

Adopted Levels, Gammas

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	J. K. Tuli, E. Browne		NDS 157, 260 (2019)	1-Mar-2019

Q( $\beta^-$ )=-4433 13; S(n)=10423 8; S(p)=3825 6; Q( $\alpha$ )=-3554 7 2017Wa10

All data are from (HI,xn $\gamma$ ).

Theory, Calculations:

2016Da01: SD band-head spin (VMI).

2015A119: Yield in <sup>136</sup>Xe-induced reaction on d.

2001Zh16, 2000Ga55 (Signature Inversion).

2000Mb05, 1997Da16 (SD band).

2000Ku28 (Residual (n-p) interaction energy).

<sup>82</sup>Y Levels

Cross Reference (XREF) Flags

- A <sup>82</sup>Zr  $\epsilon$  decay
- B (HI,xn $\gamma$ )

E(level)	J $\pi$ &	T <sub>1/2</sub> <sup>†</sup>	XREF	Comments
0	1 <sup>+</sup>	8.30 s 20	AB	% $\epsilon$ +% $\beta^+$ =100 J $\pi$ : log ft=5.1 to 0 <sup>+</sup> <sup>82</sup> Sr. Configuration=(( $\pi$ (422)5/2 <sup>+</sup> )( $\nu$ (413)7/2 <sup>+</sup> )) or ( $\pi$ [301]3/2 <sup>-</sup> )( $\nu$ [301]1/2 <sup>-</sup> ). T <sub>1/2</sub> : from 1998Oi02; others: 9.5 s 4 (1981Li12,1981HaYZ) and 9.5 s 5 (1982De36).
142.34 7	2 <sup>+</sup> <sup>a</sup>		B	
250.19 9	2 <sup>+</sup> <sup>a</sup>		B	
313.69 8	3 <sup>+</sup> <sup>a</sup>		B	
336.99 10	3 <sup>+</sup> <sup>a</sup>		B	
401.10 10	4 <sup>+</sup> <sup>a</sup>	11 <sup>#</sup> ns 3	B	T <sub>1/2</sub> : others: 11 ns 2 (1995Pa23), 20 ns 10 (1994Mu02).
402.63 <sup>f</sup> 14	4 <sup>-</sup> <sup>a</sup>	268 <sup>#</sup> ns 25	B	T <sub>1/2</sub> : other: 220 ns 50 (1994Mu02).
405.76 <sup>g</sup> 24	4 <sup>-</sup> <sup>a</sup>	35.3 <sup>#</sup> ns 21	B	
473.83 <sup>g</sup> 17	(5 <sup>-</sup> ) <sup>b</sup>		B	
507.50 <sup>d</sup> 13	6 <sup>+</sup>	147 <sup>#</sup> ns 7	B	T <sub>1/2</sub> : others: 157 ns 14 (1995Pa23), 137 ns 20 (1994Mu02).
511.82 <sup>e</sup> 15	(5 <sup>-</sup> )	1.42 <sup>‡</sup> ns 14	B	
586.58 <sup>g</sup> 16	(6 <sup>-</sup> ) <sup>b</sup>		B	
594.71? 14	(6 <sup>+</sup> ) <sup>b</sup>		B	
677.92 <sup>f</sup> 15	6 <sup>-</sup>	0.43 <sup>‡</sup> ns 3	B	
718.84 <sup>c</sup> 15	7 <sup>+</sup>	23 <sup>‡</sup> ps 10	B	
751.47 <sup>d</sup> 15	8 <sup>+</sup>	0.83 <sup>‡</sup> ns 4	B	T <sub>1/2</sub> : other: 3.67 ns 14 (1995Pa23).
818.20 <sup>h</sup> 19	(6 <sup>-</sup> ) <sup>b</sup>		B	
956.91 <sup>e</sup> 16	(7 <sup>-</sup> )	8 <sup>‡</sup> ps 4	B	T <sub>1/2</sub> : other: 0.43 ns 8 (1995Pa23).
1146.92 <sup>c</sup> 16	9 <sup>+</sup>	1.04 <sup>@</sup> ps 7	B	
1163.35 <sup>g</sup> 20	(7 <sup>-</sup> )		B	
1272.21 <sup>f</sup> 16	8 <sup>-</sup>	8 <sup>‡</sup> ps 4	B	
1284.10? 18	(8 <sup>+</sup> ) <sup>b</sup>		B	
1506.7 <sup>h</sup> 4	(8 <sup>-</sup> )		B	
1589.71 <sup>d</sup> 17	10 <sup>+</sup>	0.97 <sup>@</sup> ps 7	B	
1687.71 <sup>e</sup> 18	(9 <sup>-</sup> )	1.5 <sup>@</sup> ps 5	B	
1960.03 <sup>c</sup> 17	11 <sup>+</sup>	0.42 ps 10	B	T <sub>1/2</sub> : other: 0.49 ps 4 (1995Pa23).

Continued on next page (footnotes at end of table)

**Adopted Levels, Gammas (continued)**

<sup>82</sup>Y Levels (continued)

