Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	NDS 141,327 (2017)	22-Mar-2017

Q(β^-)=−6280 *syst*; S(n)=8180 *syst*; S(p)=3014 *25*; Q(α)=8926 *15* 2017Wa10
Estimated ΔQ(β^-)=240, ΔS(n)=120 (2017Wa10).
S(2n)=15120 *280* (syst), S(2p)=5079 *20*, Q(εp)=126 *23* (2017Wa10).
Isotopic identification and assignment:
1975Og01: ^{208}Pb(^{50}Ti,2n) excitation function.
1984Og02: ^{208}Pb(^{50}Ti,2n); ^{208}Pb(^{49}Ti,n) SF observed.
1984Og02, 1985Mu11: daughter of ^{260}Sg.
1985He06: ^{208}Pb(^{50}Ti,2n),E=4.75-5.15 MeV/nucleon; ^{207}Pb(^{50}Ti,n),E=4.85 MeV/nucleon; parent of ^{252}No (8410α).
1985So03: ^{249}Cf(^{12}C,5n),E=85 MeV, SF observed.
Theoretical calculations: consult the Nuclear Science References (NSR) database for about 125 theory references.
2014Li15, 2012Jo05: nuclear structure theory references.

^{256}Rf Levels

Cross Reference (XREF) Flags

A ^{260}Sg α decay (4.95 ms)
B ^{208}Pb(^{50}Ti,2nγ)

E(level)[†]	J$^\pi$	$T_{1/2}$	XREF	Comments
0.0[#]	0$^+$	6.67 ms *10*	AB	%α=0.32 *17* (1997He29); %SF=99.68 *17* $T_{1/2}$: weighted average of 6.9 ms *2* (2013Ri07, 2012Gr12 from time difference between recoil and fission events), 6.9 ms *4* (2011Ro20, from time distribution of fission events in SF decay of 783 events), 6.70 ms *9* (2008Dr05), 6.2 ms *2* (1997He29), 6.7 ms *2* (1984Og02). Other measurements: 5 ms (from SF activity, 1975Og01); 7.4 ms *+9−7* (from SF activity, 1985He06); 10 ms *+47−4* (from α activity, 1985He06); 6.3 ms *+27−14* (from SF activity following ^{260}Sg α decay, 1985Mu11); 9 ms *2* (from SF activity, 1985So03). The α branching was determined by 1997He29 as (0.32±0.17)%. Authors′ earlier measurement: (2.2 +7.3−1.8)% (1985He06).
44[#] *1*	(2$^+$)		AB	E(level): deduced from Harris fit of rotational band members (2012Gr12). Others: ≈46 (2009Je01), 51 *35* from ^{260}Sg α decay. J$^\pi$: α hindrance factor; systematics of first excited-state energies of even-even nuclei.
148[#] *2*	(4$^+$)		B	E(level): deduced from Harris fit of rotational band members (2012Gr12).
309[#] *2*	(6$^+$)		B	
527[#] *2*	(8$^+$)		B	
799[#] *2*	(10$^+$)		B	
≈946	(3$^-$)		B	E(level),J$^\pi$: from (electron)(900γ) (2009Je01), possible member of K^π=2$^-$ band.
≈1120[‡]	(5$^-$)	25[‡] μs *2*	B	%IT=?; %SF=? J$^\pi$: assigned by 2013Ri07 as K^π=(5$^-$) with possible 2-qp configuration=(π1/2[521]⊗π9/2[624])$_{5-}$. $T_{1/2}$: 2011Ro20 state that their observed isomer of 17 μs *5* (half-life from time distribution of conversion electrons and maximum likelihood method) may correspond to the 25−μs *2* isomer in 2009Je01, although, the isomer population ratio of ≈5% *2* (with respect to that of ^{256}Rf g.s.) is much smaller than ≈27% deduced by 2011Ro20 from data in 2009Je01. Due to its low population and several other arguments against its assignment as a 2-qp isomer, 2011Ro20 suggest that their observed 17−μs isomer is more likely a 4-qp state.

