

Table 20.18 from (1987AJ02): Resonances in $^{16}\text{O}(\alpha, \alpha)^a$

E_α (MeV \pm keV)	$\Gamma_{\text{c.m.}}$ (keV)	Outgoing particles	Γ_{α_0}/Γ	θ^2 (%)	E_x (MeV \pm keV)	J^π
1.3174 ± 2.2	$(2.8 \pm 0.3) \times 10^{-2}{}^b$	α_0			5.7877 ± 2.6	1^-
$2.522 \pm 2.5{}^c$	19.0 ± 0.9	α_0		22	6.751 ± 3	0^+
$3.0382 \pm 2.0{}^{a,c}$	$8.1 \pm 0.3{}^b$	α_0		36	7.164	3^-
$3.082 \pm 3.1{}^c$	$3.4 \pm 0.2{}^c$	α_0		1.1	7.199 ± 3	0^+
$3.372 \pm 3.4{}^c$	$15.1 \pm 0.7{}^c$	α_0		4.7	7.431 ± 3	2^+
3.885 ± 10	2	α_0		0.6	7.841 ± 8	2^+
4.653 ± 5	0.013 ± 0.004	α_0		0.07	8.455 ± 5	5^-
≈ 4.9	> 800	α_0		≈ 70	≈ 8.7	0^+
5.002	2.5	α_0		0.23	8.734	1^-
5.058 ± 3	0.11 ± 0.02	α_0		8.5 ± 1.5	8.779 ± 3	6^+
≈ 5.1	> 800	α_0		≈ 95	≈ 8.8	2^+
5.11	< 1	α_0			8.82	(5^-)
5.152 ± 5	19	α_0		1.1	8.854 ± 5	1^-
5.395 ± 5	3	α_0		3.9	9.049 ± 5	4^+
5.486 ± 5	3.2	α_0		0.49	9.121 ± 5	3^-
5.955 ± 10	24	α_0		1.4	9.496 ± 8	2^+
6.569 ± 10	97	α_0		17	9.987 ± 8	4^+
6.912 ± 5	141	α_0		66	10.262 ± 5	5^-
6.92 ± 10	≤ 0.3	α_0		$\leq 1.3 \times 10^{-3}$	10.27 ± 10	(2^+)
7.092 ± 5	81	α_0		4.8	10.406 ± 5	3^-
7.276 ± 5	16	α_0		1.8	10.553 ± 5	4^+
7.314 ± 10	24	α_0		0.85	10.583 ± 8	2^+
7.580 ± 100	349	α_0		33	10.80 ± 75	4^+

Table 20.18 from (1987AJ02): Resonances in $^{16}\text{O}(\alpha, \alpha)$ ^a (continued)

E_α (MeV \pm keV)	$\Gamma_{\text{c.m.}}$ (keV)	Outgoing particles	Γ_{α_0}/Γ	θ^2 (%)	E_x (MeV \pm keV)	J^π
7.635 \pm 5	13	α_0		0.42	10.840 \pm 5	2 ⁺
7.636	45	α_0		2.1	10.841	3 ⁻
(7.75)	80	α_0			(10.93)	
7.80 \pm 150	576	α_0		14	10.97 \pm 113	0 ⁺
7.860 \pm 10	24	α_0		2.0	11.020 \pm 8	4 ⁺
7.93 \pm 10	≤ 0.5	α_0		≤ 0.05	11.08 \pm 10	(4 ⁺)
8.132 \pm 30	172	α_0		4.2	11.24 \pm 23	1 ⁻
8.16 \pm 10	≤ 0.3	α_0		≤ 0.009	11.26 \pm 10	(1 ⁻)
8.24 \pm 10	40 \pm 10	α_0		1.4	11.32 \pm 10	2 ⁺
8.528 \pm 10	1.0 \pm 0.5	α_0		0.03	11.551 \pm 8	0 ⁺ ⁱ
(≈ 8.6)	≈ 500	α_0			(≈ 11.6)	(2 ⁺)
8.930 \pm 20	46	α_0		1.1	11.875 \pm 15	2 ⁺
8.997 \pm 5	0.44 \pm 0.15	$\alpha_0, \gamma_{6.13}$		0.04 \pm 0.01	11.929 \pm 5	4 ⁺
9.026 \pm 5	(35 \pm 10) $\times 10^{-3}$	α_0		1.0 \pm 0.3	11.952 \pm 5	8 ⁺
9.043 \pm 10	30 \pm 5	α_0		0.72	11.966 \pm 8	1 ⁻
9.25 ^d		$\alpha_0, \gamma_{6.13}$		^e	12.137 \pm 5	6 ⁺
9.403 \pm 9	155 \pm 15	α_0	0.89 \pm 0.05	6.8	12.253 \pm 10	4 ⁺
9.406 \pm 4 ^f	< 1	$\gamma_{6.13}$		^e	12.256 \pm 4	3 ⁻ ; 1
9.495 \pm 13	390 \pm 50	α_0	0.92 \pm 0.04	8	12.327 \pm 10	2 ⁺
9.587 \pm 2	37.3 \pm 0.9	$\alpha_0, \gamma_{6.13}$	1.00 \pm 0.04	1.2	12.401 \pm 5	3 ⁻
9.628 \pm 5	24.4 \pm 0.5	α_0, α_1	0.62 \pm 0.15	0.3	12.433 \pm 5	0 ⁺
9.677 \pm 8	124 \pm 6	α_0	0.88 \pm 0.05	2.4	12.472 \pm 10	(2 ⁺)
9.818 \pm 6	72 \pm 9	α_0	0.68 \pm 0.05	14	12.585 \pm 5	6 ⁺

