

Adopted Levels, Gammas

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	E. Browne, J. K. Tuli		NDS 114, 1041 (2013)	1-Nov-2011

Q(β⁻)=-4383 SY; S(n)=7997 SY; S(p)=2066 20; Q(α)=8556 7 2012Wa38

Estimated ΔQ(β⁻)=116, ΔS(n)=302 (2012Wa38).

Additional information 1.

Calculations, compilation:

α decay: 1993Bu09.

g.s. properties: 1997Mo25, 1995Mo29.

Single-particle Nilsson levels: 2010Ad19, 2004Pa40, 2004HeZZ, 2003Be41, 1994Cw02.

1994Cw02 have calculated the following single-particle level sequence: g.s., 7/2[514]; 0.14 MeV, 9/2[624]; 0.15 MeV, 1/2[521];

0.73 MeV, 5/2[512]; 0.87 MeV, 7/2[633].

Q(α) and T_{1/2}: 2011Sa40, 2010Si27, 2009Do22, 2008Do12, 2002Lo05.

Assignment: ²⁴⁹Cf(¹⁰B,4n), ²⁴⁹Cf(¹¹B,5n), ²⁴³Am(¹⁶O,4n) excit (1971Es01).

²⁵⁵Lr Levels

Cross Reference (XREF) Flags

- A ²⁰⁹Bi(⁴⁸Ca,2nγ)
- B ²⁵⁵Lr IT decay (2.54 s)
- C ²⁵⁹Db α decay
- D ²⁵⁵Lr IT decay (1.70 ms)

E(level) ^d	J ^π [†]	T _{1/2}	XREF	Comments
0.0	[1/2 ⁻]	31.1 s 11	ABCD	%α=99.7 I; %ε=0.3 I; %SF<0.1 %α Deduced by evaluators from data in 2008Ha31. Other values: %α=85 I5\$ %ε+%β ⁺ <30\$ %SF<0.1, from 1971Es01. Upper limit deduced from comparison of possible ²⁵⁵ No (ε daughter) α's to ²⁵⁵ Lr α's. %SF from T _{1/2} (SF)>6 h (1976Og02,2000Ho27) and T _{1/2} =31.1 s. J ^π : Expected from theory (2002Lo05). Other: 2008KeZY. T _{1/2} : Weighted average of 31 s 2 (2008Ha31) and 31.1 s 13 (2006Ch52). Other values: 22 s 5 (1971Es01), 21.5 s 50 (1976BeYM), and>19.1 s (2008An16), 21 s 8 (2001Ga20).
38 ^{#b} 10	[7/2 ⁻]	2.54 s 5	AB D	%α≈40 (2006Ch52); %IT≈60 J ^π : Expected from theory (2002Lo05). Other: 2008KeZY. T _{1/2} : Weighted average of 2.6 s 1 (2008Ha31), 2.53 s 13 (2006Ch52), and 2.53 s 5 (2008An16).
38+x ^{#b}	(9/2 ⁻)		A	
y [@]	(9/2 ⁺)		A	
69.5+y ^{@c} 4	(11/2 ⁺)		A	
151.8+y ^{@c} 5	(13/2 ⁺)		A	
196.6 ^{‡c} 5	5/2 ⁻		A	
227.0+x ^{#b} 10	(11/2 ⁻)		A	
253.0+x ^{#b} 10	(13/2 ⁻)		A	
246.5+y ^{@c} 5	(15/2 ⁺)		A	
353.4+y ^{@c} 6	(17/2 ⁺)		A	
443.8 ^{‡b} 7	9/2 ⁻		A	
466.0 ^{#b} 15	(15/2 ⁻)		A	

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Adopted Levels, Gammas (continued)

²⁵⁵Lr Levels (continued)

