

Table 17.6 from (1971AJ02): Resonances in $^{13}\text{C}(\alpha, \alpha_0)^{13}\text{C}$, $^{13}\text{C}(\alpha, n)^{16}\text{O}$ and $^{16}\text{O}(n, \alpha)^{13}\text{C}$

E_α (MeV \pm keV)	E_n (MeV)	Γ_α/Γ	$\Gamma_{c.m.}$ (keV)	J^π	E_x^a (MeV)	Refs.
1.063 \pm 4			2.7 \pm 1	$\frac{5}{2}^+$	7.170	A
1.340 \pm 4			≤ 2	$\frac{5}{2}^+$	7.382	(A, 1969SC04)
1.585 \pm 7			≤ 4	$\frac{7}{2}^-$	7.569	(1956RU1A, 1957WA1C, 1969SC04)
1.736 \pm 5			22	$\frac{5}{2}^+$	7.684	(1956RU1A, 1957WA1C, 1969SC04)
2.080 \pm 20	4.0	0.03	79 \pm 10	$\frac{1}{2}^-$	7.947	(B, 1965BA32, 1967SE07)
2.250 \pm 20	4.15	0.05	71 \pm 8	$\frac{3}{2}^+$	8.077	(C, 1965BA32, 1967SE07)
2.420 \pm 20	4.25	0.11	71 \pm 5	$\frac{3}{2}^-$	8.207	(C, 1965BA32, 1967SE07)
2.603 \pm 5	4.46	0.44	9 \pm 3	$\frac{1}{2}^+$	8.347	(D, 1965BA32, 1967SE07)
2.675 \pm 5	4.53	0.08	4 \pm 3	$\frac{3}{2}^+$	8.402	(D, 1965BA32, 1967SE07)
2.760 \pm 5	4.59	0.97	7 \pm 3	$\frac{3}{2}^+$	8.467	(D, 1965BA32, 1967SE07)
2.805 \pm 5	4.62	0.26	5 \pm 3	$\frac{3}{2}^-$	8.502	(D, 1965BA32, 1967SE07)
3.08 \pm 15	4.85	0.06	50 \pm 3	$\frac{3}{2}^-$	8.71	(D, 1963DA12, 1965BA32, 1967SE07, 1971BA06)
(3.1)			broad	$\frac{1}{2}^-$	8.7	(1971BA06)
3.305		1.00	6	$\frac{1}{2}^-$	8.884	(1965BA32)
3.33 \pm 15	5.05	0.50	101 \pm 3	$\frac{3}{2}^+$	8.90	(D, 1963DA12, 1965BA32, 1967SE07, 1971BA06)
3.42 \pm 15	5.12	0.04	21 \pm 3	$\frac{1}{2}^-$	8.97	(D, 1963DA12, 1965BA32, 1967SE07, 1971BA06)
3.67 \pm 15	5.32	0.45	4 \pm 3	$\frac{1}{2}^-$	9.16	(1956BO61, 1963DA12, 1967SE07, 1968KE02)
3.69		1.00	3	$\frac{1}{2}^-$	9.18	(1968KE02)
3.72	5.37	0.20	5.5 \pm 1	$\frac{3}{2}^+$	9.20	(1956BO61, 1956SC1C, 1963DA12, 1967SE07, 1968KE02)
4.11	5.68	0.85	15 \pm 1	$\frac{3}{2}^-$	9.50	(1956BO61, 1956SC1C, 1963DA12, 1967SE07, 1968KE02)
(4.3)			broad	$\frac{3}{2}^-$	(9.6)	(1971BA06)
4.40		0.70	16 \pm 1	$\frac{1}{2}^+$	9.72	(1956BO61, 1956SC1C, 1967SE07, 1968KE02, 1971BA06)
	5.92			$\frac{3}{2}^+$		(1963DA12)
4.42		0.90	61	$\frac{3}{2}^+$	9.74	(1968KE02, 1971BA06)
4.58	6.08	0.18	12 \pm 1	$\frac{3}{2}^+$	9.86	(1963DA12, 1967SE07, 1968KE02, 1971BA06)
4.70	6.22	0.78	107	$\frac{3}{2}^+$	9.95	(1963DA12, 1968KE02, 1971BA06)
4.94		0.85	138	$\frac{3}{2}^+$	10.13	(1968KE02)