Table 20.18 from (1987AJ02): Resonances in $^{16}\text{O}(\alpha, \alpha)^a$ (continued)

E_α (MeV \pm keV)	$\Gamma_{\text{c.m.}}$ (keV)	Outgoing particles	Γ_{α_0}/Γ	θ^2 (%)	E_x (MeV \pm keV)	J^π
9.827 \pm 14	145 \pm 25	α_0	0.78 \pm 0.09	2.5	12.592 \pm 15	(2 ⁺)
9.978 \pm 6	84 \pm 8	α_0	1.00 \pm 0.05	7.3	12.713 \pm 5	5 ⁻
10.015 \pm 7	61 \pm 12	α_0	0.72 \pm 0.09	0.9	12.743 \pm 10	(2 ⁺)
10.132 \pm 2	30 \pm 5	$\alpha_0, \gamma_{6.13}$	0.83 \pm 0.09	0.45	12.836 \pm 5	1 ⁻
(10.27)	(580)	(α_0)	(0.92)	(21)	(12.95)	(4 ⁺)
10.283 \pm 2	38 \pm 4	$\alpha_0, \gamma_{6.13}$	1.00 \pm 0.08	0.8	12.957 \pm 5	2 ⁺
10.397 \pm 1	18 \pm 3	$\alpha_0, \gamma_{6.13}$	0.55 \pm 0.05	0.4	13.048 \pm 5	4 ⁺
(10.419 \pm 15)	(305 \pm 55)	(α_0)	(0.42 \pm 0.03)	(3.2)	(13.066 \pm 15)	(3 ⁻ , 5 ⁻)
10.461 \pm 12	53 \pm 24	α_0	0.22 \pm 0.07	0.5	13.099 \pm 10	(0 ⁺)
10.468 \pm 5	102 \pm 5	α_0	0.52 \pm 0.04	11	13.105 \pm 5	6 ⁺
10.508 \pm 2	48 \pm 4	α_0	1.00 \pm 0.05	1.2	13.137 \pm 5	3 ⁻
10.614 \pm 7	40 \pm 13	α_0	0.55 \pm 0.13	0.4	13.222 \pm 10	0 ⁺
10.617 \pm 19	\approx 80	α_0	0.22 \pm 0.07	0.3	13.224 \pm 15	1 ⁻
10.620 \pm 2	53 \pm 4	α_0	1.00 \pm 0.04	1.3	13.226 \pm 5	3 ⁻
10.759 \pm 6 ^f	(8 \pm 3) \times 10 ⁻²	α_0		0.08 \pm 0.03	13.338 \pm 5	7 ⁻
10.763 \pm 1	26 \pm 3	$\alpha_0, \gamma_{6.13}$	0.70 \pm 0.05	0.6	13.341 \pm 5	4 ⁺
10.854 \pm 3	34 \pm 5	$\alpha_0, \gamma_{6.13}$	0.46 \pm 0.05	0.4	13.414 \pm 5	3 ⁻
10.857 \pm 4	\approx 16	α_0	0.16 \pm 0.06	0.06	13.416 \pm 5	(3 ⁻)
10.870 \pm 4	49 \pm 7	α_0	0.38 \pm 0.04		13.426 \pm 5	(5 ⁻)
10.913 \pm 8	195 \pm 25	α_0	0.99 \pm 0.05	3.2	13.461 \pm 10	1 ⁻
10.971 \pm 4	24 \pm 8	α_0	0.36 \pm 0.07	0.15	13.507 \pm 5	1 ⁻
10.999 \pm 4	61 \pm 8	α_0	0.72 \pm 0.05	0.8	13.529 \pm 5	2 ⁺
11.000 \pm 15	76 \pm 32	α_0	0.52 \pm 0.13	0.6	13.530 \pm 15	(0 ⁺)