E(level) ^d	J ^π †	T _{1/2}	XREF	Comments
517.6+x ^{#b} 12	(17/2 ⁻)		A	
740.0 ^{‡b} 9	(13/2 ⁻)		A	
754.4+x ^{#b} 15	(19/2 ⁻)		A	
740.0+y ^{ac} 5	(15/2 ⁺)	<1 μs	A	T _{1/2} : From 2009Je02.
831.6+x ^{#b}	(21/2 ⁻)		A	
850.4+y ^{ac} 6	(17/2 ⁺)		A	
878.8+y ^{&c} 10	(19/2 ⁻)	≥10 ns	A	T _{1/2} : From 2009Je02.
972.9+y ^{ac}	(19/2 ⁺)		A	
1016.3+y ^{&c} 10	(21/2 ⁻)		A	
1082.9 ^{‡b} 10	(17/2 ⁻)		A	
1092.4+x ^{#b} 18	(23/2 ⁻)		A	
1108.0+y ^{ac} 10	(21/2 ⁺)		A	
1191.6+x ^{#b} 16	(25/2 ⁻)		A	
1164.7+y ^{&c} 10	(23/2 ⁻)		A	
1408.6+y ^c 10	(25/2 ⁺)	1.70 ms 3	A D	%α<0.15 (2008An16); %IT>99.85 T _{1/2} : Other value: 1.4 ms 1, from 100-keV conversion electrons observed in coincidence with 588-keV γ ray (2008Ha31); 1.81 ms 2 (2008An16).
1469.9 ^{‡b} 15	(21/2 ⁻)		A	
1476.4 ^{#b} 21	(27/2 ⁻)		A	
1899.9 ^{‡b} 18	(25/2 ⁻)		A	

† Based on rotational band structure and γ-ray decay patterns, unless otherwise specified.

‡ Band(A): 1/2[521] band.

Band(B): 7/2[514] band.

@ Band(C): 9/2[624] band.

& Band(D): K=(19/2⁻) band.

^a Band(E): K=(15/2⁺) band.

^b From 2009Ke02 in ²⁰⁹Bi(⁴⁸Ca,2nγ).

^c From 2009Je02 in ²⁰⁹Bi(⁴⁸Ca,2nγ).

^d Deduced by evaluators from least-squares fit to γ-ray energies.

γ(²⁵⁵Lr)

E _i (level)	J _i ^π	E _γ	I _γ	E _f	J _f ^π	Mult.	α [#]	Comments
69.5+y	(11/2 ⁺)	69.5 [‡] 4	100 [‡]	y	(9/2 ⁺)	[M1]	41.7 10	α(L)=31.1 7; α(M)=7.75 17; α(N+..)=2.91 7 α(N)=2.19 5; α(O)=0.593 13; α(P)=0.118 3; α(Q)=0.00765 17
151.8+y	(13/2 ⁺)	82.3 [‡] 3	100 [‡]	69.5+y	(11/2 ⁺)	[M1]	25.5 5	α(L)=19.0 4; α(M)=4.73 9; α(N+..)=1.77 4 α(N)=1.336 24; α(O)=0.362 7; α(P)=0.0723 13; α(Q)=0.00466 9
196.6	5/2 ⁻	196.6 [†] 5	100	0.0	[1/2 ⁻]			
227.0+x	(11/2 ⁻)	189 [†] 1	100	38	[7/2 ⁻]			
253.0+x	(13/2 ⁻)	215 [†] 1	100	38+x	(9/2 ⁻)			
246.5+y	(15/2 ⁺)	94.7 [‡] 3	100 [‡]	151.8+y	(13/2 ⁺)	[M1]	16.9 3	α(L)=12.62 22; α(M)=3.14 6; α(N+..)=1.180 20 α(N)=0.888 15; α(O)=0.241 4; α(P)=0.0481 8; α(Q)=0.00310 6
		177.0 [‡] 4	33 [‡] 11	69.5+y	(11/2 ⁺)	[E2]	2.79 5	α(K)=0.1218 18; α(L)=1.91 4; α(M)=0.552 10; α(N+..)=0.208 4

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Adopted Levels, Gammas (continued)

$\gamma(^{255}\text{Lr})$ (continued)