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Adopted Levels, Gammas (continued)

^{256}Rf Levels (continued)

E(level)[†]	J$^\pi$	T$_{1/2}$	XREF	Comments
1122[#] *3*	(12$^+$)		B	
≈1400[‡]	(8$^-$)	17[‡] μs *2*	B	%IT=?; %SF=? E(level): isomer not found in 2011Ro20, perhaps due to low statistics. J$^\pi$: assigned by 2013Ri07 as K^π=(8$^-$) with possible 2-qp configuration=$(\pi 7/2[514]\otimes\pi 9/2[624])_{8^-}$. T$_{1/2}$: other: 13.2 μs *33* (2010Be16).
1493[#] *3*	(14$^+$)		B	
1910[#] *4*	(16$^+$)		B	
>2200[‡]		27[‡] μs *5*	B	%IT=?; %SF=? E(level): isomer not found in 2011Ro20, perhaps due to low statistics. T$_{1/2}$: other: 36.5 μs *86* (2010Be16). Possible 4-qp state (2009Je01,2013Ri07).
2369[#] *4*	(18$^+$)		B	
2868[#] *5*	(20$^+$)		B	

[†] From Eγ data in 2012Gr12, unless otherwise stated.
[‡] From 2009Je01. Level energy deduced from (electron)(900γ) coin. Half-life from recoil-electron-electron-electron-fission(t). Isomers at ≈1120 and ≈1400 keV interpreted by 2009Je01 as possible 2-qp states, while the one at >2000 keV is interpreted as possible 4-qp state. See also 2011Ro20 where only one isomer of 17 μs *5* was seen and interpreted as possible 4-qp state.
[#] Band(A): K^π=0$^+$ band. Band assignment from 2012Gr12.

γ(^{256}Rf)

E$_i$(level)	J$_i^\pi$	E$_\gamma$	I$_\gamma$	E$_f$	J$_f^\pi$	Mult.	α[‡]	Comments
44	(2$^+$)	(44[†] *1*)	100	0.0	0$^+$	[E2]	1.83×10^3 *22*	α(L)=1.30×10^3 *16*; α(M)=3.8×10^2 *5* α(N)=111 *14*; α(O)=29 *4*; α(P)=4.9 *6*; α(Q)=0.0157 *16*
148	(4$^+$)	(104[†] *1*)	100	44	(2$^+$)	[E2]	31.5 *15*	α(L)=22.4 *11*; α(M)=6.6 *4* α(N)=1.91 *9*; α(O)=0.502 *24*; α(P)=0.086 *4*; α(Q)=0.000476 *20*
309	(6$^+$)	161 *1*	100	148	(4$^+$)	[E2]	4.51 *14*	α(K)=0.093 *3*; α(L)=3.15 *10*; α(M)=0.92 *3* α(N)=0.266 *9*; α(O)=0.0701 *22*; α(P)=0.0121 *4*; α(Q)=9.78×10^{-5} *25*
527	(8$^+$)	218 *1*	100	309	(6$^+$)	[E2]	1.33 *3*	α(K)=0.1204 *17*; α(L)=0.861 *21*; α(M)=0.249 *6* α(N)=0.0721 *18*; α(O)=0.0190 *5*; α(P)=0.00334 *8*; α(Q)=3.68×10^{-5} *8*
799	(10$^+$)	272 *1*	100	527	(8$^+$)	[E2]	0.589 *12*	α(K)=0.1016 *15*; α(L)=0.349 *8*; α(M)=0.1003 *21* α(N)=0.0290 *6*; α(O)=0.00767 *16*; α(P)=0.00136 *3*; α(Q)=1.93×10^{-5} *4*
≈946	(3$^-$)	900 *1*		44	(2$^+$)			E$_\gamma$: from 2009Je01.
1122	(12$^+$)	323 *1*	100	799	(10$^+$)	[E2]	0.333 *6*	α(K)=0.0832 *12*; α(L)=0.179 *4*; α(M)=0.0510 *10* α(N)=0.0147 *3*; α(O)=0.00390 *8*; α(P)=0.000701 *13*; α(Q)=1.213×10^{-5} *20*
1493	(14$^+$)	371 *1*	100	1122	(12$^+$)	[E2]	0.218 *4*	α(K)=0.0692 *10*; α(L)=0.1069 *19*; α(M)=0.0302 *6* α(N)=0.00870 *15*; α(O)=0.00231 *4*; α(P)=0.000419 *8*; α(Q)=8.51×10^{-6} *14*
1910	(16$^+$)	417 *2*	100	1493	(14$^+$)			
2369	(18$^+$)	459 *2*	100	1910	(16$^+$)			
2868	(20$^+$)	499 *2*	100	2369	(18$^+$)			

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Adopted Levels, Gammas (continued)

$\gamma(^{256}Rf)$ (continued)

† Calculated value from Harris fit in a rotational band.
‡ Theoretical values from BrIcc code (2008Ki07) using "Frozen orbital" approximation.