Table 20.18 from (1987AJ02): Resonances in $^{16}\text{O}(\alpha, \alpha)^a$ (continued)

E_α (MeV \pm keV)	$\Gamma_{\text{c.m.}}$ (keV)	Outgoing particles	Γ_{α_0}/Γ	θ^2 (%)	E_x (MeV \pm keV)	J^π
11.054 \pm 3	12 \pm 5	α_0	0.19 \pm 0.06	0.04	13.573 \pm 5	2 ⁺
11.183 \pm 1	11 \pm 2	α_0	0.33 \pm 0.05	0.2	13.677 \pm 5	5 ⁻
11.202 \pm 12	310 \pm 30	$\alpha_0, \gamma_{6.13}$	0.51 \pm 0.03	84	13.692 \pm 10	7 ⁻
11.267 \pm 26	\approx 80	α_0	0.33 \pm 0.12	0.4	13.744 \pm 20	0 ⁺
11.371 \pm 9	136 \pm 15	α_0	0.73 \pm 0.04	2.1	13.827 \pm 10	3 ⁻
11.420 \pm 34	\approx 175	α_0	0.21 \pm 0.06	0.6	13.866 \pm 30	1 ⁻
11.473 \pm 5	74 \pm 10	α_0	0.75 \pm 0.06	1.0	13.908 \pm 5	2 ⁺
11.498 \pm 5	65 \pm 3	α_0	0.86 \pm 0.04	6.9	13.928 \pm 5	6 ⁺
11.522 \pm 7	79 \pm 15	α_0	1.0 \pm 0.1	1.3	13.948 \pm 10	0 ⁺
11.544 \pm 2	8.1 \pm 1	α_0	0.46 \pm 0.05	0.11	13.965 \pm 5	4 ⁺
(11.607 \pm 19)	(\approx 80)	(α_0)	(0.19 \pm 0.05)	(0.25)	(14.015 \pm 15)	(1 ⁻)
(11.663 \pm 19)	(150 \pm 50)	(α_0)	(0.24 \pm 0.05)	(0.6)	(14.060 \pm 15)	(2 ⁺)
11.732 \pm 4	42 \pm 6	$\alpha_0, \gamma_{6.9+7.1}$	0.71 \pm 0.06	0.5	14.115 \pm 5	2 ⁺
11.925 \pm 7	92 \pm 9	α_0	0.64 \pm 0.04	1.6	14.270 \pm 10	4 ⁺
11.968 \pm 8	60 \pm 13	$\alpha_0, \gamma_{6.13}, \gamma_{6.9+7.1}$	0.31 \pm 0.05	1.9	14.304 \pm 10	(6 ⁺)
11.977 \pm 6	117 \pm 8	α_0	0.82 \pm 0.04	9.6	14.311 \pm 5	6 ⁺
11.979 \pm 15	\approx 45	α_0	0.13 \pm 0.06	0.1	14.313 \pm 15	(3 ⁻)
12.148 \pm 28	\approx 95	α_0	0.18 \pm 0.06 ^e	0.3	14.448 \pm 25	(0 ⁺ , 2 ⁺)
12.156 \pm 4	\approx 15	α_0	0.09 \pm 0.04	0.05	14.454 \pm 5	5 ⁻
12.322 \pm 25	140 \pm 50	α_0	0.45 \pm 0.08	0.9	14.587 \pm 20	1 ⁻
12.329 \pm 13	260 \pm 25	$\alpha_0, \gamma_{6.9+7.1}$	0.79 \pm 0.04	5.3	14.593 \pm 10	4 ⁺
12.447 \pm 11	90 \pm 30	α_0	0.35 \pm 0.06	0.6	14.687 \pm 10	(3 ⁻)
12.502 \pm 10	60 \pm 25	α_0	0.25 \pm 0.06	0.4	14.731 \pm 10	(4 ⁺)

