Adopted Levels 1991Aj01

History

Type	Author	Citation	Literature Cutoff Date
Update	F. Ajzenberg-selove, J. H. Kelley and C. D. Nesaraja	NP A523,1 (1991)	1-Jul-1990

Q(β^-)=−2.396×10^4 *5*; S(n)=23179 *10*; S(p)=4627.0 *3*; Q(α)=−10116.2 *4* 2012Wa38
Note: Current evaluation has used the following Q record 23176 10 *4627*.9728-10117.1 *4* 1997Au04.

^{14}O Levels

Cross Reference (XREF) Flags

A	^{12}C(^{3}He,n)	E	^{14}N(p,n)
B	^{12}C(^{12}C,^{10}Be)	F	^{14}N(^{3}He,t)
C	^{13}C(p,π^-)	G	^{16}O(p,t)
D	^{13}N(p,γ)		

E(level)	J$^\pi$	T$_{1/2}$	XREF	Comments
0.0	0$^+$	70.606 s *18*	ABC EFG	%ε+%β^+=100 T=1 T$_{1/2}$: Weighted average: 70.59 s *3* (1973Cl12), 70.613 s *25* (1978Wi04). Others: 70.43 s *18* (1974Az01), 70.48 s *5* (1972Al01).
5173† *10*	1$^-$	38.1 keV *18*	A CDEFG	T=1
5920 *10*	0$^+$	≤50 keV	A FG	%p=100 T=1
6272 *10*	3$^-$	103 keV *6*	ABC FG	%p=100 T=1
6590 *10*	2$^+$	≤60 keV	ABC FG	%p=100 T=1
6790?† *30*	$^-$		C F	
7768 *10*	2$^+$	76 keV *10*	A C EFG	%p=100 T=1
8720?† *40*			FG	
9715† *20*	(2$^+$)		A C G	T=1
9915† *20*	4$^+$	100 keV *50*	ABC F	T=1
10890† *50*			C F	
11240† *50*			F	
11970†			C F	Possible multiplet.
12840† *50*			F	
13010† *50*			F	
14150† *40*	(5$^-$)		BC F	
14640† *60*			C F	
17400† *60*			C F	

† Decay mode unspecified.

Adopted Levels, Gammas 1993Ti07

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	J. H. Kelley, D. R. Tilley, H. R. Weller and C. M. Cheves	NP 564 1 (1993)	31-Dec-1992

Q(β^-)=−15417 *9*; S(n)=15663.9 *5*; S(p)=1.213×10^4; Q(α)=−7162 2012Wa38
Note: Current evaluation has used the following Q record −15417 8 *15663.7 5* 12127.41 *1*−7161.91 *1* 1997Au04.
See other reaction references in 1993Ti07.

^{16}O Levels

Cross Reference (XREF) Flags

A	^{12}C(α,X)	G	^{15}N(p,n)	M	^{16}O(d,d′)
B	^{13}C(^{3}He,X)	H	^{15}N(d,n)	N	^{16}O(^{3}He,^{3}He)
C	^{13}C(^{6}Li,t)	I	^{15}N(^{3}He,d)	O	^{16}O(α,α)
D	^{14}N(d,X)	J	^{16}N β^- decay	P	^{17}O(d,t)
E	^{14}N(^{3}He,p)	K	^{16}O(e,e′)	Q	^{17}O(^{3}He,α)
F	^{15}N(p,X)	L	^{16}O(p,p′)		

E(level)	J$^\pi$	T$_{1/2}$	XREF	Comments
0.0	0$^+$	stable	ABCDEF HIJKLMNOPQ	T=0
6049.4 *10*	0$^+$	67 ps *5*	ABC EF IJK M P	T=0
6129.89 *4*	3$^-$	18.4 ps *5*	ABC EF HIJKL NOPQ	T=0; μ=+1.668 *12* (1989Ra17)
6917.1 *6*	2$^+$	4.70 fs *13*	ABC EF HI KLMNOPQ	T=0
7116.85 *14*	1$^-$	8.3 fs *5*	AB EF HIJKLM OPQ	T=0
8871.9 *5*	2$^-$	125 fs *11*	A C E HIJKLMNOPQ	T=0
9585 *11*	1$^-$	420 keV *20*	A E IJ LMNO	%IT=6.7×10^{-6} *10*; %α=100 Γ_γ=0.028 eV *4*; T=0
9844.5 *5*	2$^+$	0.62 keV *10*	A C E HIJKLMNO Q	%IT=0.0016 *3*; %α=100 Γ_γ=0.0098 eV *8*; T=0
10356 *3*	4$^+$	26 keV *3*	A C E I KLMNO Q	%IT=2.4×10^{-4} *4*; %α=100 Γ_γ=0.062 eV *6*; T=0
10957 *1*	0$^-$	5.5 fs *35*	E HI LM Q	T=0
11080 *3*	3$^+$	<12 keV	E HI Q	T=0
11096.7 *16*	4$^+$	0.28 keV *5*	A C E KLMNO	%IT=0.0020 *6*; %α=100 Γ_γ=0.0056 eV *14*; T=0
11260?	(0$^+$)	2500 keV	A I	%α=100 T=(0) α decay mode is tentative.
11520 *4*	2$^+$	71 keV *3*	A C E KLMNO	%IT=9.4×10^{-5} *3*; %α=100 Γ_γ=0.67 eV *2*; T=0
11600 *20*	3$^-$	800 keV *100*	A	%α=100 T=0
12049 *2*	0$^+$	1.5 keV *5*	A C E KLMNO	%IT=?; %α=100 T=0
12440 *2*	1$^-$	91 keV *6*	A EF HI K M O	%IT=0.0132 *24*; %p=0.9 *1*; %α=99.1 *1* Γ_γ=12 eV *2*; T=0
12530 *1*	2$^-$	0.111 keV *10*	C EF HI KLM OP	%IT=3.2 *3*; %p=14 *7*; %α=83 *3* Γ_γ=3.5 eV *2*; T=0 Γ,%IT,%p,%α: from 1986Zi08. 1993Ti07 adopt Γ=0.097 keV 10.
12796 *4*	0$^-$	40 keV *4*	EF HI L	%IT=0.0062 *8*; %p=100 Γ_γ=2.5 eV *2*; T=1
12968.6 *4*	2$^-$	1.34 keV *4*	C EF HI K PQ	%IT=0.28 *3*; %p=78 *4*; %α=22 *4* Γ_γ=3.7 eV *3*; T=1 %IT,%p,%α: from 1986Zi08.