E(level)	J <sup>π&amp;</sup>	T <sub>1/2</sub> <sup>†</sup>	XREF	Comments
1963.7 <sup>g</sup> 4	(9 <sup>-</sup> )		B	
2061.49 <sup>f</sup> 18	10 <sup>-</sup>	0.65 <sup>@</sup> ps 15	B	
2379.0 <sup>h</sup> 6	(10 <sup>-</sup> )		B	
2602.13 <sup>e</sup> 20	(11 <sup>-</sup> )	0.31 ps 5	B	T <sub>1/2</sub> : other: 0.69 ps 14 (1995Pa23).
2651.20 <sup>d</sup> 19	12 <sup>+</sup>	0.28 ps 4	B	T <sub>1/2</sub> : other: 0.49 ps 12 (1995Pa23).
2914.7 <sup>g</sup> 11	(11 <sup>-</sup> )		B	
2970.8 <sup>c</sup> 3	13 <sup>+</sup>	0.24 ps 3	B	T <sub>1/2</sub> : other: 0.31 ps 8 (1995Pa23).
3026.0 <sup>f</sup> 4	12 <sup>-</sup>	0.49 <sup>@</sup> ps 12	B	
3386.0 <sup>h</sup> 12	(12 <sup>-</sup> )		B	
3674.94 <sup>e</sup> 23	(13 <sup>-</sup> )	0.166 ps 21	B	T <sub>1/2</sub> : other: 0.35 ps 8 (1995Pa23).
3904.02 <sup>d</sup> 22	14 <sup>+</sup>	0.24 <sup>@</sup> ps 6	B	
3934.7 <sup>g</sup> 15	(13 <sup>-</sup> )		B	
4142.6 <sup>c</sup> 3	15 <sup>+</sup>	0.132 ps 14	B	T <sub>1/2</sub> : other: 0.14 ps 5 (1995Pa23).
4150.0 <sup>f</sup> 4	14 <sup>-</sup>	0.24 <sup>@</sup> ps 6	B	
4413.0 <sup>h</sup> 16	(14 <sup>-</sup> )		B	
4885.9 <sup>e</sup> 4	(15 <sup>-</sup> )	<0.26 ps	B	T <sub>1/2</sub> : other: 0.21 ps 7 (1995Pa23).
5043.7 <sup>g</sup> 18	(15 <sup>-</sup> )		B	
5250.0 <sup>d</sup> 3	16 <sup>+</sup>		B	
5414.4 <sup>f</sup> 4	16 <sup>-</sup>		B	
5456.2 <sup>c</sup> 4	17 <sup>+</sup>	0.083 ps 14	B	T <sub>1/2</sub> : other: 0.09 ps 4 (1995Pa23).
6222.7 <sup>e</sup> 5	(17 <sup>-</sup> )		B	
6672.1 <sup>d</sup> 5	18 <sup>+</sup>		B	
6777.2 <sup>f</sup> 5	(18 <sup>-</sup> )		B	
6914.4 <sup>c</sup> 5	19 <sup>+</sup>	<0.21 ps	B	
7591.2 <sup>e</sup> 10	(19 <sup>-</sup> )		B	
8187.6 <sup>f</sup> 6	(20 <sup>-</sup> )		B	
8194.2 <sup>d</sup> 6	20 <sup>+</sup>		B	
8515.7 <sup>c</sup> 6	21 <sup>+</sup>		B	
8602.2 12	(19 <sup>+</sup> ,20 <sup>+</sup> )		B	J <sup>π</sup> : 1930γ is not an E1 (1995Pa23).
9679.9 <sup>f</sup> 10	(22 <sup>-</sup> )		B	
9861.0 <sup>d</sup> 7	22 <sup>+</sup>		B	
10267.1 <sup>c</sup> 7	(23 <sup>+</sup> )		B	
11712.8 <sup>d</sup> 11	(24 <sup>+</sup> )		B	
12080.1 <sup>c</sup> 12	(25 <sup>+</sup> )		B	
13785.5 <sup>d</sup> 12	(26 <sup>+</sup> )		B	
14032.3 <sup>c</sup> 13	(27 <sup>+</sup> )		B	
x <sup>i</sup>	J		B	J <sup>π</sup> : ≈(16) suggested by 2003Le08; (17) VIM (2016Da01). Other: ≈(20) (1995Da30). Additional information 1.
1454.0+x <sup>i</sup> 10	J+2		B	
3059.0+x <sup>i</sup> 15	J+4		B	
4833.0+x <sup>i</sup> 18	J+6		B	
6769.1+x <sup>i</sup> 20	J+8		B	
8869.1+x <sup>i</sup> 23	J+10		B	
11133.1+x <sup>i</sup> 25	J+12		B	
13560+x <sup>i</sup> 3	J+14		B	
16142+x <sup>i</sup> 3	J+16		B	
18897+x <sup>i</sup> ? 4	J+18		B	

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued) $^{82}\text{Y}$  Levels (continued)

† From 1993Wo04 DSAM, unless indicated otherwise.

‡ From 1996Jo05 recoil-distance.

# By direct timing (1993Wo04).

@ From 1995Pa23.

&  $J^\pi$  for levels belonging to bands are from band assignments and expected configurations for the bandheads (1994Mu02,1993Wo04).

<sup>a</sup> Deduced from decay patterns and measured lifetime values or limits (1993Wo04). The assignments agree with those of 1994Mu02 which are based on  $\gamma(\theta)$ , lifetimes, and conversion coefficients derived from  $\gamma$  intensity balance.

<sup>b</sup> Tentative assignment from systematics (1993Wo04).

<sup>c</sup> Band(A):  $(\pi,\alpha)=(+,1)$ . Configuration= $((\pi g_{9/2})(\nu g_{9/2}))$ .

<sup>d</sup> Band(B):  $(\pi,\alpha)=(+,0)$ . Configuration= $((\pi g_{9/2})(\nu g_{9/2}))$ .

<sup>e</sup> Band(C):  $(\pi,\alpha)=(-,1)$ . Main component has configuration= $((\pi g_{9/2})(\nu f_{5/2}))$ .

<sup>f</sup> Band(D):  $(\pi,\alpha)=(-,0)$ . Main component has configuration= $((\pi g_{9/2})(\nu f_{5/2}))$ .

<sup>g</sup> Band(E):  $\pi=-$ . From 1993Wo04, 1995Pa23, not In 1994Mu02.

<sup>h</sup> Band(F):  $\pi=-$ . From 1993Wo04, 1995Pa23, not In 1994Mu02.

<sup>i</sup> Band(G): SD band,  $(\pi,\alpha)=(-,0)$  (1995Da30,2003Le08). Percent population of SD band=0.93 (2003Le08), 1.5 5 (1995Da30).  $Q(\text{intrinsic})=4.3 + 18-8$  (2003Le08).  $\beta_2 \approx 0.55$  (1995Da30). Configuration= $(\pi 5^1(1/2[431])^2)(\nu 5^2(5/2[422])^{-1})$  (1995Da30);  $\nu 5^1 \pi 5^0$  or  $\nu 5^1 \pi 5^1$  (2003Le08).

Adopted Levels, Gammas (continued) $\gamma(^{82}\text{Y})$ 

All data are from (HI,xny).