Table 20.18 from (1987AJ02): Resonances in $^{16}\text{O}(\alpha, \alpha)$ ^a (continued)

E_α (MeV \pm keV)	$\Gamma_{\text{c.m.}}$ (keV)	Outgoing particles	Γ_{α_0}/Γ	θ^2 (%)	E_x (MeV \pm keV)	J^π
12.539 \pm 2	7.3 \pm 4.8	α_0	0.18 \pm 0.05	0.1	14.761 \pm 5	6 ⁺
12.597 \pm 4	86 \pm 7	α_0	0.95 \pm 0.04	6.5	14.807 \pm 5	6 ⁺
12.608 \pm 5	117 \pm 13	α_0	0.69 \pm 0.04	3.1	14.816 \pm 5	5 ⁻
12.637 \pm 8	79 \pm 15	α_0	0.45 \pm 0.05	0.9	14.839 \pm 10	(4 ⁻)
12.699 \pm 12	100 \pm 30	α_0	0.44 \pm 0.06	0.7	14.888 \pm 10	2 ⁺
12.897 \pm 10	66 \pm 20	α_0	0.31 \pm 0.06	0.3	15.047 \pm 10	2 ⁺
12.930 \pm 12	160 \pm 25	α_0	0.40 \pm 0.04	2.3	15.073 \pm 10	5 ⁻
13.016 \pm 20	\approx 60	α_0	\approx 0.12	0.11	15.142 \pm 15	(2 ⁺)
13.056 \pm 10	230 \pm 25	α_0	0.70 \pm 0.04	5.5	15.174 \pm 10	5 ⁻
(13.238 \pm 10)	(130 \pm 20)	(α_0)	(0.99 \pm 0.08)		(15.319 \pm 10)	(1 ⁻)
(13.266 \pm 12)	(50 \pm 25)	(α_0)	(0.69 \pm 0.17)		(15.342 \pm 10)	(0 ⁺)
13.237 \pm 29	280 \pm 40	α_0	0.39 \pm 0.04	20	15.319 \pm 25	7 ⁻
13.251 \pm 6	34 \pm 10	α_0	0.29 \pm 0.05	0.2	15.330 \pm 5	4 ⁺
13.296 \pm 5	110 \pm 10	$\alpha_0, \gamma_{6.13}, \gamma_{6.9+7.1}$	0.71 \pm 0.04	14	15.366 \pm 5	7 ⁻
13.384 \pm 15 ^d	85 \pm 35	α_0	0.26 \pm 0.05	0.4	15.436 \pm 15	(3 ⁻)
13.58		$\alpha_0, \gamma_{6.13}, \gamma_{6.9+7.1}$			15.59	
13.73		$\alpha_0, \gamma_{6.13}, \gamma_{6.9+7.1}$			15.71	(6 ⁺)
14.05		$\alpha_0, \gamma_{6.13}, \gamma_{6.9+7.1}$			15.97	(6 ⁺)
14.26		$\gamma_{6.13}, \gamma_{6.9+7.1}$			16.14	
14.40		$\gamma_{6.13}$			16.25	
14.501 \pm 15	45	α_0, α_{1+2}			16.329 \pm 11	4 ⁺
14.636 \pm 15 ^g	35	$\alpha_0, \alpha_{1+2}, \alpha_3$			16.437 \pm 11	(0, 2, 4) ⁺
14.721 \pm 15	24 \pm 4	$\alpha_0, \alpha_{1+2}, \alpha_3, \alpha_4$	0.36 \pm 0.03	0.38 \pm 0.07	16.505 \pm 15	6 ⁺

Table 20.18 from (1987AJ02): Resonances in $^{16}\text{O}(\alpha, \alpha)^a$ (continued)