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas 1993Ti07 (continued)

^{16}O Levels (continued)

E(level)	J^{π}	$T_{1/2}$	XREF	Comments
13020 *10*	2^+	150 keV *10*	A KLMNO	%IT=?; %p=?; %α=? T=0
13090 *8*	1^-	130 keV *5*	A E HI K Q	%IT=0.026 *4*; %p=71; %α=29 Γ_γ=34 eV *5*; T=1
13129 *10*	3^-	110 keV *30*	A E I	%IT=?; %p=1; %α=99 T=0
13259 *2*	3^-	21 keV *1*	A EF HI KL PQ	%IT=?; %p=?; %α=? T=1
13664 *3*	1^+	64 keV *3*	EF M	%IT<0.0015; %p=14; %α=86 T=0
13869 *2*	4^+	89 keV *2*	A EF K NO	%IT=?; %p=0.6; %α=99.4 T=0 E(level): uncertainty taken from table 16.21 (M. J. Martin). Table 16.13 gives ΔE=20 keV.
13980 *2*	2^-	20 keV *2*	EF	%p=?; %α=?
14032 *15*	0^+	185 keV *35*	A K	%IT=?; %α=100
1410×10[1] *10*	3^-	750 keV *200*	A	%α=100
14302† *3*	$4^{(-)}$	34 keV *12*	C E	
14399† *2*	5^+	27 keV *5*	C E	
14620 *20*	$4^{(+)}$	490 keV *15*	A	%α=100
14660 *20*	5^-	670 keV *15*	A	%α=100
14815.3 *16*	6^+	70 keV *8*	A C E NO	%α=100 T=0
14926 *2*	2^+	54 keV *5*	EF K	%p=?; %α=?
15097 *5*	0^+	166 keV *30*	A EF	%p=?; %α=?
15196 *3*	2^-	63 keV *4*	EF KL N PQ	%p=?; %α=? T=0
15260 *50*	2^+	300 keV *100*	F KL N	%p=?; %α=? T=(0)
15408 *2*	3^-	132 keV *7*	A EF KL OPQ	%p=?; %α=? T=0
15785† *5*	3^+	40 keV *10*	C E	
15828 *30*	3^-	700 keV *120*	A K	%α=100
16200 *90*	1^-	580 keV *60*	A EF	%IT=?; %p=?; %α=? T=0
16209 *2*	1^+	19 keV *3*	EFG K	%IT=?; %n=?; %p=? T=1
16275 *7*	6^+	420 keV *20*	A	%α=100
16352 *8*	(2^+)	61 keV *8*	A EF L NO	%p=?; %α=?
16442.3 *16*	2^+	25 keV *2*	A EF K	%IT=?; %n=?; %p=?; %α=? T=1
16817 *2*	(3^+)	28 keV *3*	C EF	%IT=?; %p=?; %α=? T=(1)
16844 *21*	4^+	570 keV *60*	A	%α=100
16930 *50*	2^+	≈280 keV	A	%α=?; %^{8}Be=?
17090 *40*	1^-	380 keV *40*	F	%IT=?; %p=100 T=1
17129 *5*	2^+	107 keV *14*	A	%n=?; %p=?; %α=?
17140 *10*	1^+	34 keV *3*	A FG K	%IT=?; %n=?; %p=?; %α=? T=1
17197 *17*	2^+	160 keV *60*	A I L NO	%α=?; %^{8}Be=?
17282 *11*	1^-	78 keV *5*	A FG K	%IT=?; %n=?; %p=?; %α=? T=1
17510 *26*	1^-	180 keV *60*	A	%α=100
17555 *21*	(6^+)	180 keV *70*	A	%n=?; %α=?

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas 1993Ti07 (continued)

^{16}O Levels (continued)

E(level)	J^{π}	$T_{1/2}$	XREF	Comments
17609 *7*	2^+	114 keV *14*	A F	%α=? T=(1)
17720	$(0^+,2^+)$	≈75 keV	A	%p=?; %α=?; %^{8}Be=?
17775 *11*	4^-	45 keV *7*	C KL NOPQ	%p=100 T=0
17784 *15*	4^+	400 keV *40*	A K	%n=?; %α=?; %^{8}Be=?
17877 *6*	$(2)^-$	24 keV *3*	F	%IT=?; %p=?; %α=? T=(1) The α decay mode is tentative.
18016 *1*	4^+	14 keV *2*	A C	%n=?; %p=?; %α=?; %^{8}Be=? T=(0)
18029 *5*	$3^{(-)}$	26 keV *4*	C FG K P	%IT=?; %n=?; %p=?; %α=? T=1
18089 *25*	(0^+)	288 keV *44*	A G L O	%IT=?; %n=?; %p=?; %α=? The IT decay mode is tentative.
18202 *8*	2^+	220 keV *50*	F KL O	%IT=?; %p=100
18290		≈380 keV	A	%IT=?; %p=?; %α=?
18404 *12*	5^-	550 keV *40*	A	%α=100
18430 *15*	2^+	90 keV *40*	F L NO	%p=100 T=0
18484 *6*	$(1^-,2^-)$	35 keV *6*	F	%p=100
18600	$(1^-,5^-)$	≈150 keV	A	%α=100
18600	(4^+)	≈300 keV	A	%α=?; %^{8}Be=?
18640 *15*	(5^+)	22 keV *7*	C K	%n=?; %p=? The neutron and proton decay modes are tentative.
18773 *22*	1^-	215 keV *45*	A	%p=?; %α=?
18785 *6*	4^+	260 keV *20*	A	%n=?; %p=?; %α=?; %^{8}Be=?
18790 *10*	1^+	120 keV *20*	F K	%IT=?; %p=100 T=1
18977 *6*	4^-	8 keV *4*	C F KL N PQ	%IT=?; %p=?; %α=? T=1
19001 *24*	2^-	420 keV *50*	F K	%IT=?; %p=100 T=1
19080 *30*	2^+	≈120 keV	A F	%IT=?; %n=?; %p=?; %α=? T=(1) The neutron decay mode is tentative.
19206† *12*	3^-	68 keV *10*	K PQ	T=1
19253 *30*	(5^-)	50 keV *45*	A	%n=?; %α=?
19257 *9*	2^+	155 keV *25*	A F	%IT=?; %p=?; %α=? T=(1)
19319 *14*	(6^+)	65 keV *35*	A	%p=?; %α=?; %^{8}Be=?
19375 *2*	4^+	23 keV *4*	A	%p=?; %α=?
19470 *30*	1^-	200 keV *70*	F K	%IT=?; %p=100 T=1
19539 *19*	2^+	255 keV *75*	A L O	%n=?; %α=? T=0
19754 *16*	2^+	290 keV *50*	A	%p=?; %α=?
19808† *11*	4^-	32 keV *4*	C L PQ	T=0
19895 *7*	3	42 keV *9*	F	%IT=?; %p=?; %α=? T=1
20055 *13*	2^+	400 keV *32*	A NO	%IT=?; %n=?; %p=?; %α=? T=0
20412 *17*	$(2^-,4^+)$	190 keV *20*	FG K PQ	%IT=?; %n=?; %p=? T=1
20510 *25*	(4^-)	50 keV *30*	K	%IT=100

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas 1993Ti07 (continued)

^{16}O Levels (continued)