$E_i(\text{level})$	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	$\alpha^\#$	Comments
353.4+y	(17/2 ⁺)	107	100	246.5+y	(15/2 ⁺)			$\alpha(\text{N})=0.159$ 3; $\alpha(\text{O})=0.0416$ 8; $\alpha(\text{P})=0.00701$ 12; $\alpha(\text{Q})=5.54 \times 10^{-5}$ 9 E_γ : From Fig. 2 in 2009Je02 .
443.8	9/2 ⁻	247.2 [†] 5	100	196.6	5/2 ⁻			
466.0	(15/2 ⁻)	239 [†] 1	100	227.0+x	(11/2 ⁻)			
517.6+x	(17/2 ⁻)	264.6 [†] 5	100	253.0+x	(13/2 ⁻)			
740.0	(13/2 ⁻)	296.2 [†] 5	100	443.8	9/2 ⁻			
754.4+x	(19/2 ⁻)	288.4 [†] 4	100					
740.0+y	(15/2 ⁺)	386.6 [‡] 4	23 [‡] 8	353.4+y	(17/2 ⁺)	[M1]	1.341	$\alpha(\text{K})=1.030$ 15; $\alpha(\text{L})=0.232$ 4; $\alpha(\text{M})=0.0576$ 9; $\alpha(\text{N}+..)=0.0216$ 3 $\alpha(\text{N})=0.01625$ 24; $\alpha(\text{O})=0.00440$ 7; $\alpha(\text{P})=0.000877$ 13; $\alpha(\text{Q})=5.58 \times 10^{-5}$ 8
		493.5 [‡] 3	100 [‡] 14	246.5+y	(15/2 ⁺)	[M1]	0.685	$\alpha(\text{K})=0.526$ 8; $\alpha(\text{L})=0.1181$ 17; $\alpha(\text{M})=0.0293$ 5; $\alpha(\text{N}+..)=0.01098$ 16 $\alpha(\text{N})=0.00827$ 12; $\alpha(\text{O})=0.00224$ 4; $\alpha(\text{P})=0.000446$ 7; $\alpha(\text{Q})=2.83 \times 10^{-5}$ 4
		588.1 [‡] 3	91 [‡] 15	151.8+y	(13/2 ⁺)	[M1]	0.424	$\alpha(\text{K})=0.326$ 5; $\alpha(\text{L})=0.0729$ 11; $\alpha(\text{M})=0.0181$ 3; $\alpha(\text{N}+..)=0.00677$ 10 $\alpha(\text{N})=0.00510$ 8; $\alpha(\text{O})=0.001380$ 20; $\alpha(\text{P})=0.000275$ 4; $\alpha(\text{Q})=1.746 \times 10^{-5}$ 25
831.6+x	(21/2 ⁻)	314.0 [†] 5	100	517.6+x	(17/2 ⁻)			
850.4+y	(17/2 ⁺)	110.4 [‡] 3	100 [‡]	740.0+y	(15/2 ⁺)	[M1]	10.86 18	$\alpha(\text{L})=8.09$ 13; $\alpha(\text{M})=2.02$ 4; $\alpha(\text{N}+..)=0.756$ 13 $\alpha(\text{N})=0.569$ 10; $\alpha(\text{O})=0.1542$ 25; $\alpha(\text{P})=0.0308$ 5; $\alpha(\text{Q})=0.00198$ 4
878.8+y	(19/2 ⁻)	(28)	100	850.4+y	(17/2 ⁺)	[E1]	2.68	$\alpha(\text{L})=1.516$ 22; $\alpha(\text{M})=0.856$ 12; $\alpha(\text{N}+..)=0.306$ 5 $\alpha(\text{N})=0.239$ 4; $\alpha(\text{O})=0.0585$ 9; $\alpha(\text{P})=0.00763$ 11; $\alpha(\text{Q})=0.0001590$ 23
972.9+y	(19/2 ⁺)	123 [‡] 1	100 [‡]	850.4+y	(17/2 ⁺)	[M1]	7.95 22	$\alpha(\text{L})=5.92$ 17; $\alpha(\text{M})=1.48$ 4; $\alpha(\text{N}+..)=0.554$ 16 $\alpha(\text{N})=0.417$ 12; $\alpha(\text{O})=0.113$ 4; $\alpha(\text{P})=0.0225$ 7; $\alpha(\text{Q})=0.00145$ 4
1016.3+y	(21/2 ⁻)	137.4 [‡] 4	100 [‡]	878.8+y	(19/2 ⁻)	[M1]	5.78 10	$\alpha(\text{L})=4.31$ 7; $\alpha(\text{M})=1.073$ 18; $\alpha(\text{N}+..)=0.402$ 7 $\alpha(\text{N})=0.303$ 5; $\alpha(\text{O})=0.0821$ 14; $\alpha(\text{P})=0.0164$ 3; $\alpha(\text{Q})=0.001051$ 18
1082.9	(17/2 ⁻)	342.9 [†] 5	100	740.0	(13/2 ⁻)			
1092.4+x	(23/2 ⁻)	338 [†] 1	100	754.4+x	(19/2 ⁻)			
1108.0+y	(21/2 ⁺)	135.2 [‡] 3	100 [‡]	972.9+y	(19/2 ⁺)	[M1]	6.06	$\alpha(\text{L})=4.51$ 7; $\alpha(\text{M})=1.123$ 18; $\alpha(\text{N}+..)=0.422$ 7 $\alpha(\text{N})=0.317$ 5; $\alpha(\text{O})=0.0860$ 14; $\alpha(\text{P})=0.0172$ 3; $\alpha(\text{Q})=0.001101$ 17
1191.6+x	(25/2 ⁻)	360 [†] 1	100	831.6+x	(21/2 ⁻)			
1164.7+y	(23/2 ⁻)	148.3 [‡] 4	100 [‡]	1016.3+y	(21/2 ⁻)	[M1]	4.64 8	$\alpha(\text{L})=3.46$ 6; $\alpha(\text{M})=0.861$ 14; $\alpha(\text{N}+..)=0.323$ 6 $\alpha(\text{N})=0.243$ 4; $\alpha(\text{O})=0.0659$ 11; $\alpha(\text{P})=0.01315$ 21; $\alpha(\text{Q})=0.000843$ 14
1408.6+y	(25/2 ⁺)	243.9 [‡] 3	61 [‡] 15	1164.7+y	(23/2 ⁻)	[E1]	0.0790	$\alpha(\text{K})=0.0596$ 9; $\alpha(\text{L})=0.01446$ 21; $\alpha(\text{M})=0.00360$ 6; $\alpha(\text{N}+..)=0.001328$ 19

