Table 16.13 from (1993TI07): Energy Levels of ^{16}O [a]

E_x (MeV ± keV)	J^π; T	K^π	$\Gamma_{c.m.}$ or τ_m (keV)	Decay	Reactions
0	0^+; 0		stable		5, 7, 11, 12, 13, 14, 15, 16, 17, 18, 19, 22, 23, 24, 30, 32, 33, 34, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82
6.0494 ± 1.0	0^+; 0	0^+	$\tau_m = 96 \pm 7$ psec	π	5, 7, 11, 12, 13, 15, 17, 19, 21, 23, 30, 32, 33, 34, 38, 39, 43, 44, 47, 54, 55, 57, 66, 67, 70, 71, 73, 79, 81
6.129893 ± 0.04	3^-; 0		$\tau_m = 26.6 \pm 0.7$ psec; $g = +0.556 \pm 0.004$	γ	1, 5, 7, 11, 12, 13, 15, 17, 18, 19, 21, 30, 31, 32, 33, 34, 37, 38, 39, 43, 44, 45, 46, 49, 50, 51, 53, 54, 66, 67, 68, 70, 71, 73, 79, 81
6.9171 ± 0.6	2^+; 0	0^+	$\tau_m = 6.78 \pm 0.19$ fsec	γ	1, 5, 7, 11, 12, 13, 15, 17, 19, 30, 31, 32, 33, 34, 37, 38, 42, 43, 44, 45, 46, 47, 49, 50, 53, 54, 55, 67, 68, 70, 71, 73, 78, 80
7.11685 ± 0.14	1^-; 0		$\tau_m = 12.0 \pm 0.7$ fsec	γ	1, 5, 7, 11, 12, 13, 17, 30, 31, 32, 33, 34, 37, 38, 39, 42, 43, 44, 46, 47, 50, 66, 67, 68, 70, 71, 73, 81
8.8719 ± 0.5	2^-; 0		$\tau_m = 180 \pm 16$ fsec	γ, α	5, 7, 11, 12, 16, 19, 30, 31, 33, 37, 38, 39, 43, 45, 46, 47, 49, 50, 67, 68, 73, 81
9.585 ± 11	1^-; 0	0^-	$\Gamma = 420 \pm 20$	γ, α	7, 9, 11, 12, 30, 38, 39, 45, 46, 47, 49, 50, 54, 55
9.8445 ± 0.5	2^+; 0	2^+ [b]	0.625 ± 0.100	γ, α	5, 7, 9, 11, 12, 19, 30, 31, 33, 37, 38, 39, 43, 46, 47, 49, 50, 54, 55, 66, 68, 70, 73, 78, 81
10.356 ± 3	4^+; 0	0^+	26 ± 3	γ, α	5, 7, 9, 11, 12, 13, 14, 16, 19, 21, 30, 31, 33, 38, 43, 46, 47, 49, 50, 54, 55, 61, 66, 68, 71, 73, 81
10.957 ± 1	0^-; 0		$\tau_m = 8 \pm 5$ fsec		5, 30, 37, 38, 46, 47, 68, 73
11.080 ± 3	3^+; 0	2^+ [b]	$\Gamma < 12$	γ	5, 30, 37, 38, 68, 73

Table 16.13 from (1993TI07): Energy Levels of ^{16}O [a] (continued)