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E_α (MeV \pm keV)	E_n (MeV)	Γ_α/Γ	$\Gamma_{\text{c.m.}}$ (keV)	J^π	E_x^a (MeV)	Refs.
4.995	6.41	0.15	46	$\frac{7}{2}^-$	10.176	(1963DA12, 1968KE02, 1970RO08, 1971BA06)
5.08	6.59	0.60	122	$\frac{7}{2}^+$	10.24	(1963DA12, 1967SE07, 1968KE02)
5.185				$\frac{5}{2}^+, \frac{7}{2}^-$	10.321	(1968KE02, 1970RO08)
5.317 \pm 10			14 \pm 3		10.422	(1963SP02, 1967SE07, 1968KE02)
5.40			75 \pm 30	$\frac{5}{2}^+, \frac{7}{2}^-$	10.49	(1967SE07, 1968KE02)
5.496 \pm 10	6.81		47 \pm 15	$\frac{7}{2}^-, \frac{9}{2}^+$	10.559	(1963DA12, 1963SP02, 1968KE02, 1970RO08)
5.68		1.00	≤ 25	$(\frac{7}{2}^+)$	10.70	(1968KE02)
5.771 \pm 10	7.04		80 \pm 20	$\frac{1}{2}^+, \frac{7}{2}^-$	10.769	(1963DA12, 1963SP02, 1968KE02, 1970RO08)
5.945 \pm 10	7.20		57 \pm 15	$\frac{5}{2}$	10.902	(1963DA12, 1963SP02, 1968KE02, 1970RO08)
6.107 \pm 10	7.32		45 \pm 10		11.026	(1963DA12, 1963SP02, 1968KE02)
6.367 \pm 10	7.59		100 \pm 30		11.225	(1963DA12, 1963SP02)
	(7.79)				(11.47)	(1963DA12)
6.878 \pm 10	7.90		120 \pm 30		11.615	(1963DA12, 1963SP02)
7.051 \pm 10	(8.06)		40 \pm 25		11.748	(1963DA12, 1963SP02)
7.136 \pm 15	8.22		12 \pm 3		11.813	(1963DA12, 1963SP02)
7.384 \pm 15	8.38				12.002	(1963DA12, 1963SP02)
7.52 \pm 20			150 \pm 50		12.11	(1963SP02)
7.736 \pm 15	8.66		100 \pm 30		12.271	(1963DA12, 1963SP02)
7.88 \pm 20					12.38	(1963SP02)
7.927 \pm 15					12.417	(1963SP02)
8.156 \pm 15			75 \pm 30		12.592	(1963SP02)
8.253 \pm 15			≈ 5		12.666	(1963SP02)
8.44 \pm 25					12.81	(1963SP02)
8.59 \pm 20			$\gtrsim 150$		12.92	(1963SP02)
8.72 \pm 20					13.02	(1963SP02)
8.785 \pm 15			16 \pm 4		13.073	(1963SP02)
9.319 \pm 15			≈ 120		13.481	(1963SP02)

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E_α (MeV \pm keV)	E_n (MeV)	Γ_α/Γ	$\Gamma_{\text{c.m.}}$ (keV)	J^π	E_x^a (MeV)	Refs.
9.483 ± 15			250 ± 100		13.606	(1963SP02)

A: (1953JO1A, 1956RU1A, 1957WA1C).

B: (1955SE1A, 1956BO61, 1956RU1A, 1956SC1C, 1957WA1C).

C: (1955SE1A, 1956BE1D, 1956BO61, 1956RU1A, 1956SC1C, 1957WA1C).

D: (1956BE1D, 1956BO61, 1956SC1C, 1957WA1C).

^a I am indebted to Dr. C.H. Johnson for a discussion of the nature of many of these states.