E_α (MeV \pm keV)	$\Gamma_{\text{c.m.}}$ (keV)	Outgoing particles	Γ_{α_0}/Γ	θ^2 (%)	E_x (MeV \pm keV)	J^π
14.789 \pm 18	90 \pm 30	α_0	0.16 \pm 0.03	0.37 \pm 0.13	16.559 \pm 15	5 ⁻
14.816 \pm 15	92 \pm 8	α_0, α_3	0.45 \pm 0.03	4.1 \pm 0.5	16.581 \pm 15	7 ⁻
14.875 \pm 22	80 \pm 25	α_0	0.18 \pm 0.04	0.22 \pm 0.08	16.628 \pm 20	3 ⁻
14.924 \pm 20	100 \pm 25	$\alpha_0, (\alpha_3)$	0.23 \pm 0.03	0.42 \pm 0.11	16.667 \pm 15	4 ⁺
14.987 \pm 18	\approx 25	$\alpha_0, \alpha_{1+2}, \alpha_3, \alpha_4$	0.08 \pm 0.03	\approx 0.05	16.717 \pm 15	5 ⁻
15.023 \pm 33	160 \pm 50	α_0	0.10 \pm 0.02	4.8 \pm 1.9	16.746 \pm 25	8 ⁺
15.149 \pm 16	16 \pm 8	$\alpha_0, \alpha_{1+2}, \alpha_3, \alpha_4$	0.11 \pm 0.02	0.04 \pm 0.02	16.847 \pm 15	5 ⁻
15.179 \pm 25	350 \pm 50	α_0	0.28 \pm 0.03	3.9 \pm 0.7	16.871 \pm 20	6 ⁺
15.430 \pm 21	180 \pm 30	α_0	0.32 \pm 0.03	1.0 \pm 0.2	17.072 \pm 20	4 ⁺
15.535 \pm 15	26 \pm 5	$\alpha_0, \alpha_{1+2}, \alpha_3, \alpha_4$	0.22 \pm 0.02	0.13 \pm 0.03	17.155 \pm 15	5 ⁻
15.607 \pm 19	225 \pm 30	α_0	0.32 \pm 0.02	1.2 \pm 0.2	17.213 \pm 15	4 ⁺
15.696 \pm 20	86 \pm 25	$\alpha_0, \alpha_{1+2}, \alpha_3, \alpha_4$	0.16 \pm 0.03	0.20 \pm 0.07	17.284 \pm 15	3 ⁻
15.710 \pm 17	200 \pm 25	α_0	0.26 \pm 0.02	11.6 \pm 1.4	17.295 \pm 15	8 ⁺
15.828 \pm 15 ^f	< 10	α_{1+2}			17.390 \pm 15	
15.878 \pm 18	220 \pm 25	α_0	0.24 \pm 0.01	48 \pm 6	17.430 \pm 15	9 ⁻
16.017 \pm 16	86 \pm 9	$\alpha_0, \alpha_{1+2}, \alpha_3, \alpha_4$	0.45 \pm 0.03	1.3 \pm 0.2	17.541 \pm 15	6 ⁺
16.099 \pm 17	140 \pm 20	α_0, α_4	0.36 \pm 0.03	1.05 \pm 0.15	17.606 \pm 15	5 ⁻
16.302 \pm 23	\approx 125	α_0	0.13 \pm 0.03	\approx 0.3	17.769 \pm 20	4 ⁺
16.405 \pm 17	200 \pm 30	α_0	0.38 \pm 0.03	1.6 \pm 0.3	17.851 \pm 15	5 ⁻
16.598 \pm 15 ^f	< 10	α_0, α_{1+2}			18.005 \pm 15	7 ⁻
16.622 \pm 6	34 \pm 7	$\alpha_0, \alpha_{1+2}, \alpha_3, \alpha_4$	0.34 \pm 0.04	0.23 \pm 0.06	18.024 \pm 5	5 ⁻
16.695 \pm 30	140 \pm 60	α_0	0.20 \pm 0.05	0.4 \pm 0.2	18.083 \pm 25	4 ⁺
16.748 \pm 6	29 \pm 6	$\alpha_0, \alpha_{1+2}, \alpha_3, \alpha_4$	0.46 \pm 0.06	0.8 \pm 0.2	18.125 \pm 5	7 ⁻