E_x (MeV ± keV)	J^π; T	K^π	$\Gamma_{c.m.}$ or τ_m (keV)	Decay	Reactions
11.0967 ± 1.6	4^+; 0		0.28 ± 0.05	γ, α	5, 7, 9, 11, 13, 14, 16, 19, 30, 31, 43, 46, 47, 49, 50, 54, 55, 73
(11.26) [c]	(0^+; 0)		(2500)	(α)	9, 38
11.520 ± 4	2^+; 0		71 ± 3	γ, α	5, 7, 9, 19, 30, 43, 44, 46, 47, 49, 50, 54, 55, 61
11.60 ± 20	3^-; 0	0^-	800 ± 100	α	9, 14, 54, 55
12.049 ± 2	0^+; 0		1.5 ± 0.5	γ, α	9, 19, 23, 30, 43, 46, 47, 49, 50, 54, 55
12.440 ± 2	1^-; 0		91 ± 6	γ, p, α	7, 8, 9, 30, 34, 36, 37, 38, 43, 47, 50, 54, 55
12.530 ± 1	2^-; 0		$(97 \pm 10) \times 10^{-3}$	γ, p, α	5, 19, 30, 34, 36, 37, 38, 43, 46, 47, 50, 67
12.796 ± 4	0^-; 1		40 ± 4	p	30, 36, 37, 38, 46
12.9686 ± 0.4	2^-; 1		1.34 ± 0.04	γ, p, α	19, 30, 34, 36, 37, 38, 43, 66, 67, 68
13.020 ± 10	2^+; 0		150 ± 10	γ, p, α	7, 9, 43, 46, 47, 49, 50, 54, 55, 61
13.090 ± 8	1^-; 1		130 ± 5	γ, p, α	7, 8, 9, 11, 30, 37, 38, 43, 68
13.129 ± 10	3^-; 0		110 ± 30	γ, p, α	6, 7, 8, 9, 30, 38
13.259 ± 2	3^-; 1		21 ± 1	γ, p, α	7, 8, 9, 30, 36, 37, 38, 43, 46, 66, 67, 68, 70, 72
13.664 ± 3	1^+; 0		64 ± 3	γ, p, α	30, 34, 36, 47
13.869 ± 20	4^+; 0		89 ± 2	p, α	5, 9, 30, 36, 43, 45, 49, 50, 54, 55
13.980 ± 2	2^-		20 ± 2	p, α	5, 30, 31, 36
14.032 ± 15	0^+		185 ± 35	γ, α	9, 43
14.1 ± 100	3^-		750 ± 200	α	9
14.302 ± 3	$4^{(-)}$		34 ± 12		19, 30, 31
14.399 ± 2	5^+		27 ± 5		5, 12, 19, 30, 31
14.620 ± 20	$4^{(+)}$		490 ± 15	α	9, 11
14.660 ± 20	5^-	0^-	670 ± 15	α	9, 11, 12, 13, 14, 54, 55
14.8153 ± 1.6	6^+; 0		70 ± 8	α	5, 9, 11, 19, 30, 31, 49, 50, 54, 55
14.926 ± 2	2^+		54 ± 5	p, α	5, 30, 36, 43
15.097 ± 5	0^+		166 ± 30	p, α	8, 9, 30, 36
15.196 ± 3	2^-; 0		63 ± 4	p, α	30, 31, 36, 43, 46, 49, 66, 67, 68
15.26 ± 50	2^+; (0)		300 ± 100	p, α	36, 43, 46, 49

Table 16.13 from (1993TI07): Energy Levels of ^{16}O [a] (continued)