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Adopted Levels, Gammas (continued) $\gamma(^{255}\text{Lr})$ (continued)

<u>$E_i(\text{level})$</u>	<u>J_i^π</u>	<u>E_γ</u>	<u>I_γ</u>	<u>E_f</u>	<u>J_f^π</u>	<u>Mult.</u>	<u>$\alpha^\#$</u>	<u>Comments</u>
1408.6+y	(25/2 ⁺)	300.6 [‡] 3	100 [‡] 12	1108.0+y	(21/2 ⁺)	[E2]	0.389	$\alpha(\text{N})=0.001009$ 15; $\alpha(\text{O})=0.000267$ 4; $\alpha(\text{P})=4.92\times 10^{-5}$ 7; $\alpha(\text{Q})=2.25\times 10^{-6}$ 4 $\alpha(\text{K})=0.0893$ 13; $\alpha(\text{L})=0.215$ 4; $\alpha(\text{M})=0.0612$ 9; $\alpha(\text{N}+..)=0.0230$ 4 $\alpha(\text{N})=0.0176$ 3; $\alpha(\text{O})=0.00462$ 7; $\alpha(\text{P})=0.000802$ 12; $\alpha(\text{Q})=1.159\times 10^{-5}$ 17
1469.9	(21/2 ⁻)	387 [†] 1	100	1082.9	(17/2 ⁻)			
1476.4	(27/2 ⁻)	384 [†] 1	100	1082.9	(17/2 ⁻)			
1899.9	(25/2 ⁻)	430 [†] 1	100	1469.9	(21/2 ⁻)			

[†] From [2009Ke02](#), assumed E2.

[‡] From [2009Je02](#) in $^{209}\text{Bi}(^{48}\text{Ca},2n\gamma)$.

[#] Total theoretical internal conversion coefficients, calculated using the BrIcc code ([2008Ki07](#)) with Frozen orbital approximation based on γ -ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