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E_α (MeV \pm keV)	$\Gamma_{\text{c.m.}}$ (keV)	Outgoing particles	Γ_{α_0}/Γ	θ^2 (%)	E_x (MeV \pm keV)	J^π
16.949 \pm 13	190 \pm 30	α_0, α_4	0.32 \pm 0.02	1.7 \pm 0.3	18.286 \pm 10	6 ⁺
17.129 \pm 24	185 \pm 40	$\alpha_0, (\alpha_{1+2}), \alpha_3, \alpha_4$	0.19 \pm 0.02	1.8 \pm 0.4	18.430 \pm 20	7 ⁻
17.210 \pm 21	130 \pm 30	α_0, α_3	0.21 \pm 0.03	0.5	18.494 \pm 20	5 ⁻
17.368 \pm 23	185 \pm 30	α_0, α_4	0.24 \pm 0.03	5.5 \pm 1.1	18.621 \pm 20	8 ⁺
17.524 \pm 29	140 \pm 50	α_0, α_{1+2}	0.17 \pm 0.04	0.6 \pm 0.3	18.745 \pm 25	6 ⁺
17.552 \pm 24	140 \pm 35	α_0	0.22 \pm 0.03	1.5 \pm 0.4	18.768 \pm 20	7 ⁻
17.793 \pm 29	200 \pm 60	α_0	0.15 \pm 0.02	3.2 \pm 1.1	18.960 \pm 25	8 ⁺
17.906 \pm 18	\approx 90	α_0, α_{1+2}	0.18 \pm 0.03	\approx 0.3	19.051 \pm 15	5 ⁻
18.03 \pm 20	200 \pm 50	$\alpha_0, \alpha_1, (\alpha_2), \alpha_4, \alpha_5$	0.38 \pm 0.04 ^d	\approx 2	19.15 \pm 20	6 ⁺
18.198 \pm 17	140 \pm 25	$\alpha_1, (\alpha_5)$	0.12 \pm 0.02 ^h		19.284 \pm 15	6 ⁺
18.216 \pm 30	430 \pm 60	α_0	0.36 \pm 0.03	6.4 \pm 1.1	19.298 \pm 25	7 ⁻
18.397 \pm 11	130 \pm 15	$\alpha_0, \alpha_3, \alpha_4$	0.38 \pm 0.01 ^h		19.443 \pm 10	6 ⁺
18.514 \pm 29	250 \pm 60	$\alpha_0, \alpha_2, \alpha_3$	0.27 \pm 0.04	1.6 \pm 0.4	19.536 \pm 25	6 ⁺
(18.563 \pm 25)	(140 \pm 50)	(α_1)	(0.09 \pm 0.02) ^h		(19.576 \pm 20)	(7 ⁻)
18.662 \pm 23	140 \pm 35	α_1	0.14 \pm 0.02 ^h		19.655 \pm 20	6 ⁺
18.757 \pm 28	330 \pm 60	$\alpha_0, (\alpha_2), \alpha_3$	0.23 \pm 0.02	6.3 \pm 1.2	19.731 \pm 20	8 ⁺
18.900 \pm 48	360 \pm 120	α_0	0.18 \pm 0.03	1.4 \pm 0.5	19.845 \pm 40	6 ⁺
18.918 \pm 11	170 \pm 25	α_1	0.26 \pm 0.02 ^h		19.859 \pm 10	5 ⁻
18.949 \pm 52	\approx 120	α_0	0.08 \pm 0.03	\approx 0.35	19.884 \pm 40	7 ⁻
19.083 \pm 39	130 \pm 100	$\alpha_0, \alpha_2, (\alpha_5)$	0.11 \pm 0.04	0.19 \pm 0.04	19.991 \pm 30	4 ⁺
19.128 \pm 16	80 \pm 35	α_1, α_4	0.10 \pm 0.04 ^h		20.027 \pm 15	6 ⁺
19.227 \pm 28	190 \pm 35	α_1	0.29 \pm 0.03 ^h		20.106 \pm 25	7 ⁻
19.304 \pm 47	285 \pm 100	α_0, α_3	0.18 \pm 0.04	1.1 \pm 0.4	20.168 \pm 35	6 ⁺