$E_i(\text{level})$	$J_i^\pi$	$E_\gamma$	$I_\gamma$	$E_f$	$J_f^\pi$	Mult.	$\alpha^\dagger$	Comments
142.34	2 <sup>+</sup>	142.3 1	100	0	1 <sup>+</sup>	D		
250.19	2 <sup>+</sup>	107.9 2	29 5	142.34	2 <sup>+</sup>			
		250.2 1	100 8	0	1 <sup>+</sup>	D		
313.69	3 <sup>+</sup>	63.7 3	46 19	250.19	2 <sup>+</sup>			
		171.4 1	100 4	142.34	2 <sup>+</sup>	D		
		313.7 1	86 7	0	1 <sup>+</sup>	Q		
336.99	3 <sup>+</sup>	194.6 1	100 4	142.34	2 <sup>+</sup>	D		
		337.1 2	49 7	0	1 <sup>+</sup>	Q		
401.10	4 <sup>+</sup>	64.3 3	31 17	336.99	3 <sup>+</sup>			
		87.5 1	100 4	313.69	3 <sup>+</sup>			
		258.7 1	≈6.522	142.34	2 <sup>+</sup>			
402.63	4 <sup>-</sup>	65.7 2	100 10	336.99	3 <sup>+</sup>	[E1]	0.367	$\alpha(\text{K})=0.323$ 6; $\alpha(\text{L})=0.0369$ 7; $\alpha(\text{M})=0.00623$ 11 $\alpha(\text{N})=0.000812$ 14; $\alpha(\text{O})=4.88\times 10^{-5}$ 8 $\text{B}(\text{E}1)(\text{W.u.})=2.1\times 10^{-6}$ 4
		88.9 2	75 6	313.69	3 <sup>+</sup>	[E1]	0.1518 24	$\alpha(\text{K})=0.1339$ 21; $\alpha(\text{L})=0.01505$ 24; $\alpha(\text{M})=0.00255$ 4 $\alpha(\text{N})=0.000335$ 6; $\alpha(\text{O})=2.09\times 10^{-5}$ 4 $\text{B}(\text{E}1)(\text{W.u.})=6.4\times 10^{-7}$ 9
405.76	4 <sup>-</sup>	68.2 3	100	336.99	3 <sup>+</sup>	[E1]	0.329 7	$\alpha(\text{K})=0.290$ 6; $\alpha(\text{L})=0.0330$ 7; $\alpha(\text{M})=0.00558$ 11 $\alpha(\text{N})=0.000728$ 14; $\alpha(\text{O})=4.40\times 10^{-5}$ 9 $\text{B}(\text{E}1)(\text{W.u.})=2.41\times 10^{-5}$ 15
473.83	(5 <sup>-</sup> )	67.5 3	100	405.76	4 <sup>-</sup>			
507.50	6 <sup>+</sup>	106.4 1	100	401.10	4 <sup>+</sup>	E2	0.849	$\alpha(\text{K})=0.710$ 11; $\alpha(\text{L})=0.1162$ 17; $\alpha(\text{M})=0.0200$ 3 $\alpha(\text{N})=0.00249$ 4; $\alpha(\text{O})=0.0001063$ 16 $\text{B}(\text{E}2)(\text{W.u.})=7.2$ 4
511.82	(5 <sup>-</sup> )	109.2 1	100	402.63	4 <sup>-</sup>	(D)		
586.58	(6 <sup>-</sup> )	74.2 2	100 4	511.82	(5 <sup>-</sup> )			
		112.4 2	43 3	473.83	(5 <sup>-</sup> )			
594.71?	(6 <sup>+</sup> )	193.7 <sup>‡</sup> 1	100	401.10	4 <sup>+</sup>			
677.92	6 <sup>-</sup>	91.1 1		586.58	(6 <sup>-</sup> )			
		166.5 2	100 3	511.82	(5 <sup>-</sup> )	D		
		170.7 2	81 3	507.50	6 <sup>+</sup>	[E1]	0.0225	$\alpha(\text{K})=0.0199$ 3; $\alpha(\text{L})=0.00219$ 4; $\alpha(\text{M})=0.000373$ 6 $\alpha(\text{N})=4.95\times 10^{-5}$ 8; $\alpha(\text{O})=3.26\times 10^{-6}$ 5 $\text{B}(\text{E}1)(\text{W.u.})=5.9\times 10^{-5}$ 5
		204.1 1		473.83	(5 <sup>-</sup> )			
		276.1 5	45.4 21	401.10	4 <sup>+</sup>	(E2)	0.0272	$\alpha(\text{K})=0.0237$ 4; $\alpha(\text{L})=0.00292$ 5; $\alpha(\text{M})=0.000500$ 8 $\alpha(\text{N})=6.54\times 10^{-5}$ 10; $\alpha(\text{O})=3.92\times 10^{-6}$ 6 $\text{B}(\text{E}2)(\text{W.u.})=7.7$ 7 Mult.: (Q) but M2 unlikely from RUL.

Adopted Levels, Gammas (continued) $\gamma(^{82}\text{Y})$  (continued)

$E_i(\text{level})$	$J_i^\pi$	$E_\gamma$	$I_\gamma$	$E_f$	$J_f^\pi$	Mult.	$\alpha^\dagger$	Comments
718.84	7 <sup>+</sup>	211.3 1	100	507.50	6 <sup>+</sup>	D		
751.47	8 <sup>+</sup>	32.6 3 243.9 1	18 5 100.0	718.84 507.50	7 <sup>+</sup> 6 <sup>+</sup>	E2	0.0420	$\alpha(\text{K})=0.0365$ 6; $\alpha(\text{L})=0.00459$ 7; $\alpha(\text{M})=0.000785$ 11 $\alpha(\text{N})=0.0001023$ 15; $\alpha(\text{O})=5.98\times 10^{-6}$ 9 B(E2)(W.u.)=30.5 20 Mult.: Q but M2 unlikely from RUL.
818.20	(6 <sup>-</sup> )	140.0 2 306.6 2 344.5 3	79 4 51 4 100 5	677.92 511.82 473.83	6 <sup>-</sup> (5 <sup>-</sup> ) (5 <sup>-</sup> )			
956.91	(7 <sup>-</sup> )	238.1 2	13.4 14	718.84	7 <sup>+</sup>	[E1]	0.00865	$\alpha(\text{K})=0.00765$ 11; $\alpha(\text{L})=0.000841$ 12; $\alpha(\text{M})=0.0001430$ 21 $\alpha(\text{N})=1.91\times 10^{-5}$ 3; $\alpha(\text{O})=1.279\times 10^{-6}$ 19 B(E1)(W.u.)=0.00022 12
		278.2 6 370.3 2 445.1 3	27.5 17 31.6 17 100 3	677.92 586.58 511.82	6 <sup>-</sup> (6 <sup>-</sup> ) (5 <sup>-</sup> )	(D) E2	0.00561	$\alpha(\text{K})=0.00492$ 7; $\alpha(\text{L})=0.000573$ 9; $\alpha(\text{M})=9.78\times 10^{-5}$ 14 $\alpha(\text{N})=1.296\times 10^{-5}$ 19; $\alpha(\text{O})=8.38\times 10^{-7}$ 12 B(E2)(W.u.)=9.E+1 5 Mult.: Q, E2 from $\Delta\text{J}$ .
1146.92	9 <sup>+</sup>	449.6 3 395.5 1	28.4 17 100.0 11	507.50 751.47	6 <sup>+</sup> 8 <sup>+</sup>	D		
1163.35	(7 <sup>-</sup> )	428.0 2 345 1 576.8 2	3.3 5 32 6 98 5	718.84 818.20 586.58	7 <sup>+</sup> (6 <sup>-</sup> ) (6 <sup>-</sup> )			
1272.21	8 <sup>-</sup>	651.5 2 315.3 2 521 1 553 1 594.3 1	100 5 26.7 25 5.2 14 7.3 21 100.0 11	511.82 956.91 751.47 718.84 677.92	(5 <sup>-</sup> ) (7 <sup>-</sup> ) 8 <sup>+</sup> 7 <sup>+</sup> 6 <sup>-</sup>	E2	0.00237	$\alpha(\text{K})=0.00209$ 3; $\alpha(\text{L})=0.000237$ 4; $\alpha(\text{M})=4.05\times 10^{-5}$ 6 $\alpha(\text{N})=5.39\times 10^{-6}$ 8; $\alpha(\text{O})=3.59\times 10^{-7}$ 5 B(E2)(W.u.)=32 17 Mult.: Q, E2 from $\Delta\text{J}$ .
1284.10?	(8 <sup>+</sup> )	532.3 2 565.2 2 690.8 4 776.7 3		751.47 718.84 594.71? 507.50	8 <sup>+</sup> 7 <sup>+</sup> (6 <sup>+</sup> ) 6 <sup>+</sup>			
1506.7	(8 <sup>-</sup> )	688.5 3	100	818.20	(6 <sup>-</sup> )			
1589.71	10 <sup>+</sup>	442.6 2 838.2 1	11.1 21 100.0 12	1146.92 751.47	9 <sup>+</sup> 8 <sup>+</sup>	D E2	9.52 $\times 10^{-4}$	$\alpha(\text{K})=0.000840$ 12; $\alpha(\text{L})=9.33\times 10^{-5}$ 13; $\alpha(\text{M})=1.593\times 10^{-5}$ 23 $\alpha(\text{N})=2.13\times 10^{-6}$ 3; $\alpha(\text{O})=1.459\times 10^{-7}$ 21 B(E2)(W.u.)=60 5 Mult.: Q, E2 from $\Delta\text{J}$ .
1687.71	(9 <sup>-</sup> )	415 1 730.8 1	7.6 12 100 6	1272.21 956.91	8 <sup>-</sup> (7 <sup>-</sup> )	E2	1.35 $\times 10^{-3}$	$\alpha(\text{K})=0.001190$ 17; $\alpha(\text{L})=0.0001333$ 19; $\alpha(\text{M})=2.27\times 10^{-5}$ 4