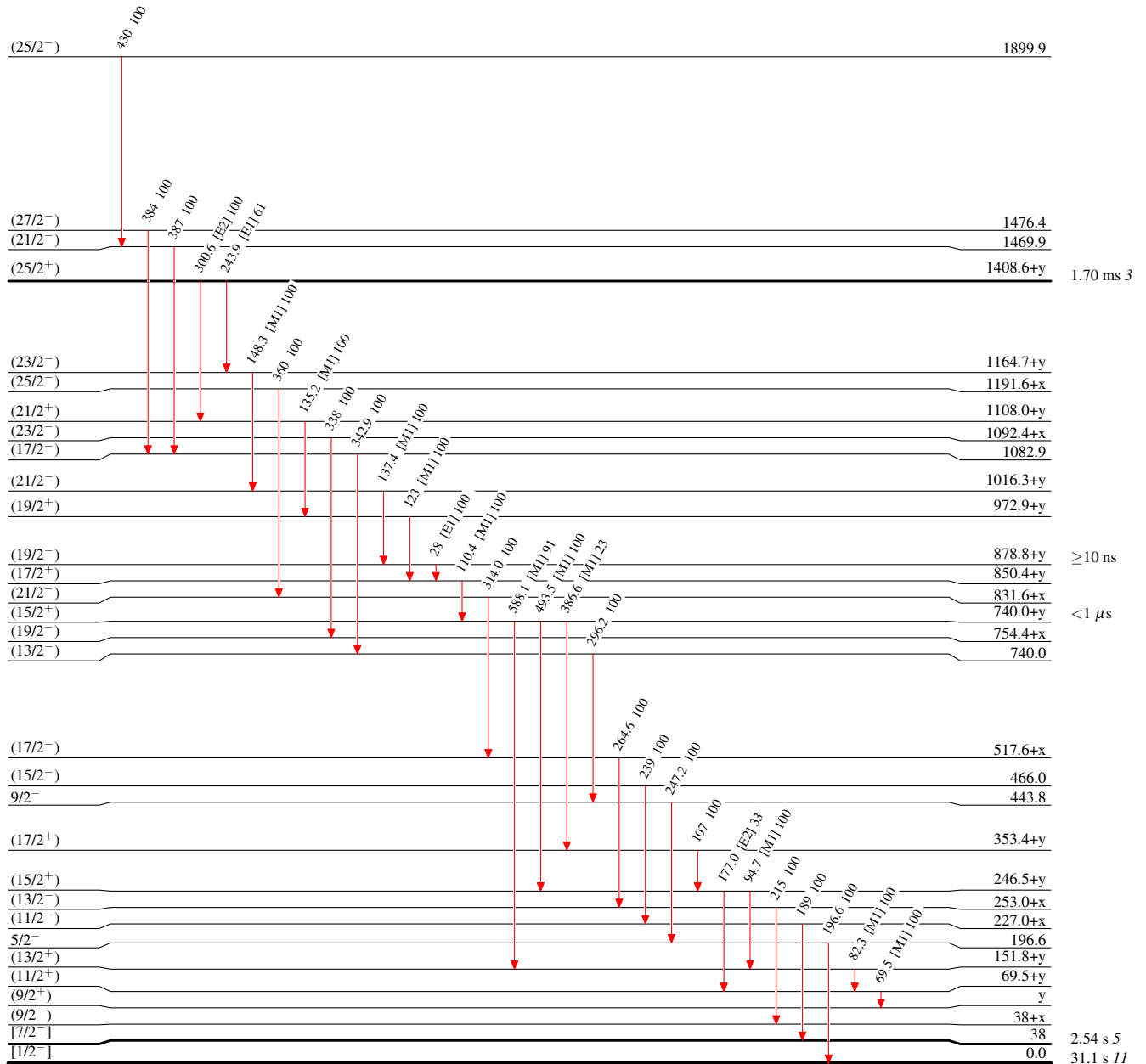
Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Type not specified

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

 $^{255}_{103}\text{Lr}_{152}$

Adopted Levels, Gammas

Band(A): 1/2[521] band

 $(25/2^-)$ 1899.9

430

 $(21/2^-)$ 1469.9

387

 $(17/2^-)$ 1082.9

343

 $(13/2^-)$ 740.0

296

 $9/2^-$ 443.8

247

 $5/2^-$ 196.6

Band(B): 7/2[514] band

 $(27/2^-)$ 1476.4 $(25/2^-)$ 1191.6+x $(23/2^-)$ 1092.4+x

360

338

 $(21/2^-)$ 831.6+x $(19/2^-)$ 754.4+x

314

 $(17/2^-)$ 517.6+x $(15/2^-)$ 466.0

265

239

 $(13/2^-)$ 253.0+x $(11/2^-)$ 227.0+x

215

189

 $(9/2^-)$ 38+x $(7/2^-)$ 38Band(D): K=(19/2⁻) band $(23/2^-)$ 1164.7+y

148

 $(21/2^-)$ 1016.3+y

137

 $(19/2^-)$ 878.8+yBand(E): K=(15/2⁺) band $(21/2^+)$ 1108.0+y

135

 $(19/2^+)$ 972.9+y

123

 $(17/2^+)$ 850.4+y

110

 $(15/2^+)$ 740.0+y

Band(C): 9/2[624] band

 $(17/2^+)$ 353.4+y

107

 $(15/2^+)$ 246.5+y

95

 $(13/2^+)$ 151.8+y

82

 $(11/2^+)$ 69.5+y

70

 $(9/2^+)$ y $^{255}_{103}\text{Lr}_{152}$