E(level)	J^{π}	$T_{1/2}$	XREF	Comments
				T=(1)
20541 *2*	5^-	11 keV *2*	A	%p=?; %α=?
				T=1
20560 *2*	‡	<5 keV	A	%p=?; %α=?
20615 *3*	‡	<10 keV	A	%α=100
20800?		≈60 keV	A	%n=?; %p=?; %α=?
				$T_{1/2}$: author quotes Γ=(≈60).
20857 *14*	7^-	900 keV *60*	A	%α=100
20945 *20*	1^-	300 keV *10*	FG K	%IT=?; %n=?; %p=?
				T=1
21050† *50*	(2^+)	298 keV *43*	L O	T=(0)
21052 *6*	6^+	205 keV *15*	A	%α=100
21175† *15*				
21500	(1 to 4)	120 keV	F	%p=100
21623 *11*	7^-	60 keV *30*	A	%n=?; %p=?; %α=?
21648 *3*	6^+	115 keV *8*	A	%n=?; %α=?
21776 *9*	3^-	43 keV *20*	A	%n=?; %p=?; %α=?
22040	0^+	60 keV	A	%n=?; %d=?; %α=?
22150 *10*	1^-	680 keV *10*	D FG	%IT=?; %n=?; %p=?; %d=?; %α=?
				T=1
22350	2^+	175 keV	D	%n=?; %d=?; %α=?
2250×10[1] *10*	3^-	400 keV *50*	D O	%p=?; %d=?; %α=?
22650 *30*		60 keV	A	%n=?; %α=?; %^{8}Be=?
22721 *3*	0^+	12.5 keV *25*	A D	%n=?; %p=?; %d=?; %α=?
				T=2
22890 *10*	1^-	300 keV *10*	D F	%IT=?; %p=?; %d=?
				T=1
2300×10[1] *10*	6^+	≤500 keV	D	%d=?; %α=?; %^{8}Be=?
				The deuteron decay mode is tentative.
23100		≈20 keV	A D	%n=?; %d=?; %α=?; %^{8}Be=?
				The neutron decay mode is tentative.
23235 *62*	(1^-)	560 keV *150*	D G L	%n=?; %p=?; %d=?
				T=(1)
23510 *30*	(5^-)	300 keV	A D N	%p=?; %d=?; %α=?
23879 *6*	6^+	26 keV *4*	A	%p=?; %α=?; %^{8}Be=?
24070 *30*	1^-	550 keV *40*	B F L	%IT=?; %p=?; %^{3}He=?
				T=1
24360 *70*	$(2^+,3^-)$	424 keV *45*	G O	%n=?; %p=?
				T=0
24522† *11*	2^+	<50 keV		T=2
24760 *50*	$(2,4)^+$	340 keV *60*	FG	%IT=?; %n=?; %p=?
				T=1
25120 *50*	1^-	3000 keV *300*	B F	%IT=?; %p=?; %^{3}He=?; %α=?
				T=1
2550×10[1] *15*	1^-	1300 keV *300*	KL N	%IT=?
				T=1
25600	(3^-)	450 keV	AB	%^{3}He=?; %α=?
				T=1
2600×10[1] *10*	1^-	750 keV *250*	B	%IT=?; %^{3}He=?; %α=?
				T=(1)
				$T_{1/2}$: author quotes Γ=500-1000.
26363 *62*	$(2,4)^+$	550 keV *70*	A FG	%IT=?; %n=?; %p=?; %α=?
				T=1

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas 1993Ti07 (continued)

^{16}O Levels (continued)

E(level)	J^{π}	$T_{1/2}$	XREF	Comments
2735×10[1] *10*	(2,4)$^{+}$	830 keV *110*	B F	%IT=?; %p=?; %^{3}He=?; %α=?; %^{8}Be=? T=1
27500	(3^{-})	≈2500 keV	B	%IT=?; %^{3}He=100 T=(0)
28200	7^{-}	1000 keV	A	%α=100
2860×10[1] *20*			B	%IT=?; %^{3}He=100
29000	7^{-}	1000 keV	A	%p=?; %α=?
2980×10[1] *10*	9^{-} & 8^{+}	750 keV *250*	B	%^{3}He=?; %α=? $T_{1/2}$: author quotes Γ=500-1000.
3180×10[1] *60*				%IT=?; %α=?
34000	10^{+},(9^{-})	2300 keV	A	%α=100
35000			A	%α=100

† Decay mode not specified.
‡ π=even.

$\gamma(^{16}O)$

E_i(level)	J_i^{π}	E_γ	I_γ	E_f	J_f^{π}	Mult.	δ‡	$I_{(\gamma+ce)}$	Comments
6049.4	0^{+}	6048.2 *10*		0.0	0^{+}	[E0]		100	
6129.89	3^{-}	6128.63 *4*	100	0.0	0^{+}	[E3]			B(E3)(W.u.)=13.5 *7*
6917.1	2^{+}	787.2 *6*	≤0.008	6129.89	3^{-}	[E1]			B(E1)(W.u.)≤4×10^{-5}
		867.7 *12*	0.027 *3*	6049.4	0^{+}	[E2]			B(E2)(W.u.)=27 *3*
		6915.5 *6*	100	0.0	0^{+}	[E2]			B(E2)(W.u.)=3.1 *1*
7116.85	1^{-}	986.93 *15*	0.070 *14*	6129.89	3^{-}	[E2]			B(E2)(W.u.)=21 *5*
		1067.5 *10*	<6×10^{-4}	6049.4	0^{+}	[E1]			B(E1)(W.u.)≤6×10^{-7}
		7115.15 *14*	100	0.0	0^{+}	[E1]			B(E1)(W.u.)=3.5×10^{-4} *2*
8871.9	2^{-}	1754.9 *6*	14.7 *7*	7116.85	1^{-}	[M1+E2]	2.1 *4*		B(M1)(W.u.)=7×10^{-4} *3*; B(E2)(W.u.)=10.3 *15*
		1954.7 *8*	4.6 *7*	6917.1	2^{+}	[E1]			B(E1)(W.u.)=4.7×10^{-5} *9*
		2741.5 *5*	100 *21*	6129.89	3^{-}	[M1+E2]	2.9 *2*		B(M1)(W.u.)=6.9×10^{-4} *9*; B(E2)(W.u.)=8.2 *7*
		2822.2 *12*	0.15 *5*	6049.4	0^{+}	[M2]			B(M2)(W.u.)=0.18 *6*
		8869.3 *5*	9.3 *10*	0.0	0^{+}	[M2]			B(M2)(W.u.)=0.050 *8*
9585	1^{-}	2688 *11*	12 *4*	6917.1	2^{+}	[E1]			B(E1)(W.u.)=3.5×10^{-4} *12*
		9582 *11*	100 *16*	0.0	0^{+}	[E1]			B(E1)(W.u.)=6.6×10^{-5} *11*
9844.5	2^{+}	2927.1 *8*	34 *7*	6917.1	2^{+}	[M1]			B(M1)(W.u.)=0.0042 *8*
		3794.6 *12*	30 *7*	6049.4	0^{+}	[E2]			B(E2)(W.u.)=1.2 *3*
		9841.2 *5*	100 *7*	0.0	0^{+}	[E2]			B(E2)(W.u.)=0.031 *3*
10356	4^{+}	3439 *3*	100 *10*	6917.1	2^{+}	[E2]			B(E2)(W.u.)=65 *6*
		4225 *3*	<1.6	6129.89	3^{-}	[E1]			B(E1)(W.u.)<3×10^{-5}
		10352 *3*	9×10^{-5} *3*	0.0	0^{+}	[E4]			B(E4)(W.u.)=3.7 *13*
10957	0^{-}	3839.6 *10*	100	7116.85	1^{-}	[M1]			B(M1)(W.u.)=0.07 *4*
11096.7	4^{+}	4179.0 *17*	81 *20*	6917.1	2^{+}	[E2]			B(E2)(W.u.)=1.0 *3*
		4966.0 *16*	100 *42*	6129.89	3^{-}	[E1]			B(E1)(W.u.)=5.9×10^{-5} *25*
11520	2^{+}	4402 *4*	≤0.9	7116.85	1^{-}	[E1]			B(E1)(W.u.)≤1×10^{-4}
		4602 *4*	4.4 *11*	6917.1	2^{+}	[M1]			B(M1)(W.u.)=0.014 *4*
		5470 *5*	4.6 *8*	6049.4	0^{+}	[E2]			B(E2)(W.u.)=3.1 *5*
		11516 *4*	100.0 *13*	0.0	0^{+}	[E2]			B(E2)(W.u.)=1.5 *5*
12049	0^{+}	12044.1 *20*		0.0	0^{+}	[E0]		100	
12440	1^{-}	6389.2 *23*	1.2 *4*	6049.4	0^{+}	[E1]			B(E1)(W.u.)=0.0011 *4*

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas 1993Ti07 (continued)

$\gamma(^{16}O)$ (continued)