E_x (MeV ± keV)	J^π; T	K^π	$\Gamma_{c.m.}$ or τ_m (keV)	Decay	Reactions
15.408 ± 2	3^-; 0		132 ± 7	p, α	8, 9, 30, 31, 36, 43, 46, 50, 54, 55, 61, 66, 67, 68
15.785 ± 5	3^+		40 ± 10		19, 30, 31
15.828 ± 30	3^-		700 ± 120	α	9, 43
16.20 ± 90	1^-; 0		580 ± 60	γ, p, α	7, 30, 36
16.209 ± 2	1^+; 1		19 ± 3	γ, n, p	30, 31, 34, 35, 36, 41, 43
16.275 ± 7	6^+	0^+ [b]	420 ± 20	α	5, 9, 11, 12, 13, 14, 21, 31, 54, 55, 61
16.352 ± 8	(2^+) [d]		61 ± 8	p, α	8, 9, 30, 36, 46, 49, 50, 70
16.4423 ± 1.6	2^+; 1		25 ± 2	γ, n, p, α	7, 8, 9, 30, 36, 43
16.817 ± 2	$(3^+; 1)$ [b,e]		28 ± 3	γ, p, α	19, 30, 34, 36
16.844 ± 21	4^+		570 ± 60	α	9
16.93 ± 50	2^+		≈ 280	α, ^{8}Be	9, 10
17.09 ± 40	1^-; 1		380 ± 40	γ, p	34, 36
17.129 ± 5	2^+		107 ± 14	n, p, α	8, 9
17.140 ± 10	1^+; 1		34 ± 3	γ, n, p, α	9, 34, 35, 36, 43
17.197 ± 17	2^+		160 ± 60	α, ^{8}Be	5, 9, 10, 31, 38, 46, 49, 50
17.282 ± 11	1^-; 1		78 ± 5	γ, n, p, α	8, 34, 35, 36, 41, 43
17.510 ± 26	1^-		180 ± 60	α	9
17.555 ± 21	(6^+)		180 ± 70	n, α	8, 9
17.609 ± 7	2^+; (1)		114 ± 14	p, α	8, 9, 36
17.72	$(0^+, 2^+)$		≈ 75	p, α, ^{8}Be	9, 10
17.775 ± 11	4^-; 0		45 ± 7	p	19, 43, 44, 46, 49, 50, 67, 68
17.784 ± 15	4^+		400 ± 40	n, α, ^{8}Be	8, 9, 10, 43, 54, 55
17.877 ± 6	$(2)^-$; 1 [b]		24 ± 3	γ, p, (α)	34, 36, 41
18.016 ± 1	4^+; (0)		14 ± 2	n, p, α, ^{8}Be	8, 9, 10, 19
18.029 ± 5	$3^{(-)}$; 1		26 ± 4	γ, n, p, α	19, 34, 35, 36, 43, 67
18.089 ± 25	(0^+)		288 ± 44	(γ), n, p, α	7, 8, 9, 35, 46, 50
18.202 ± 8	2^+		220 ± 50	γ, p	36, 43, 46, 50
18.29			≈ 380	γ, p, α	7, 8, 9
18.404 ± 12	5^-		550 ± 40	α	9
18.430 ± 15	2^+; 0		90 ± 40	p	36, 46, 49, 50
18.484 ± 6	$(1^-, 2^-)$		35 ± 6	p	36
18.6	$(1^-, 5^-)$		≈ 150	α	9
18.6	(4^+)		≈ 300	α, ^{8}Be	9, 10
18.640 ± 15	(5^+)		22 ± 7	(n, p)	5, 19, 43
18.773 ± 22	1^-		215 ± 45	p, α	8, 9

Table 16.13 from (1993TI07): Energy Levels of ^{16}O [a] (continued)

E_x (MeV ± keV)	J^π; T	K^π	$\Gamma_{c.m.}$ or τ_m (keV)	Decay	Reactions
18.785 ± 6	4^+		260 ± 20	n, p, α, ^{8}Be	8, 9, 10
18.79 ± 10	1^+; 1		120 ± 20	γ, p	34, 36, 43
18.977 ± 6	4^-; 1		8.2 ± 3.8	γ, p, α	19, 34, 36, 43, 44, 46, 49, 67, 68
19.001 ± 24	2^-; 1		420 ± 50	γ, p	34, 36, 43
19.08 ± 30	2^+; (1)		≈ 120	γ, (n), p, α	8, 9, 14, 34, 36
19.206 ± 12	3^-; 1		68 ± 10		43, 67, 68
19.253 ± 30	(5^-)		50 ± 45	n, α	8, 9
19.257 ± 9	2^+; (1)		155 ± 25	γ, p, α	8, 9, 34, 36
19.319 ± 14	(6^+)		65 ± 35	p, α, ^{8}Be	8, 9, 10
19.375 ± 2	4^+		23 ± 4	p, α	8, 9
19.47 ± 30	1^-; 1		200 ± 70	γ, p	34, 36, 43
19.539 ± 19	2^+; 0		255 ± 75	n, α	5, 8, 9, 46, 50
19.754 ± 16	2^+		290 ± 50	p, α	8, 9
19.808 ± 11	4^-; 0		32 ± 4		19, 44, 46, 67, 68
19.895 ± 7	3; 1		42 ± 9	γ, p, α	5, 34, 36
20.055 ± 13	2^+; 0		400 ± 32	γ, n, p, α	7, 8, 9, 49, 50
20.412 ± 17	$(2^-, 4^+)$; 1		190 ± 20	γ, n, p	34, 35, 36, 43, 67, 68
20.510 ± 0.025	$(4^-; 1)$	50 ± 30	γ		43
20.541 ± 2	$5^-; 1$		11 ± 2	p, α	5, 8, 9
20.560 ± 2	even π		< 5	p, α	8, 9
20.615 ± 3	even π		< 10	α	9
(20.8)			(≈ 60)	n, p, α	8
20.857 ± 14	7^-	0^-	900 ± 60	α	9, 11, 12, 13, 14
20.945 ± 20	1^-; 1		300 ± 10	γ, n, p	34, 35, 36, 43
21.05 ± 50	(2^+; 0)		298 ± 43		46, 50
21.052 ± 6	6^+		205 ± 15	α	9
21.175 ± 15					5
21.50	$(1 \rightarrow 4)$		120	p	36
21.623 ± 11	7^-		60 ± 30	n, p, α	8, 9
21.648 ± 3	6^+		115 ± 8	n, α	8, 9, 11
21.776 ± 9	3^-		43 ± 20	n, p, α	5, 8, 9
22.04	0^+		60	n, d, α	8, 25
22.150 ± 10	1^-; 1		680 ± 10	γ, n, p, d, α	14, 24, 26, 29, 34, 35, 36, 40, 41, 42
22.35	2^+		175	n, d, α	25, 29
22.5 ± 100	3^-		400 ± 50	p, d, α	26, 29, 50
22.65 ± 30			60	n, α, ^{8}Be	5, 8, 10