## Adopted Levels, Gammas (continued)

							$\gamma(^{82}\text{Y})$ (continued)			
$E_i(\text{level})$	$J_i^\pi$	$E_\gamma$	$I_\gamma$	$E_f$	$J_f^\pi$	Mult.	$\alpha^\dagger$	Comments		
								$\alpha(\text{N})=3.04\times 10^{-6}$ 5; $\alpha(\text{O})=2.06\times 10^{-7}$ 3 B(E2)(W.u.)=71 25 Mult.: Q, E2 from $\Delta\text{J}$ .		
1687.71	(9 <sup>-</sup> )	936.2 3	12.8 12	751.47	8 <sup>+</sup>					
1960.03	11 <sup>+</sup>	370.2 1	97.1 12	1589.71	10 <sup>+</sup>	D				
		813.2 1	100.0 16	1146.92	9 <sup>+</sup>	(E2)	$1.03\times 10^{-3}$	B(E2)(W.u.)=91 22 $\alpha(\text{K})=0.000906$ 13; $\alpha(\text{L})=0.0001008$ 15; $\alpha(\text{M})=1.720\times 10^{-5}$ 24 $\alpha(\text{N})=2.30\times 10^{-6}$ 4; $\alpha(\text{O})=1.573\times 10^{-7}$ 22		
1963.7	(9 <sup>-</sup> )	800.3 3	100	1163.35	(7 <sup>-</sup> )					
2061.49	10 <sup>-</sup>	374 1	13.1 25	1687.71	(9 <sup>-</sup> )					
		789.3 1	100 4	1272.21	8 <sup>-</sup>	E2	$1.11\times 10^{-3}$	$\alpha(\text{K})=0.000977$ 14; $\alpha(\text{L})=0.0001088$ 16; $\alpha(\text{M})=1.86\times 10^{-5}$ 3 $\alpha(\text{N})=2.49\times 10^{-6}$ 4; $\alpha(\text{O})=1.694\times 10^{-7}$ 24 B(E2)(W.u.)=1.2 $\times 10^2$ 3 Mult.: Q, E2 from $\Delta\text{J}$ .		
2379.0?	(10 <sup>-</sup> )	914.5 3		1146.92	9 <sup>+</sup>					
2602.13	(11 <sup>-</sup> )	872.3 4	100	1506.7	(8 <sup>-</sup> )					
		541 1	$\leq 1.818$	2061.49	10 <sup>-</sup>					
		914.4 1	100 7	1687.71	(9 <sup>-</sup> )	E2	$7.70\times 10^{-4}$	B(E2)(W.u.)=1.3 $\times 10^2$ 3 $\alpha(\text{K})=0.000680$ 10; $\alpha(\text{L})=7.52\times 10^{-5}$ 11; $\alpha(\text{M})=1.283\times 10^{-5}$ 18 $\alpha(\text{N})=1.721\times 10^{-6}$ 24; $\alpha(\text{O})=1.183\times 10^{-7}$ 17		
2651.20	12 <sup>+</sup>	691.1 9	13 3	1960.03	11 <sup>+</sup>	D				
		1061.5 1	100.0 22	1589.71	10 <sup>+</sup>	E2	$5.44\times 10^{-4}$	B(E2)(W.u.)=63 10 $\alpha(\text{K})=0.000481$ 7; $\alpha(\text{L})=5.28\times 10^{-5}$ 8; $\alpha(\text{M})=9.01\times 10^{-6}$ 13 $\alpha(\text{N})=1.210\times 10^{-6}$ 17; $\alpha(\text{O})=8.38\times 10^{-8}$ 12		
2914.7	(11 <sup>-</sup> )	951 1	100	1963.7	(9 <sup>-</sup> )					
2970.8	13 <sup>+</sup>	320.3 4	53 10	2651.20	12 <sup>+</sup>	M1	0.00848	$\alpha(\text{K})=0.00748$ 11; $\alpha(\text{L})=0.000835$ 12; $\alpha(\text{M})=0.0001428$ 21 $\alpha(\text{N})=1.92\times 10^{-5}$ 3; $\alpha(\text{O})=1.334\times 10^{-6}$ 20 B(M1)(W.u.)=0.96 25		
		1010.5 3	100 14	1960.03	11 <sup>+</sup>	E2	$6.09\times 10^{-4}$	$\alpha(\text{K})=0.000538$ 8; $\alpha(\text{L})=5.92\times 10^{-5}$ 9; $\alpha(\text{M})=1.010\times 10^{-5}$ 15 $\alpha(\text{N})=1.356\times 10^{-6}$ 19; $\alpha(\text{O})=9.37\times 10^{-8}$ 14 B(E2)(W.u.)=69 15		
3026.0	12 <sup>-</sup>	423		2602.13	(11 <sup>-</sup> )					
		964.6 3	100	2061.49	10 <sup>-</sup>	E2	$6.78\times 10^{-4}$	$\alpha(\text{K})=0.000599$ 9; $\alpha(\text{L})=6.61\times 10^{-5}$ 10; $\alpha(\text{M})=1.128\times 10^{-5}$ 16 $\alpha(\text{N})=1.513\times 10^{-6}$ 22; $\alpha(\text{O})=1.043\times 10^{-7}$ 15 B(E2)(W.u.)=65 16 Mult.: Q, E2 from $\Delta\text{J}$ .		
3386.0	(12 <sup>-</sup> )	1007 1	100	2379.0?	(10 <sup>-</sup> )					
3674.94	(13 <sup>-</sup> )	1072.8 1	100	2602.13	(11 <sup>-</sup> )	(E2)	$5.31\times 10^{-4}$	B(E2)(W.u.)=113 15 $\alpha(\text{K})=0.000470$ 7; $\alpha(\text{L})=5.15\times 10^{-5}$ 8; $\alpha(\text{M})=8.79\times 10^{-6}$ 13 $\alpha(\text{N})=1.181\times 10^{-6}$ 17; $\alpha(\text{O})=8.19\times 10^{-8}$ 12		
3904.02	14 <sup>+</sup>	934 1	12 4	2970.8	13 <sup>+</sup>					
		1252.8 1	100 4	2651.20	12 <sup>+</sup>	E2	$3.96\times 10^{-4}$	$\alpha(\text{K})=0.000335$ 5; $\alpha(\text{L})=3.65\times 10^{-5}$ 6; $\alpha(\text{M})=6.23\times 10^{-6}$ 9		