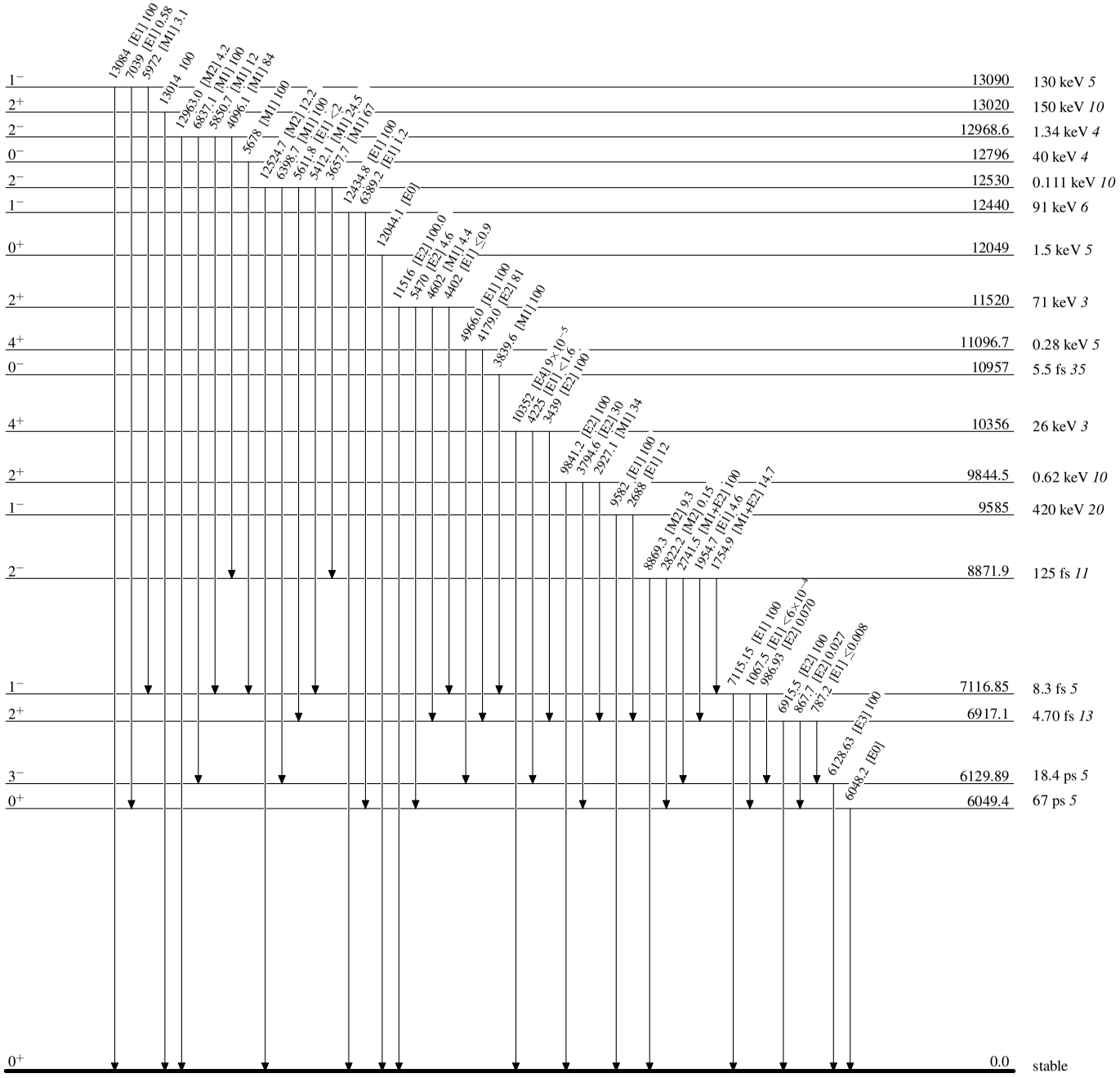
E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	Comments
12440	1^-	12434.8 *20*	100	0.0	0^+	[E1]	B(E1)(W.u.)=0.014 *2*
12530	2^-	3657.7 *12*	67† *4*	8871.9	2^-	[M1]	B(M1)(W.u.)=1.2 *1*
		5412.1 *10*	24.5† *14*	7116.85	1^-	[M1]	B(M1)(W.u.)=0.12 *1*
		5611.8 *12*	<2†	6917.1	2^+	[E1]	B(E1)(W.u.)<4.5×10^{-4}
		6398.7 *10*	100† *4*	6129.89	3^-	[M1]	B(M1)(W.u.)=0.31 *2*
		12524.7 *10*	12.2† *12*	0.0	0^+	[M2]	B(M2)(W.u.)=1.12 *17*
12796	0^-	5678 *4*	100	7116.85	1^-	[M1]	B(M1)(W.u.)=0.65 *6*
12968.6	2^-	4096.1 *7*	84† *4*	8871.9	2^-	[M1]	B(M1)(W.u.)=1.04 *12*
		5850.7 *5*	12† *2*	7116.85	1^-	[M1]	B(M1)(W.u.)=0.05 *1*
		6837.1 *4*	100† *4*	6129.89	3^-	[M1]	B(M1)(W.u.)=0.27 *3*
		12963.0 *4*	4.2† *8*	0.0	0^+	[M2]	B(M2)(W.u.)=1.0 *3*
13020	2^+	13014 *10*	100	0.0	0^+		$\Gamma_{\gamma0}$=0.7 eV *2*.
13090	1^-	5972 *8*	3.1 *8*	7116.85	1^-	[M1]	B(M1)(W.u.)=0.31 *9*
		7039 *8*	0.58 *12*	6049.4	0^+	[E1]	B(E1)(W.u.)=0.0017 *6*
		13084 *8*	100	0.0	0^+	[E1]	B(E1)(W.u.)=0.033 *5*

† From 1986Zi08.
‡ The signature has been changed, where necessary, from that given in 1993Ti07 in order to conform to the convention used in the nuclear data sheets.

Adopted Levels, Gammas 1993Ti07

Level Scheme

Intensities: Relative photon branching from each level



$^{16}_{8}O_{8}$

Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Tilley, Weller, Cheves, Chasteler	NP A595,1 (1995)	31-Oct-1994

Q(β^-)=−1655.9 *5*; S(n)=8045; S(p)=15942 *15*; Q(α)=−6228 2012Wa38
Note: Current evaluation has used the following Q record $−1665.50 *638044.39 7815941* 15 1993Au05.

