Adopted Levels, Gammas

History

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

$Q(\beta^-)=-1655.9$ *5*; $S(n)=8045$; $S(p)=15942$ *15*; $Q(\alpha)=-6228$ 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	$^{10}B(^9Be,p)$, $^{11}B(^9Be,d)$	Q	$^{17}O(^{12}C,^{11}C)$	AF	$^{18}O(^{12}C,^{12}C)$, $(^{13}C,^{13}C)$
B	$^{12}C(^7Li,p)$	R	$^{18}N\ \beta^-$ decay	AG	$^{18}O(^{16}O,^{16}O)$
C	$^{13}C(^6Li,p)$	S	$^{18}O(\gamma,n)$, $(\gamma,2n)$, (γ,p), (γ,t)	AH	$^{18}O(^{17}O,^{17}O)$, $(^{18}O,^{18}O)$
D	$^{13}C(^9Be,\alpha)$	T	$^{18}O(\gamma,\gamma)$	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	$^{14}C(\alpha,\gamma)$	V	$^{18}O(\pi,\pi)$	AK	$^{18}O(^{27}Al,^{27}Al)$
G	$^{14}C(\alpha,\alpha)$, (α,n)	W	$^{18}O(n,n)$	AL	$^{18}O(^{28}Si,^{28}Si)$
H	$^{14}C(^6Li,d)$	X	$^{18}O(p,p)$	AM	$^{18}O(^{40}Ca,^{40}Ca)$, $(^{44}Ca,^{44}Ca)$
I	$^{14}C(^7Li,t)$	Y	$^{18}O(d,d)$	AN	$^{18}F\ \beta^+$ decay
J	$^{14}C(^{14}C,^{10}Be)$	Z	$^{18}O(t,t)$	AO	$^{19}F(\gamma,p)$
K	$^{14}C(^{16}O,^{12}C)$		Others:	AP	$^{19}F(n,d)$
L	$^{16}O(t,p)$	AA	$^{18}O(^3He,^3He)$	AQ	$^{19}F(p,2p)$
M	$^{16}O(\alpha,2p)$	AB	$^{18}O(\alpha,\alpha)$	AR	$^{19}F(d,^3He)$
N	$^{16}O(^{10}B,^8B)$, $(^{13}C,^{11}C)$	AC	$^{18}O(^6Li,^6Li)$, $(^7Li,^7Li)$	AS	$^{19}F(t,\alpha)$
O	$^{17}O(d,p)$	AD	$^{18}O(^9Be,^9Be)$	AT	$^{22}Ne(d,^6Li)$
P	$^{17}O(\alpha,^3He)$	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

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Adopted Levels, Gammas (continued)

^{18}O Levels (continued)

E(level)	J^π	$T_{1/2}$	XREF	Comments
6351.3 6	(2⁻)	<24 fs	BC L O R U	%IT=100 XREF: Others: AB, AS, AT
6404.4 12	3⁻	21 fs 10	BC L	%IT=100 XREF: Others: AB, AS
6880.45 27	0⁻	<17 fs	BC L R	%IT=100 XREF: Others: AB, AR, AS
7116.9 12	4⁺	<17 fs	BC F HI L NOP U X	%IT=100 XREF: Others: AB, AF, AG, AH, AS
7615.9 7	1⁻	<2.5 keV	BC F H L R U	%IT=?; %α=? XREF: Others: AB, AF, AG, AH, AS
7771.07 50	2⁻	<50 keV	BC L R U	%IT=?; %α=? XREF: Others: AS
7864 5	5⁻		BC F HI L OP U	%IT=100 XREF: Others: AB, AF, AG, AH, AS, AT
7977 4	(3⁺,4⁻)		BC L O	%IT=100 XREF: Others: AS
8037.8 7	1⁻	<2.5 keV	BC FG LMN R U	%IT=100 XREF: Others: AF, AG, AH, AS
8125 2	5⁻		BC F HI L U	%IT=?; %α=? XREF: Others: AS
8213 4	2⁺	1.0 keV 8	BC FG L U X	%IT=?; %n=?; %α=? T=(1) XREF: Others: AB, AF, AG, AH, AS
8282 3	3⁻	8 keV 1	BC FGHI L U	%IT=?; %n=?; %α=? XREF: Others: AB, AS
8410 8	(2⁻)	8 keV 6	G L U	%n=?; %α=? XREF: Others: AS
8521 6			L U	%IT=100 XREF: Others: AS
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=?