## Adopted Levels, Gammas (continued)

$\gamma(^{82}\text{Y})$ (continued)								
$E_i$ (level)	$J_i^\pi$	$E_\gamma$	$I_\gamma$	$E_f$	$J_f^\pi$	Mult.	$\alpha^\dagger$	Comments
								$\alpha(\text{N})=8.38\times 10^{-7}$ 12; $\alpha(\text{O})=5.84\times 10^{-8}$ 9; $\alpha(\text{IPF})=1.703\times 10^{-5}$ 24 B(E2)(W.u.)=32 9 Mult.: Q, E2 from $\Delta J$ .
3934.7	(13 <sup>-</sup> )	1020 1	100	2914.7	(11 <sup>-</sup> )			
4142.6	15 <sup>+</sup>	237 1	8.7 20	3904.02	14 <sup>+</sup>			
		1171.8 1	100 9	2970.8	13 <sup>+</sup>	E2	$4.42\times 10^{-4}$	B(E2)(W.u.)=84 14
								$\alpha(\text{K})=0.000387$ 6; $\alpha(\text{L})=4.23\times 10^{-5}$ 6; $\alpha(\text{M})=7.21\times 10^{-6}$ 10
4150.0	14 <sup>-</sup>	1124.0 1	100	3026.0	12 <sup>-</sup>	E2	$4.80\times 10^{-4}$	$\alpha(\text{N})=9.69\times 10^{-7}$ 14; $\alpha(\text{O})=6.74\times 10^{-8}$ 10; $\alpha(\text{IPF})=4.61\times 10^{-6}$ 7
								$\alpha(\text{K})=0.000423$ 6; $\alpha(\text{L})=4.64\times 10^{-5}$ 7; $\alpha(\text{M})=7.91\times 10^{-6}$ 11
								$\alpha(\text{N})=1.063\times 10^{-6}$ 15; $\alpha(\text{O})=7.38\times 10^{-8}$ 11; $\alpha(\text{IPF})=1.383\times 10^{-6}$ 20
								B(E2)(W.u.)=62 16
								Mult.: Q, E2 from $\Delta J$ .
4413.0	(14 <sup>-</sup> )	1027 1	100	3386.0	(12 <sup>-</sup> )			
4885.9	(15 <sup>-</sup> )	1211.0 3	100	3674.94	(13 <sup>-</sup> )	(E2)	$4.17\times 10^{-4}$	$\alpha(\text{K})=0.000360$ 5; $\alpha(\text{L})=3.93\times 10^{-5}$ 6; $\alpha(\text{M})=6.71\times 10^{-6}$ 10
								$\alpha(\text{N})=9.02\times 10^{-7}$ 13; $\alpha(\text{O})=6.28\times 10^{-8}$ 9; $\alpha(\text{IPF})=9.60\times 10^{-6}$ 15
								B(E2)(W.u.)>39
5043.7?	(15 <sup>-</sup> )	1109 <sup>‡</sup> 1	100	3934.7	(13 <sup>-</sup> )			
5250.0	16 <sup>+</sup>	1107 1	8 3	4142.6	15 <sup>+</sup>			
		1346.0 2	100 11	3904.02	14 <sup>+</sup>	Q		
5414.4	16 <sup>-</sup>	1264.4 2	100	4150.0	14 <sup>-</sup>	Q		
5456.2	17 <sup>+</sup>	206 1	20 4	5250.0	16 <sup>+</sup>			
		1313.6 3	100 10	4142.6	15 <sup>+</sup>	E2	$3.73\times 10^{-4}$	B(E2)(W.u.)=69 15
								$\alpha(\text{K})=0.000303$ 5; $\alpha(\text{L})=3.30\times 10^{-5}$ 5; $\alpha(\text{M})=5.63\times 10^{-6}$ 8
								$\alpha(\text{N})=7.57\times 10^{-7}$ 11; $\alpha(\text{O})=5.29\times 10^{-8}$ 8; $\alpha(\text{IPF})=3.02\times 10^{-5}$ 5
6222.7	(17 <sup>-</sup> )	1336.7 3	100	4885.9	(15 <sup>-</sup> )	(Q)		
6672.1	18 <sup>+</sup>	1422.1 4	100	5250.0	16 <sup>+</sup>	(Q)		
6777.2	(18 <sup>-</sup> )	1362.8 2	100	5414.4	16 <sup>-</sup>			
6914.4	19 <sup>+</sup>	1458.2 3	100	5456.2	17 <sup>+</sup>	(E2)	$3.46\times 10^{-4}$	$\alpha(\text{K})=0.000245$ 4; $\alpha(\text{L})=2.65\times 10^{-5}$ 4; $\alpha(\text{M})=4.53\times 10^{-6}$ 7
								$\alpha(\text{N})=6.10\times 10^{-7}$ 9; $\alpha(\text{O})=4.27\times 10^{-8}$ 6; $\alpha(\text{IPF})=6.94\times 10^{-5}$ 10
								B(E2)(W.u.)>19
7591.2?	(19 <sup>-</sup> )	1368.5 <sup>‡</sup> 8	100	6222.7	(17 <sup>-</sup> )			
8187.6	(20 <sup>-</sup> )	1410.3 4	100	6777.2	(18 <sup>-</sup> )			
8194.2	20 <sup>+</sup>	1522.0 3	100	6672.1	18 <sup>+</sup>	(Q)		
8515.7	21 <sup>+</sup>	1601.3 2	100	6914.4	19 <sup>+</sup>	(Q)		
8602.2	(19 <sup>+</sup> ,20 <sup>+</sup> )	1930 1		6672.1	18 <sup>+</sup>			
9679.9	(22 <sup>-</sup> )	1492.3 8	100	8187.6	(20 <sup>-</sup> )			
9861.0	22 <sup>+</sup>	1666.8 4	100	8194.2	20 <sup>+</sup>	(Q)		
10267.1	(23 <sup>+</sup> )	1751.4 4	100	8515.7	21 <sup>+</sup>			
11712.8	(24 <sup>+</sup> )	1851.8 8	100	9861.0	22 <sup>+</sup>			
12080.1	(25 <sup>+</sup> )	1813 <sup>‡</sup> 1	100	10267.1	(23 <sup>+</sup> )			
13785.5	(26 <sup>+</sup> )	2072.7 <sup>‡</sup> 4	100	11712.8	(24 <sup>+</sup> )			
14032.3	(27 <sup>+</sup> )	1952.1 <sup>‡</sup> 4	100	12080.1	(25 <sup>+</sup> )			

Adopted Levels, Gammas (continued)

$\gamma(^{82}\text{Y})$  (continued)

<u>E<sub>i</sub>(level)</u>	<u>J<sub>i</sub><sup>π</sup></u>	<u>E<sub>γ</sub></u>	<u>I<sub>γ</sub></u>	<u>E<sub>f</sub></u>	<u>J<sub>f</sub><sup>π</sup></u>	<u>E<sub>i</sub>(level)</u>	<u>J<sub>i</sub><sup>π</sup></u>	<u>E<sub>γ</sub></u>	<u>I<sub>γ</sub></u>	<u>E<sub>f</sub></u>	<u>J<sub>f</sub><sup>π</sup></u>
1454.0+x	J+2	1454 <i>l</i>	100	x	J	11133.1+x	J+12	2264 <i>l</i>	100	8869.1+x	J+10
3059.0+x	J+4	1605 <i>l</i>	100	1454.0+x	J+2	13560+x	J+14	2427 <i>l</i>	100	11133.1+x	J+12
4833.0+x	J+6	1774 <i>l</i>	100	3059.0+x	J+4	16142+x	J+16	2582 <i>l</i>	100	13560+x	J+14
6769.1+x	J+8	1936 <i>l</i>	100	4833.0+x	J+6	18897+x?	J+18	2755 <sup>‡</sup> 2	100	16142+x	J+16
8869.1+x	J+10	2100 <i>l</i>	100	6769.1+x	J+8						

<sup>†</sup> Additional information 2.