^{18}O Levels

Cross Reference (XREF) Flags

A	^{10}B(^{9}Be,p), ^{11}B(^{9}Be,d)	Q	^{17}O(^{12}C,^{11}C)	AF	^{18}O(^{12}C,^{12}C), (^{13}C,^{13}C)
B	^{12}C(^{7}Li,p)	R	^{18}N β^- decay	AG	^{18}O(^{16}O,^{16}O)
C	^{13}C(^{6}Li,p)	S	^{18}O(γ,n), (γ,2n), (γ,p), (γ,t)	AH	^{18}O(^{17}O,^{17}O), (^{18}O,^{18}O)
D	^{13}C(^{9}Be,α)	T	^{18}O(γ,γ)	AI	^{18}O(^{19}F,^{19}F)
E	^{13}C(^{17}O,^{12}C)	U	^{18}O(e,e)	AJ	^{18}O(^{24}Mg,^{24}Mg), (^{26}Mg,^{26}Mg)
F	^{14}C(α,γ)	V	^{18}O(π,π)	AK	^{18}O(^{27}Al,^{27}Al)
G	^{14}C(α,α), (α,n)	W	^{18}O(n,n)	AL	^{18}O(^{28}Si,^{28}Si)
H	^{14}C(^{6}Li,d)	X	^{18}O(p,p)	AM	^{18}O(^{40}Ca,^{40}Ca), (^{44}Ca,^{44}Ca)
I	^{14}C(^{7}Li,t)	Y	^{18}O(d,d)	AN	^{18}F β^+ decay
J	^{14}C(^{14}C,^{10}Be)	Z	^{18}O(t,t)	AO	^{19}F(γ,p)
K	^{14}C(^{16}O,^{12}C)	Others:		AP	^{19}F(n,d)
L	^{16}O(t,p)	AA	^{18}O(^{3}He,^{3}He)	AQ	^{19}F(p,2p)
M	^{16}O(α,2p)	AB	^{18}O(α,α)	AR	^{19}F(d,^{3}He)
N	^{16}O(^{10}B,^{8}B), (^{13}C,^{11}C)	AC	^{18}O(^{6}Li,^{6}Li), (^{7}Li,^{7}Li)	AS	^{19}F(t,α)
O	^{17}O(d,p)	AD	^{18}O(^{9}Be,^{9}Be)	AT	^{22}Ne(d,^{6}Li)
P	^{17}O(α,^{3}He)	AE	^{18}O(^{10}B,^{10}B), (^{11}B,^{11}B)		

E(level)	J^π	$T_{1/2}$	XREF	Comments
0.0	0^+	stable	BCDEFGHIJKL OPQRSTUVWXYZ	XREF: Others: AA, AB, AC, AD, AE, AF, AG, AH, AI, AJ, AK, AL, AM, AN, AO, AP, AQ, AR, AS, AT T=1
1982.07 *9*	2^+	1.94 ps *5*	ABCDEFGHIJ L NOPQR UVWXY	XREF: Others: AA, AB, AG, AH, AJ, AL, AM, AO, AP, AQ, AR, AS, AT %IT=100 g=−0.287 *15*
3554.84 *40*	4^+	17.2 ps *8*	BC F HI LMNOPQR U X	XREF: Others: AB, AG, AH, AS, AT %IT=100 g=−0.62 *10*
3633.76 *11*	0^+	0.96 ps *11*	BC F HI L O R U X	XREF: Others: AB, AG, AH, AR, AS, AT %IT=100
3920.44 *14*	2^+	18.4 fs *20*	BC F HI L O R U X	XREF: Others: AB, AG, AS %IT=100
4455.54 *10*	1^-	45 fs *10*	BC F HI L O R U X	XREF: Others: AB, AG, AH, AR, AS %IT=100
5097.78 *54*	3^-	43 fs *17*	BC F HI L O R UVWX	XREF: Others: AB, AG, AH, AM, AS, AT %IT=100
5254.8 *9*	2^+	7.0 fs *3*	BC F HI L NO U X	XREF: Others: AB, AR, AS %IT=100
5336.4 *6*	0^+	139 fs *28*	BC H L O U	XREF: Others: AB, AS %IT=100
5377.8 *12*	3^+	<21 fs	BC L OP	XREF: Others: AS %IT=100
5530.24 *29*	2^-	<17 fs	BC L R U X	XREF: Others: AB, AS %IT=100
6198.22 *40*	1^-	2.6 fs *4*	BC H L O R TU	XREF: Others: AB, AS

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{18}O Levels (continued)

E(level)	J^{π}	$T_{1/2}$	XREF	Comments
				%IT=100
6351.3 *6*	(2^-)	<24 fs	BC L O R U	XREF: Others: AB, AS, AT %IT=100
6404.4 *12*	3^-	21 fs *10*	BC L	XREF: Others: AB, AS %IT=100
6880.45 *27*	0^-	<17 fs	BC L R	XREF: Others: AB, AR, AS %IT=100
7116.9 *12*	4^+	<17 fs	BC F HI L NOP U X	XREF: Others: AB, AF, AG, AH, AS %IT=?; %α=?
7615.9 *7*	1^-	<2.5 keV	BC F H L R U	XREF: Others: AB, AF, AG, AH, AS %IT=?; %α=?
7771.07 *50*	2^-	<50 keV	BC L R U	XREF: Others: AS %IT=100
7864 *5*	5^-		BC F HI L OP U	XREF: Others: AB, AF, AG, AH, AS, AT %IT=100
7977 *4*	$(3^+,4^-)$		BC L O	XREF: Others: AS %IT=100
8037.8 *7*	1^-	<2.5 keV	BC FG LMN R U	XREF: Others: AF, AG, AH, AS %IT=?; %α=?
8125 *2*	5^-		BC F HI L U	XREF: Others: AS %IT=?; %α=?
8213 *4*	2^+	1.0 keV *8*	BC FG L U X	XREF: Others: AB, AF, AG, AH, AS %IT=?; %n=?; %α=? T=(1)
8282 *3*	3^-	8 keV *1*	BC FGHI L U	XREF: Others: AB, AS %IT=?; %n=?; %α=?
8410 *8*	(2^-)	8 keV *6*	G L U	XREF: Others: AS %n=?; %α=?
8521 *6*			L U	XREF: Others: AS %IT=100
8660 *6*			L	XREF: Others: AS
8817 *12*	(1^+)	70 keV *12*	G P X	XREF: Others: AB %n=?; %α=?
8955 *4*		43 keV *3*	G L U	XREF: Others: AB %n=?; %α=?
900×10[1]† *20*	(1^-)		R	%α=? Level uncertain.
9030			L O	XREF: Others: AB
9100				XREF: Others: AB
9270† *20*	$(0,1,2)^-$		R	
9361 *6*	(3^-)	27 keV *15*	G I L U	XREF: Others: AB, AF, AG, AH %IT=?; %n=?; %α=?
9414 *18*		≈120 keV	G I L	XREF: Others: AB %n=?; %α=?
9480 *24*		≈65 keV	G L	%n=?; %α=?
9672 *7*	(3^-)	60 keV *30*	G L	XREF: Others: AB, AF, AG, AH %n=?; %α=?
9713 *7*			L U	XREF: Others: AB %IT=100
9890 *11*		≈150 keV	G L	XREF: Others: AB %n=?; %α=?
10118 *10*	3^-	16 keV *4*	GH L	XREF: Others: AB %n=?; %α=?
10240† *20*	$(0,1,2)^-$		R	%n=100
10295 *14*	4^+	<50 keV	GHI LM U	XREF: Others: AB, AF, AG, AH %IT=?; %n=?; %α=?

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{18}O Levels (continued)