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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)

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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*

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Adopted Levels, Gammas (continued)

$\gamma(^{18}O)$ (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
								$\Gamma(\pi)/\Gamma$=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^+			$\Gamma(\pi)/\Gamma\leq$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

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Adopted Levels, Gammas (continued)

$\gamma(^{18}O)$ (continued)

E_i(level)	J^{π}_i	E_γ	I_γ	E_f	J^{π}_f	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*
							$\Gamma\alpha$ Γ_γ/Γ=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*
							$\Gamma\alpha$ Γ_γ/Γ=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*

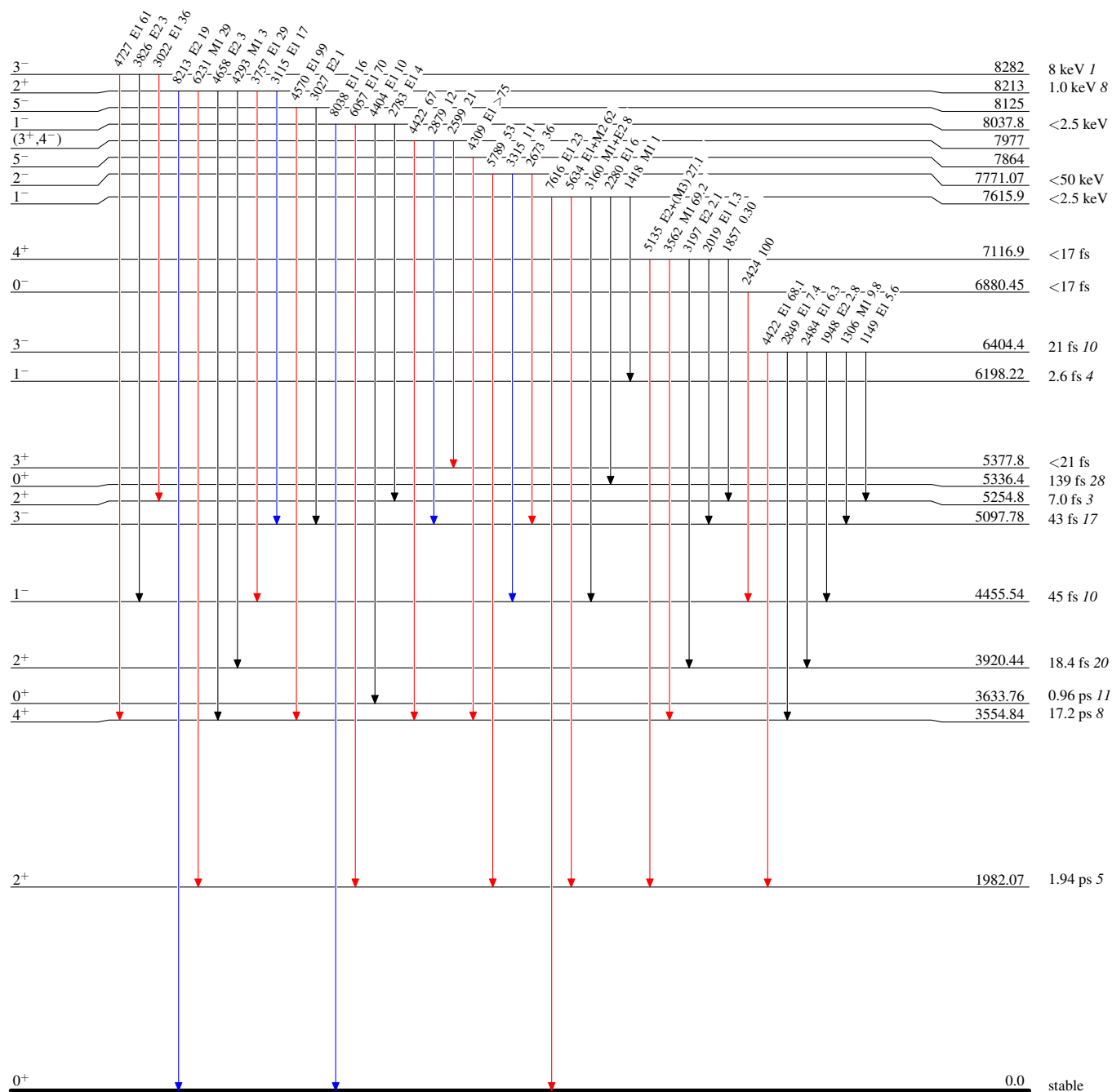† δ is consistent with 0.

From ENSDF

Adopted Levels, Gammas

<u>Level Scheme</u>

Intensities: Type not specified

Legend

$I_\gamma < 2\% \times I_\gamma^{max}$

$I_\gamma < 10\% \times I_\gamma^{max}$

$I_\gamma > 10\% \times I_\gamma^{max}$

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

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

Legend

$I_\gamma < 2\% \times I_\gamma^{max}$

$I_\gamma < 10\% \times I_\gamma^{max}$

$I_\gamma > 10\% \times I_\gamma^{max}$

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