<sup>‡</sup> Placement of transition in the level scheme is uncertain.

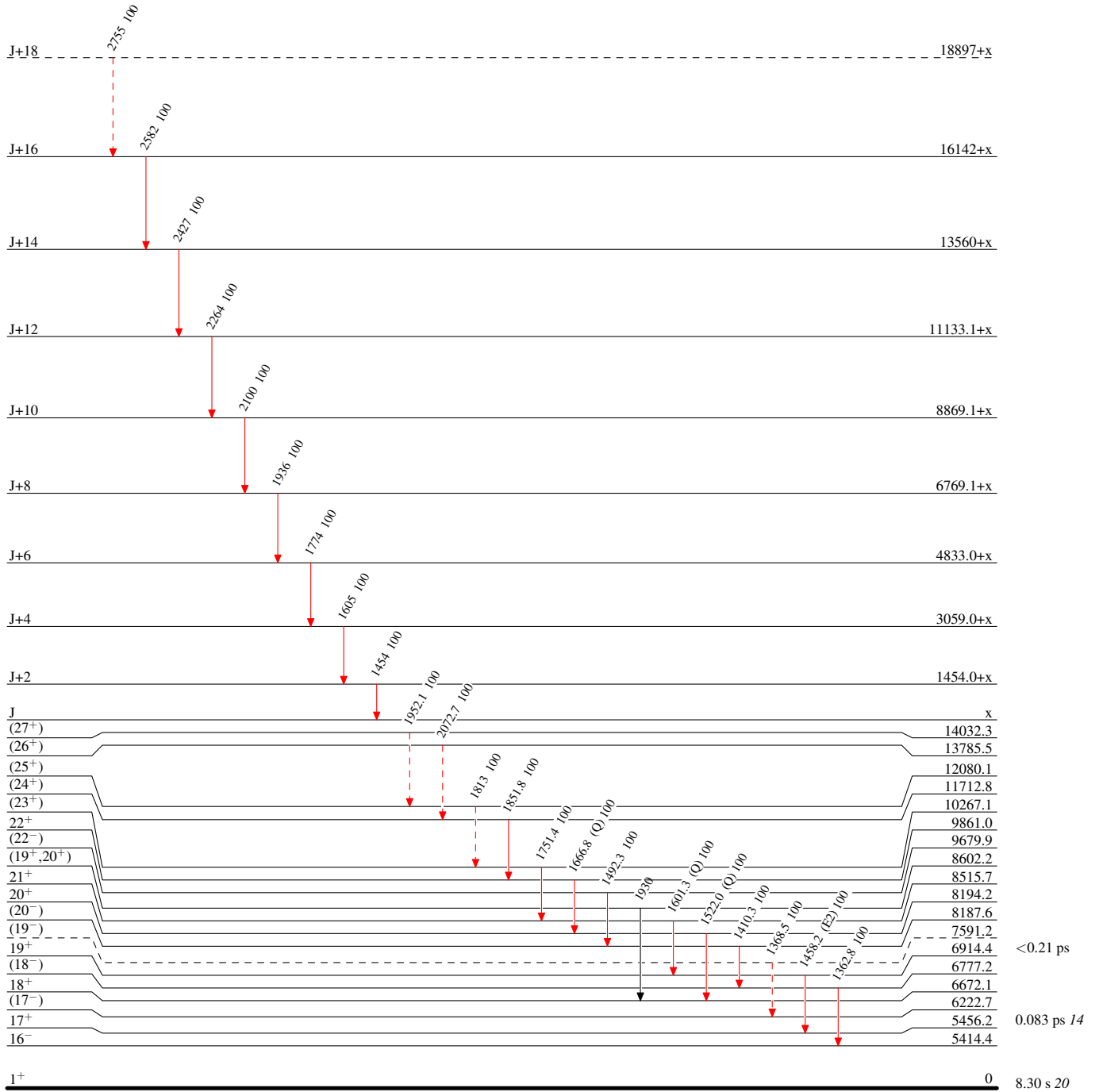


**Adopted Levels, Gammas**

Legend

**Level Scheme**  
 Intensities: Type not specified

- ▶  $I_\gamma < 2\% \times I_\gamma^{max}$
- ▶  $I_\gamma < 10\% \times I_\gamma^{max}$
- ▶  $I_\gamma > 10\% \times I_\gamma^{max}$
- - - - -▶  $\gamma$  Decay (Uncertain)