E(level)	J^{π}	$T_{1/2}$	XREF	Comments
10396 *9*	3^-		G L	XREF: Others: AB %n=?; %α=?
10430 *40*	(2^-)	<50 keV	U	%IT=100
10595 *15*			G L	%n=?; %α=?
10670 *20*	(2^-)	<50 keV	U	%IT=100
10820 *20*			G	%n=?; %α=?
10910 *20*			G I	%n=?; %α=?
10990 *20*	(2^-)	<50 keV	G U	%IT=?; %n=?; %α=?
11060	(6^-)		P	
11130 *20*			G I	XREF: Others: AR %n=?; %α=?
11390 *20*	(2^+)		GH	%n=?; %α=?
11410 *20*	(4^+)		GH	%n=?; %α=?
11490[†] *30*	$(0,1,2)^-$		R	%n=100
11520 *50*	(2^-)	<50 keV	U	%IT=100
11620 *20*	5^-		GHI U	XREF: Others: AB, AF, AG, AH %n=?; %α=?
11670 *20*	(3^-)	112.00 keV *2*	U	
11690 *20*	6^+		GHI	XREF: Others: AB %n=?; %α=?
11820 *20*	(3^-)		G	%n=?; %α=?
11900 *30*	(2^-)	<50 keV	U	%IT=100
12040 *20*	(2^+)		GH	%IT=?; %n=?; %α=?
12090 *20*	$(1^-,2^+)$	<50 keV	U	
12250 *20*	(1^-)		GH	%n=?; %α=?
12330 *20*	5^-		GHI	%n=?; %α=?
12410 *20*	(3^-)	143 keV *24*	U	%IT=100
12500 *20*	4^+		G	XREF: Others: AF, AG, AH %n=?; %α=?
12520 *20*		<50 keV	U	%IT=100
12530 *20*	6^+		GHI	XREF: Others: AF, AG, AH %n=?; %α=?
12660 *20*	(2^-)	<50 keV	U	%IT=100
12990 *20*	(4^-)	68 keV *18*	U	%IT=100
13100	1^-	700 keV	S	%IT=?; %n=?
13400 *20*	(2^-)	108 keV *20*	U	%IT=100
13800	1^-	600 keV	S	%IT=?; %n=?
13850 *13*	(6^-)	≈200 keV	P U	%IT=100
14170 *40*	(6^-)	140 keV *50*	P U	%IT=100
14450 *50*		≈1070 keV	U	%IT=100
14700	1^-	800 keV	S	%IT=?; %n=?
15230 *40*		≈300 keV	U	%IT=100
15800	1^-	700 keV	S	%IT=?; %n=?
15950 *30*		<50 keV	U	%IT=100
16210 *10*	$1^{(-)}$		U	%IT=100
16315 *10*	$(3,2)^-$		U	%IT=100
16399 *5*	2^-	<20 keV	U X	%IT=100 T=2
16880 *30*	$(4^-,2^-)$	<50 keV	U	%IT=100 T=(1)
16948 *10*	$(3,2)^-$		U	%IT=100
17025 *10*	(3^-)	20 keV *6*	U	%IT=100 T=2
17050	(7^-)	≈350 keV	H	
17398 *10*	1^-	600 keV	S U	%IT=?; %n=?; %p=? T=(2)

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{18}O Levels (continued)

E(level)	J^π	$T_{1/2}$	XREF	Comments
17450 *10*	$(2,1,3)^-$		U	%IT=100
17460 *30*	(4^-)	≈600 keV	U	%IT=100 T=1
17500		≈150 keV	U	%IT=100
17502 *10*	$(1,2,3)^-$		U	%IT=100
1760×10[1] *20*	(8^+)		H	
17635 *10*			U	%IT=100
18049 *10*			U	%IT=100
18200		≈150 keV	U	%IT=100
18450 *20*	(3^-)	75 keV *27*	U	%IT=100 T=(1)
18500		≈4300 keV	U	%IT=100
18700 *20*	(4^-)	<20 keV	U	%IT=100 T=2
18871 *5*	1^+		U	%IT=100 T=2
18927 *10*	$(1,2^+)$		U	%IT=100
18950	(7^-)	≈350 keV	H	
19027 *10*	$(1,3)^-$		U	%IT=100
19150 *10*	$(1^-,2^+,3^-)$		U	%IT=100
19240 *20*	(≥3)	<20 keV	U	%IT=100 T=2
19400	1^-	900 keV	S	%IT=?; %p=? T=(2)
19700		≈200 keV	U	%IT=100
20200		≈180 keV	U	%IT=100
20360 *20*	(4^-)	<20 keV	U	%IT=100 T=2
20860 *20*		97 keV *41*	U	%IT=100
21000	1^-	≈150 keV	S U	%IT=?; %n=?; %p=? T=(1)
21420 *20*	(4^-)	<50 keV	U	%IT=100 T=(2)
22400 *20*	4^-	91 keV *8*	U	%IT=100 T=2
22700	1^-		S	%IT=?; %n=?; %p=?
23100 *20*		49 keV *24*	U	%IT=100
23800	1^-	≈1500 keV	S U	%IT=?; %n=?; %p=? T=(1)
27000	1^-		S	%IT=?; %n=?; %p=? T=(2)
30000			S	%IT=?; %n=?
36000			S	%IT=100

† See ^{18}N β^- decay for disscusion of this level.

$\gamma(^{18}O)$

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	Comments
1982.07	2^+	1982	100	0.0	0^+	E2	B(E2)(W.u.)=3.32 *9*
3554.84	4^+	1573	100	1982.07	2^+	E2	B(E2)(W.u.)=1.19 *6*
3633.76	0^+	1652	99.70 *6*	1982.07	2^+	E2	B(E2)(W.u.)=17 *2*
		3634	0.30 *6*	0.0	0^+		$\Gamma(\pi)/\Gamma$=3.0×10^{-3} *6* (1975So05).
3920.44	2^+	1938	87.6 *7*	1982.07	2^+	M1	B(M1)(W.u.)=0.14 *2*

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

γ(^{18}O) (continued)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	δ	Comments
3920.44	2^+	3920	12.4 *7*	0.0	0^+	E2		B(E2)(W.u.)=1.3 *2* Γ(π)/Γ=0.003 *6*.
4455.54	1^-	535	2.5 *9*	3920.44	2^+	E1		B(E1)(W.u.)=0.0035 *11*
		821	70.4 *17*	3633.76	0^+	E1		B(E1)(W.u.)=0.027 *7*
		2473	27.1 *26*	1982.07	2^+	E1	†	B(E1)(W.u.)=0.00041 *10*
5097.78	3^-	1178	17.6 *7*	3920.44	2^+	E1	†	B(E1)(W.u.)=0.0025 *11*
		1543	6.3 *8*	3554.84	4^+	E1	†	B(E1)(W.u.)=0.00036 *15*
		3116	76.1 *8*	1982.07	2^+	E1	†	B(E1)(W.u.)=0.00057 *23*
5254.8	2^+	799	3.0 *3*	4455.54	1^-	E1		B(E1)(W.u.)=0.0082 *8*
		1334	8.7 *4*	3920.44	2^+	M1		B(M1)(W.u.)=0.111 *8*
		1621	1.0 *6*	3633.76	0^+	E2		B(E2)(W.u.)=23 *15*
		1699	1.1 *6*	3554.84	4^+	E2		B(E2)(W.u.)=21 *12*
		3272	55.9 *10*	1982.07	2^+	M1+E2	0.15 *4*	
		5254	30.3 *9*	0.0	0^+	E2	†	B(E2)(W.u.)=2.15 *11*
5336.4	0^+	880	42 *2*	4455.54	1^-	E1		B(E1)(W.u.)=0.0042 *9*
		3354	58 *2*	1982.07	2^+	E2		B(E2)(W.u.)=2.0 *4*
		5336		0.0	0^+			Γ(π)/Γ≤0.0023.
5377.8	3^+	1459	13.5 *22*	3920.44	2^+		†	
		3396	86.5 *22*	1982.07	2^+		†	
5530.24	2^-	1074	27 *2*	4455.54	1^-		†	
		1610	24 *2*	3920.44	2^+			
		3548	49 *2*	1982.07	2^+		†	
6198.22	1^-	862	1.1 *3*	5336.4	0^+	E1		B(E1)(W.u.)=0.0064 *20*
		943	3.6 *4*	5254.8	2^+	E1		B(E1)(W.u.)=0.016 *3*
		1742	4.1 *4*	4455.54	1^-	M1		B(M1)(W.u.)=0.063 *13*
		2564	2.5 *3*	3633.76	0^+	E1		B(E1)(W.u.)=0.00055 *12*
		6198	88.7 *9*	0.0	0^+	E1		B(E1)(W.u.)=0.0014 *3*
6351.3	(2^-)	1895	12 *2*	4455.54	1^-		†	
		2431	55 *2*	3920.44	2^+		†	
		4369	32 *2*	1982.07	2^+		†	
6404.4	3^-	1149	5.6 *9*	5254.8	2^+	E1		B(E1)(W.u.)=0.0017 *9*
		1306	9.8 *9*	5097.78	3^-	M1		B(M1)(W.u.)=0.045 *26*
		1948	2.8 *10*	4455.54	1^-	E2		B(E2)(W.u.)=9 *6*
		2484	6.3 *10*	3920.44	2^+	E1	†	B(E1)(W.u.)=0.00020 *11*
		2849	7.4 *12*	3554.84	4^+	E1		B(E1)(W.u.)=0.00015 *8*
		4422	68.1 *18*	1982.07	2^+	E1	†	B(E1)(W.u.)=0.00037 *20*
6880.45	0^-	2424	100	4455.54	1^-		†	
7116.9	4^+	1857	0.30 *6*	5254.8	2^+			
		2019	1.3 *2*	5097.78	3^-	E1		B(E1)(W.u.)=0.00029 *8*
		3197	2.1 *2*	3920.44	2^+	E2		B(E2)(W.u.)=2.2 *6*
		3562	69.2 *7*	3554.84	4^+	M1		B(M1)(W.u.)=0.071 *16* $\Gamma_\gamma/\Gamma\alpha$=0.9 *1*.
		5135	27.1 *4*	1982.07	2^+	E2+(M3)	−0.052 *35*	B(E2)(W.u.)=3.2 *6*
7615.9	1^-	1418	1 *1*	6198.22	1^-	M1		B(M1)(W.u.)=0.07 *7*
		2280	6 *1*	5336.4	0^+	E1		B(E1)(W.u.)=0.0045 *13*
		3160	8 *1*	4455.54	1^-	M1+E2	−0.027 *8*	
		5634	62 *3*	1982.07	2^+	E1+M2	−0.21 *3*	
		7616	23 *2*	0.0	0^+	E1		B(E1)(W.u.)=0.00046 *11*
7771.07	2^-	2673	36 *3*	5097.78	3^-			
		3315	11 *2*	4455.54	1^-			
		5789	53 *3*	1982.07	2^+			
7864	5^-	4309	>75	3554.84	4^+	E1		B(E1)(W.u.)>0.0009