Table 16.13 from (1993TI07): Energy Levels of ^{16}O [a] (continued)

E_x (MeV ± keV)	J^π; T	K^π	$\Gamma_{c.m.}$ or τ_m (keV)	Decay	Reactions
22.721 ± 3	0^+; 2		12.5 ± 2.5	n, p, d, α	8, 9, 23, 26, 29, 70
22.89 ± 10	1^-; 1		300 ± 10	γ, p, d	24, 26, 34, 36
23.0 ± 100	6^+		$\lesssim 500$	(d), α, ^{8}Be	10, 11, 29
23.1			≈ 20	(n), d, α, ^{8}Be	9, 10, 25, 29
23.235 ± 62	$(1^-; 1)$		560 ± 150	n, p, d	25, 26, 27, 35, 46
23.51 ± 30	(5^-)		300	p, d, α	5, 9, 14, 26, 27, 29, 49, 50
23.879 ± 6	6^+		26 ± 4	p, α, ^{8}Be	8, 9, 10, 11
24.07 ± 30	1^-; 1		550 ± 40	γ, p, ^{3}He	17, 34, 36, 46
24.36 ± 70	$(2^+, 3^-)$; 0		424 ± 45	n, p	35, 50
24.522 ± 11	2^+; 2		< 50		23, 70
24.76 ± 50	$(2, 4)^+$; 1		340 ± 60	γ, n, p	34, 35, 36
25.12 ± 50	1^-; 1		3000 ± 300	γ, p, ^{3}He, α	17, 34, 36, 42, 49
25.50 ± 150	1^-; 1		1300 ± 300	γ	43, 46
25.6	(3^-); 1		450	^{3}He, α	9, 17
26.0 ± 100	1^-; (1)		500–1000	γ, ^{3}He, α	17
26.363 ± 62	$(2, 4)^+$; 1		550 ± 70	γ, n, p, α	9, 34, 35, 36
27.35 ± 100	$(2, 4)^+$; 1		830 ± 110	γ, p, ^{3}He, α, ^{8}Be	17, 34, 36
27.5	$(3^-; 0)$		≈ 2500	γ, ^{3}He	17
28.2	7^-		1000	α	9, 11
28.6 ± 200				γ, ^{3}He	17
29.0	7^-		1000	p, α	9, 11
29.8 ± 100	$9^- + 8^+$		$500 - 1000$	^{3}He, α	14, 17
31.8 ± 600				γ, α	11, 42
34	$10^+(9^-)$		2300	α	9, 11
35				α	11

[a] See also Tables 16.14 and 16.26.

[b] D.J. Millener, private communication.

[c] See (1986AJ04).

[d] See reaction 70 and (1986VO10).

[e] (1983SN03). See also Table 16.22.