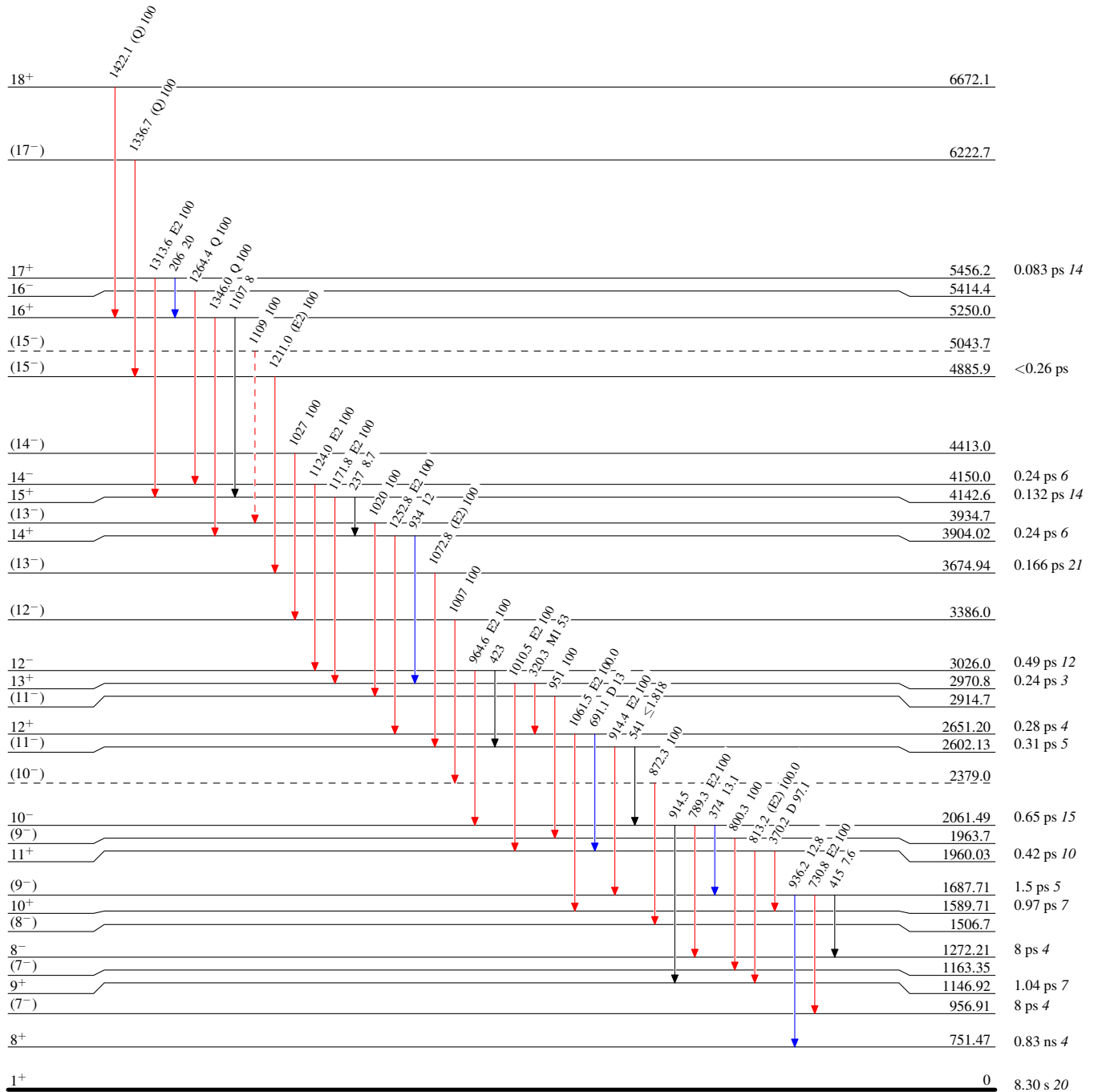
**Adopted Levels, Gammas**

Legend

Level Scheme (continued)

Intensities: Type not specified

- ▶  $I_\gamma < 2\% \times I_\gamma^{max}$
- ▶  $I_\gamma < 10\% \times I_\gamma^{max}$
- ▶  $I_\gamma > 10\% \times I_\gamma^{max}$
- - - -▶  $\gamma$  Decay (Uncertain)



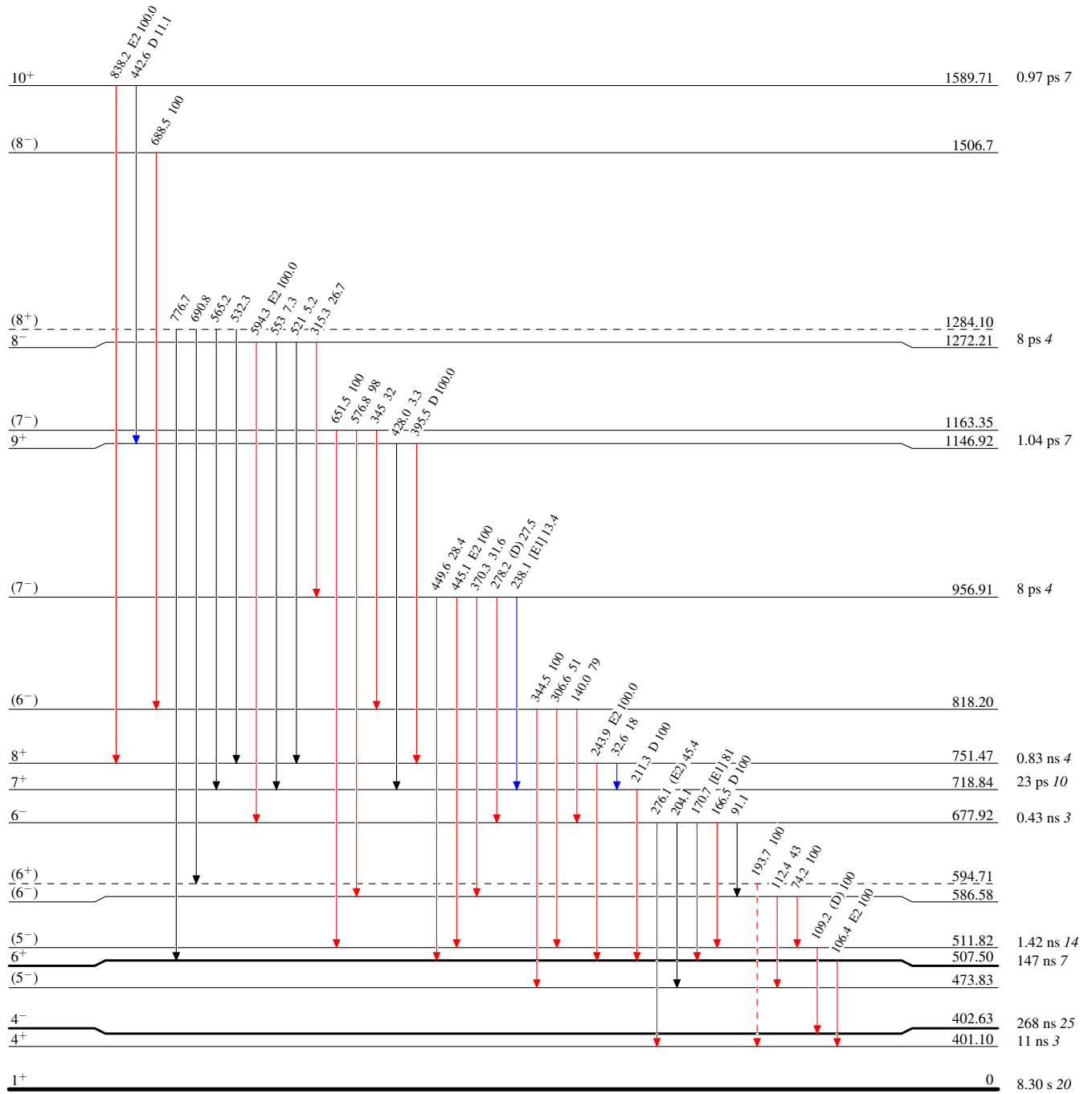
**Adopted Levels, Gammas**

Legend

**Level Scheme (continued)**

Intensities: Type not specified

- ▶  $I_\gamma < 2\% \times I_\gamma^{max}$
- ▶  $I_\gamma < 10\% \times I_\gamma^{max}$
- ▶  $I_\gamma > 10\% \times I_\gamma^{max}$
- - - -▶  $\gamma$  Decay (Uncertain)