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

γ(^{18}O) (continued)

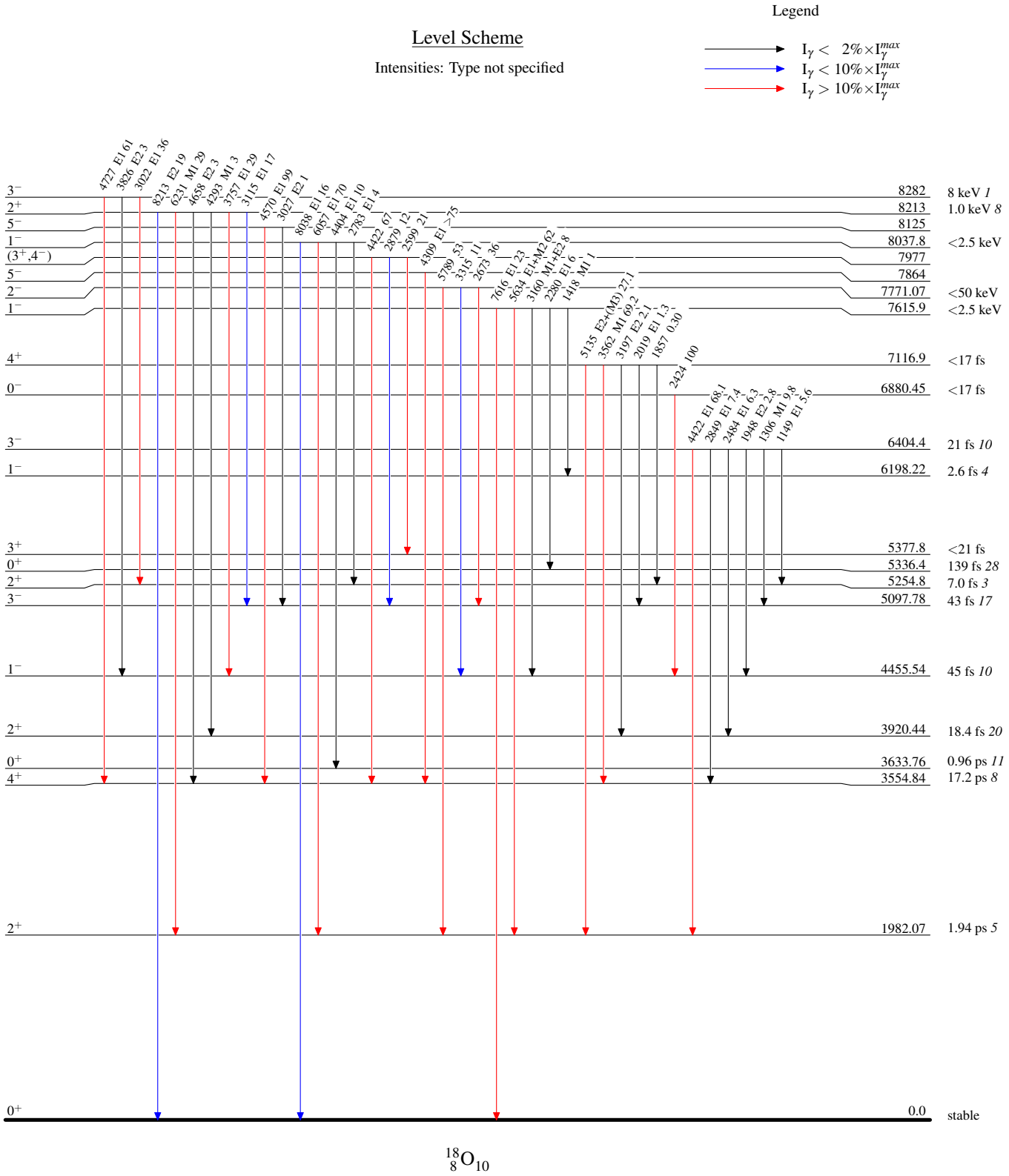
E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	Comments
7977	$(3^+,4^-)$	2599	21 *2*	5377.8	3^+		
		2879	12 *2*	5097.78	3^-		
		4422	67 *2*	3554.84	4^+		
8037.8	1^-	2783	4 *1*	5254.8	2^+	E1	B(E1)(W.u.)=0.0043 *14*
		4404	10 *1*	3633.76	0^+	E1	B(E1)(W.u.)=0.00028 *8*
		6057	70 *2*	1982.07	2^+	E1	B(E1)↓=0.0072 *15* $\Gamma\alpha\ \Gamma_\gamma/\Gamma$=0.89 eV.
		8038	16 *1*	0.0	0^+	E1	B(E1)(W.u.)=0.00070 *17*
8125	5^-	3027	1 *1*	5097.78	3^-	E2	B(E2)(W.u.)=5 *5*
		4570	99 *1*	3554.84	4^+	E1	B(E1)(W.u.)=0.0061 *11* $\Gamma\alpha\ \Gamma_\gamma/\Gamma$=0.22 eV.
8213	2^+	3115	17 *1*	5097.78	3^-	E1	B(E1)(W.u.)=0.0050 *11*
		3757	29 *3*	4455.54	1^-	E1	B(E1)(W.u.)=0.0049 *16*
		4293	3 *1*	3920.44	2^+	M1	B(M1)(W.u.)=0.0072 *30*
		4658	3 *1*	3554.84	4^+	E2	B(E2)(W.u.)=2.4 *10*
		6231	29 *3*	1982.07	2^+	M1	B(M1)(W.u.)=0.024 *8*
		8213	19 *4*	0.0	0^+	E2	B(E2)(W.u.)=0.9 *3*
8282	3^-	3022	36 *3*	5254.8	2^+	E1	B(E1)(W.u.)=0.014 *5*
		3826	3 *3*	4455.54	1^-	E2	B(E2)(W.u.)=8 *8*
		4727	61 *3*	3554.84	4^+	E1	B(E1)(W.u.)=0.0061 *16*

† δ is consistent with 0.