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E_α (MeV \pm keV)	$\Gamma_{\text{c.m.}}$ (keV)	Outgoing particles	Γ_{α_0}/Γ	θ^2 (%)	E_x (MeV \pm keV)	J^π
19.464 \pm 19	255 \pm 40	α_1, α_5	0.28 \pm 0.03 ^h		20.296 \pm 15	7 ⁻
19.521 \pm 22	190 \pm 40	α_1	0.26 \pm 0.03 ^h		20.341 \pm 20	5 ⁻
19.524 \pm 16	135 \pm 35	α_0, α_3	0.25 \pm 0.04	1.1 \pm 0.3	20.344 \pm 15	7 ⁻
19.618 \pm 39	215 \pm 90	α_0	0.14 \pm 0.03	0.6 \pm 0.3	20.419 \pm 30	6 ⁺
19.651 \pm 32	370 \pm 55	α_1	0.32 \pm 0.03 ^h		20.445 \pm 25	6 ⁺
19.679 \pm 35	280 \pm 70	α_0, α_2	0.20 \pm 0.03	0.86 \pm 0.25	20.468 \pm 30	5 ⁻
19.952 \pm 8	78 \pm 11	$\alpha_0, \alpha_1, \alpha_2, \alpha_3$	0.33 \pm 0.03 ^j	4.5 \pm 0.8	20.686 \pm 6	9 ⁻
20.04	240 \pm 50	$\alpha_0, \alpha_1, \alpha_4$	0.2 ^j	1.8 \pm 0.5	20.76 \pm 30	7 ⁻
20.095 \pm 32	170 \pm 60	α_1	0.11 \pm 0.02 ^h		20.800 \pm 25	5 ⁻
20.28	300 \pm 50	α_0, α_1	0.23 \pm 0.03 ^j	2.1 \pm 0.6	20.95 \pm 40	7 ⁻
20.423 \pm 8 ^g	60 \pm 6	α_0, α_3	0.46 \pm 0.03	4.1 \pm 0.5	21.062 \pm 6	9 ⁻
20.7	300	α_0			21.3	7 ⁻
21.3 \pm 200	300	α_0			21.8 \pm 150	7 ⁻
22.0 \pm 200	500	α_0			22.3 \pm 150	7 ⁻
22.5 \pm 250	500	α_0			22.7 \pm 200	9 ⁻
22.65 \pm 125	250	α_0			22.84 \pm 100	9 ⁻
23.3 \pm 250	500	α_0			23.4 \pm 200	8 ⁺
24.24 \pm 150	350	α_0			24.11 \pm 100	8 ⁺
25.4 \pm 300	600	α_0			25.0 \pm 250	8 ⁺
26.2 \pm 200	400	α_0			25.7 \pm 150	
28.1 \pm 350	700	α_0			27.2 \pm 300	
29	1600	α_0			28	8 ⁺
29.4 \pm 350	700	α_0			28.2 \pm 300	

^a For earlier references see Tables [20.23 in \(1978AJ03\)](#) and [20.21 in \(1983AJ01\)](#). For $K\pi$ assignments see [Table 20.15](#) here. The uncertainties in the excitation energies are calculated by taking the uncertainty in the E_α in the c.m. [$\frac{3}{4} \times$ uncertainty in the lab] and adding the uncertainty in E_b [2 keV], in quadrature, rounding upwards. I am indebted to Prof. H.T. Richards for many very useful comments.

^b $\Gamma_{\text{c.m.}} = \Gamma_\alpha$.

^c [\(1985JA17\)](#).

^d Resonances with $9.25 \leq E_\alpha \leq 13.39$ MeV are from [\(1985CA09\)](#), except for the states labelled ^f. Certain values are rounded upwards. See also [\(1983CA1F\)](#) and [Table 20.21 in \(1983AJ01\)](#).

^e $(2J + 1)\Gamma_{\alpha_0}\Gamma_{\alpha_2}/\Gamma_g = 81 \pm 12$ eV and 14 ± 2 eV, respectively, for $^{20}\text{N}^*(12.14, 12.25)$ [for the latter see [Table 20.17](#)] [\(1980FI01\)](#).

^f See [Table 20.21 in \(1983AJ01\)](#).

^g Resonances with $14.6 < E_\alpha < 20.4$ MeV are from the re-analysis of the data of [\(1979BI10\)](#) by [\(1984RI06\)](#). Certain values are rounded upwards.

^h $(\Gamma_{\alpha_0}\Gamma_{\alpha_1})^{1/2}/\Gamma$.

ⁱ [\(1984RI07\)](#).

^j For information on the α_1 strength see [\(1984RI06\)](#).