13.060	$\frac{5}{2}^-; \frac{3}{2}$
13.271 \pm 4	2 \pm 1	p ₀ \rightarrow p ₄ , α_0	0.04 \pm 0.02	13.080	$(\frac{1}{2}^+); \frac{3}{2}$
13.32 \pm 100	520 \pm 50	p ₀	0.163 \pm 0.016	13.13	$\frac{5}{2}^-$
14.017 \pm 4	12 \pm 5	p ₀ , p ₁₊₂ , p ₃₊₄ , α_0	0.02 \pm 0.01	13.781	$\frac{5}{2}^+; \frac{3}{2}$
(14.20 \pm 50)		p ₀		(13.95)	$(\frac{1}{2}^+)$
14.25 \pm 50	260 \pm 30	p ₀	0.08 \pm 0.01	14.00	$\frac{7}{2}^-$
14.438 \pm 6	27 \pm 5	p ₀ , p ₃₊₄	0.04 \pm 0.02	14.177	$\frac{3}{2}^-; \frac{3}{2}$
14.5730 \pm 3.0 ^f	19.3 \pm 1.6	p ₀ , p ₁₊₂ , p ₃₊₄ , p ₅ , α_0	0.085 \pm 0.008	14.3038 \pm 3.1	$\frac{7}{2}^-; \frac{3}{2}$
14.65 \pm 50	610 \pm 50	p ₀	0.10 \pm 0.01	14.38	$\frac{5}{2}^-$
(14.94 \pm 100)		p ₀			$(\frac{3}{2}^-)$
15.00 \pm 100	470 \pm 100	p ₀	0.25 \pm 0.03	14.71	$\frac{1}{2}^-$
15.110 \pm 20	190 \pm 25	p ₀	0.150 \pm 0.015	14.809	$\frac{1}{2}^+$
(15.245 \pm 100)		p ₀		(14.94)	$(\frac{5}{2}^+)$
(15.30 \pm 50)		p ₀		(14.98)	$(\frac{3}{2}^+)$
(15.37 \pm 100)		p ₀		(15.05)	$(\frac{3}{2}^-)$
(15.545 \pm 100)		p ₀		(15.22)	$(\frac{7}{2}^-)$
15.9 ^g	\approx 550	p ₀ , p ₁₊₂		15.6	

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E_p (MeV \pm keV)	$\Gamma_{\text{c.m.}}$ (keV)	Particles out	Γ_{p_0}/Γ	$^{17}\text{F}^*$ (MeV)	$J^\pi; T$
17.6	1500	p_0, p_{3+4}		17.1	$\frac{5}{2}^-$
20.4	600	p_0		19.8	$\frac{3}{2}^+$
21.6	600	$p_0, (\alpha)$		20.9	$\frac{9}{2}^+$
22.6	400	$p_0, (\alpha)$		21.8	$(\frac{9}{2}^+)$
23.5	600	p_0, p_5		22.7	$\frac{7}{2}^+$
24.7	600	$p_0, (\alpha)$		23.8	$\frac{7}{2}^+$
26.4	1500	$p_0, (\alpha)$		25.4	$\frac{7}{2}^-$
28.3	1500	p_0		27.2	$\frac{5}{2}^-$
30.1	2000	p_0		28.9	$\frac{5}{2}^+$

^a See earlier references and comments in Tables 17.20 (1971AJ02), 17.19 (1977AJ02) and 17.21 (1982AJ01). See also Table 17.18 here. Uncertainties in E_p (below 12.7 MeV) have been increased because of a possible error in calibrating the magnet used in many of the measurements reported in (1971AJ02). See also (1964DA02). [Reviewer's comment: these measurements should be repeated.] I am grateful to Drs. H.T. Richards and E.K. Warburton for their many comments.

^b E_r , not E_λ , is used for calculating E_x .

^c (1982SE01). Uncertainty in E_p estimated by reviewer. See also (1982AJ01).

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

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

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

^g See also Table 17.20 of (1971AJ02) for possible other resonances.