Adopted Levels, Gammas

Level Scheme

Intensities: Type not specified

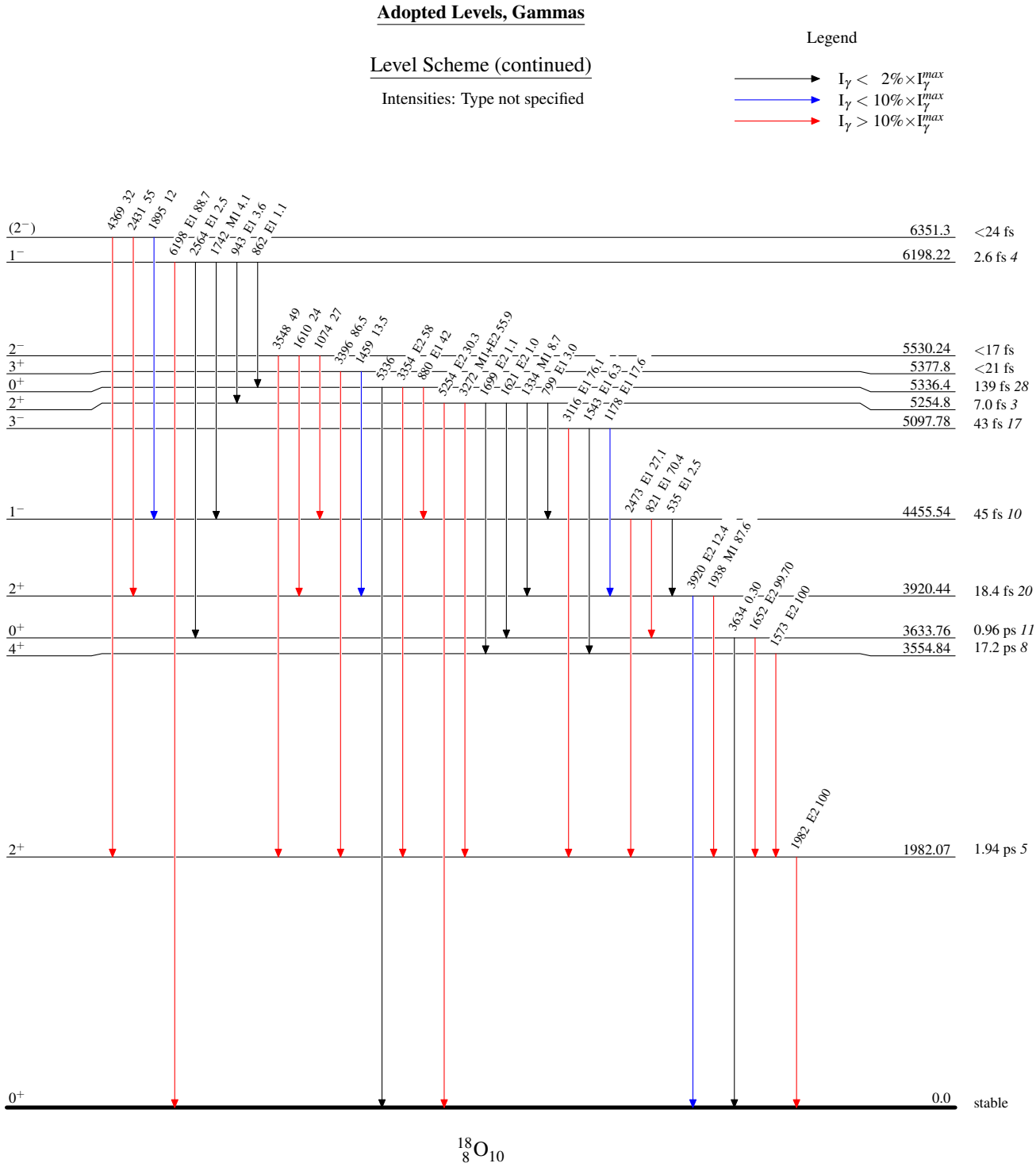


$^{18}_{8}O_{10}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified



$^{18}_{8}O_{10}$

Adopted Levels, Gammas 1998Ti06

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	D. R. Tilley, C. Cheves, J. Kelley, S. Raman, H. Weller	NP A636,249 (1998)	21-Apr-1997

Q(β^-)=3813.6 *9*; S(n)=7608 *3*; S(p)=19348 *17*; Q(α)=−12323 *4* 2012Wa38
Note: Current evaluation has used the following Q record 3814.3 21 *7608* 3 *19352* 16-12322 *4* 1997Au04.
See other reaction references in 1998Ti06.

^{20}O Levels

Cross Reference (XREF) Flags

A ^{18}O(t,p)
B ^{18}O(α,2p)
C ^{18}O(^{18}O,^{16}O)

E(level)	J$^\pi$	T$_{1/2}$	XREF	Comments
0.0	0$^+$	13.51 s *5*	ABC	%β^-=100 T=2 T$_{1/2}$: Weighted average: 13.49 s *5* (1974Al09) 13.57 s *1* (1970Ma42).
1673.68 *15*	2$^+$	7.3 ps *3*	ABC	μ=−0.70 *3* (1989Ra17) Γ_γ=6.28×10^{-5} eV *24*.
3570 *7*	4$^+$		ABC	
4072 *4*	2$^+$		A C	
4456 *5*	0$^+$		A C	
4850 *15*	4$^+$		A	
5002 *6*			A	
5234 *5*	2$^+$		A	
5304 *6*	2$^+$		A	
5387 *6*	0$^+$		A	
5614 *3*	(3$^-$)		A	
6555 *8*	(2)		A	
7252 *8*	5$^-$		A	
7622† *7*	3$^-$ & 4$^+$		A	
7754† *5*	4$^+$		AB	
7855† *6*	(5$^-$)		AB	
8554† *8*	4$^+$		A	
8804† *9*	3$^-$		AB	
8962† *21*	(0$^+$)		A	
9770† *8*	0$^+$		A	
10125† *11*	2$^+$		AB	

† Decay mode not specified.

Adopted Levels, Gammas 1998Ti06 (continued)

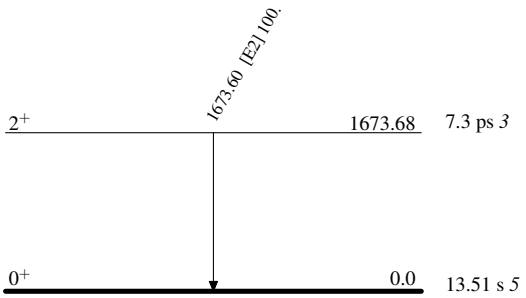
$\gamma(^{20}O)$

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	Comments
1673.68	2^+	1673.60 *15*	100.	0.0	0^+	[E2]	B(E2)(W.u.)=1.80 *7*

Adopted Levels, Gammas 1998Ti06

Level Scheme

Intensities: Type not specified



$^{20}_{8}O_{12}$