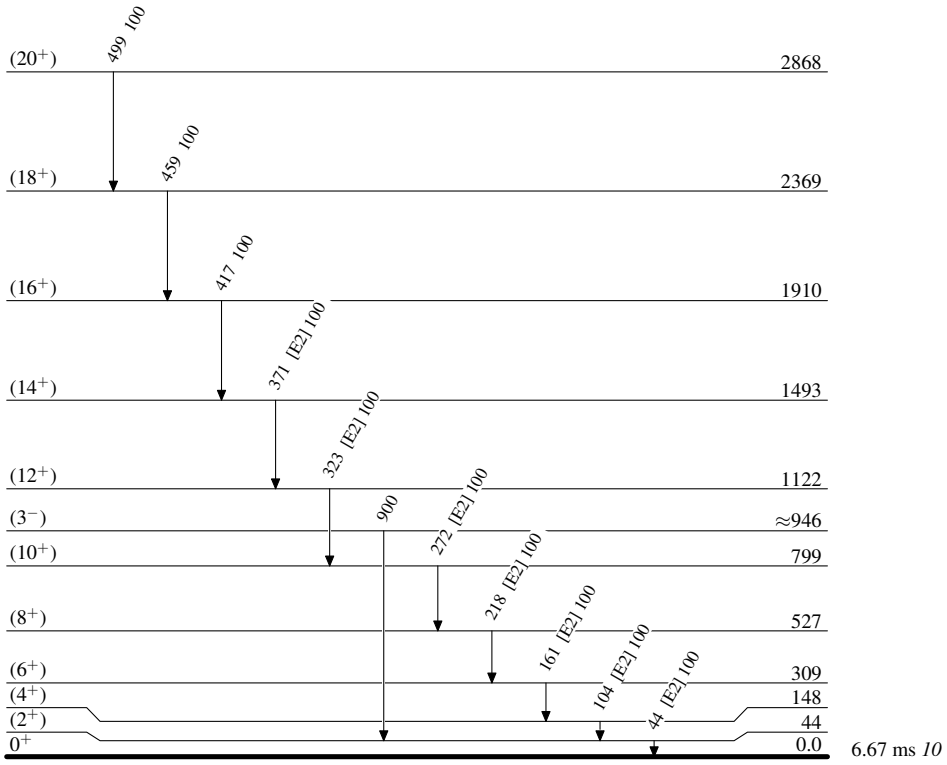
Adopted Levels, Gammas

Legend

Level Scheme

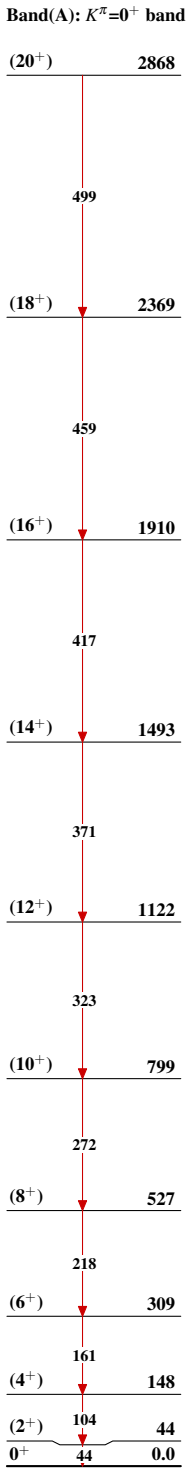
Intensities: Relative photon branching from each level

– – – – – – ► γ Decay (Uncertain)



$^{256}_{104}Rf_{152}$

Adopted Levels, Gammas



$^{256}_{104}Rf_{152}$