$^{82}_{39}\text{Y}_{43}$

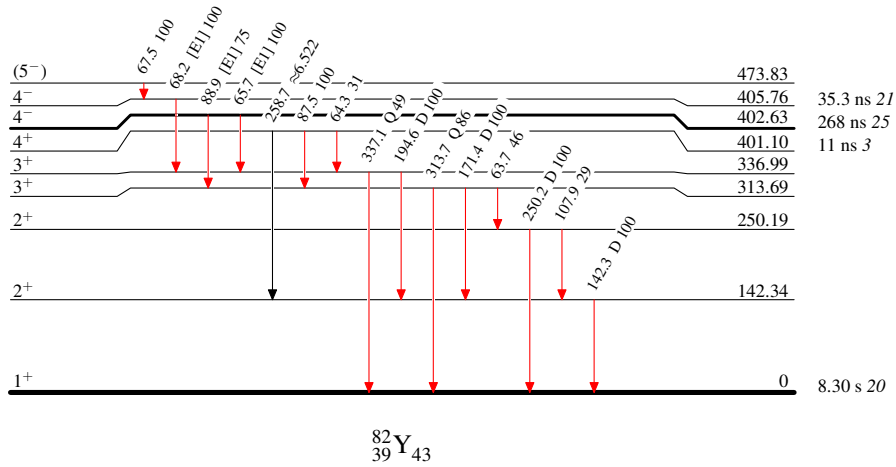
**Adopted Levels, Gammas**

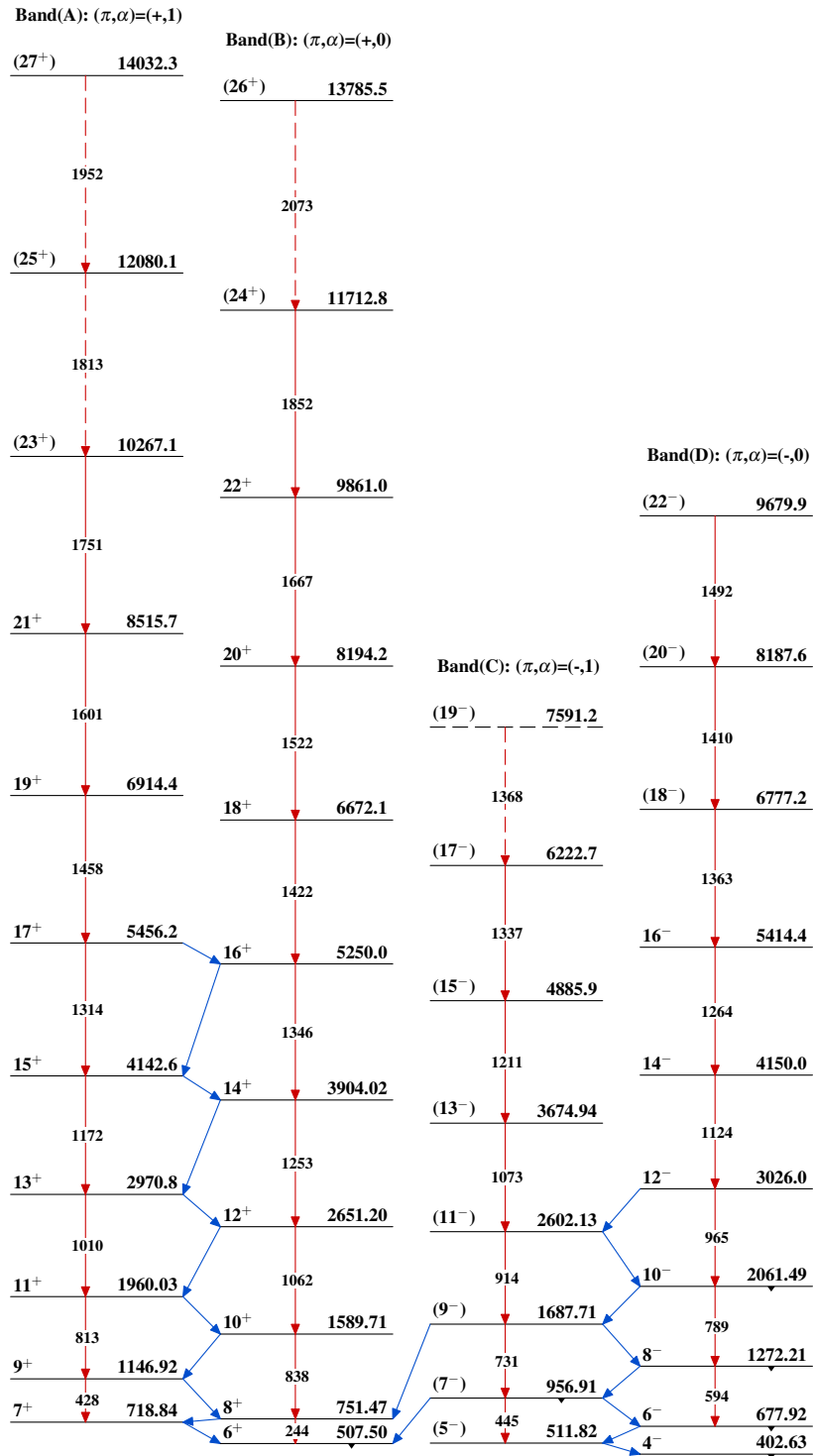
**Level Scheme (continued)**

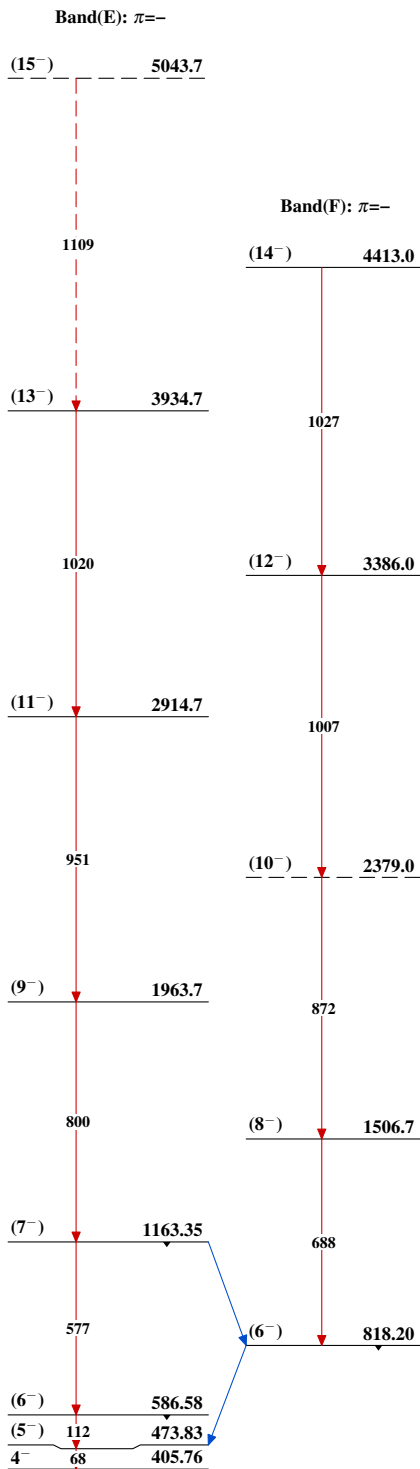
Intensities: Type not specified

**Legend**

- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$

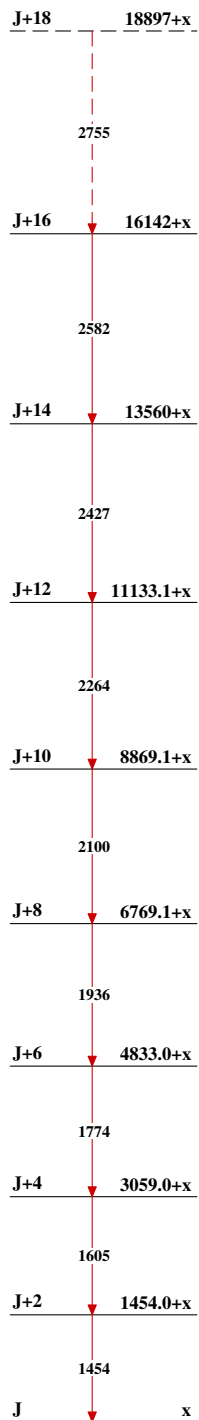


Adopted Levels, Gammas $^{82}_{39}\text{Y}_{43}$

**Adopted Levels, Gammas (continued)** $^{82}_{39}\text{Y}_{43}$

Adopted Levels, Gammas (continued)

Band(G): SD band, ( $\pi$ ,  
 $\alpha$ )=(-,0) (1995Da30,  
2003Le08)

 $^{82}_{39}\text{Y}_{43}$