Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	M. J. Martin	NDS 122, 377 (2014)	1-Sep-2014

Q(β^-)=841 *SY*; S(n)=5481 *SY*; S(p)=4743 *SY*; Q(α)=5775 *SY* 2012Wa38
The systematics uncertainty is 71 keV for all four entries.

^{248}Bk Levels

Cross Reference (XREF) Flags

A ^{252}Es α decay

E(level)	J^π	$T_{1/2}$	XREF	Comments
0.0+z	(6^+,8^-)	>9 y		Assignment: ^{246}Cm(α,pn) chem, ms (1965Mi08). J^π: the odd proton may be in the 7/2[633] Nilsson state in analogy to ^{249}Bk, and the odd neutron in the 9/2[734] state in analogy to ^{247}Cm and ^{249}Cf. The Gallagher-Moszkowski rule predicts the parallel coupled 8^- state to be lower in energy than the 1^- member of the doublet. The long-lived state might be the 8^- member of this doublet. However, it is also possible that this may be the (6^+) level At E=0.0+Y fed In α decay of ^{252}Es rather than the 8^- level proposed by 1973Fi06. An assignment of either 6^+ or 8^- is consistent with the absence of any β^- decay to ^{248}Cf. $T_{1/2}$: deduced by 1965Mi08 from observation of no change in ^{248}Bk/^{247}Bk mass ratio of their sample for a period of ten months within the limits of analysis. $T_{1/2}(\beta^-)>1\times10^4$ y was deduced by 1965Mi08 from nonobservation of ^{248}Cf α activities.
0.0+x	$1^{(-)}$	23.7 h *2*		%β^-=70 *5*; %ε=30 *5* The ratio of ε decay/β^- decay was determined by 1978Gr10 from measured I(Curium K x ray from ε decay)/I(550.7γ from β^- decay)= 4.25 *28* and I(550.7γ)=7.1 *5* per 100 β^- decays. E(level): Q(β^-)=860 *20* measured by 1978Gr10, compared with the systematics value of 841 *71* from 2012Wa38, suggests that E(level)=20 *+74−20*. $T_{1/2}$: from 1978Gr10. Others: 16 h *3* (1956Ch77), and 23 h *5* (1956Hu27). J^π: log *ft*=7.6 to 2^+ and 7.1 to 0^+ In ε decay (7.6 to 2^+ and 7.8 to 0^+ In β^- decay) give J=1. Probable configuration of π7/2[633]⊗ν9/2[734] gives π=−.
0.0+y†	(6^+)		A	E(level): Q(α)(^{252}Es)=6739 *3* from Eα=6632 *3*, and Q(α)=6789 *50* from systematics As given In 2012Wa38, suggest that this level lies within 100 keV of the g.s.. J^π: from the ratio of energy spacings, K=6 was assigned by 1973Fi06 for the rotational band based on this level, and a π3/2[521]⊗ν9/2[734] configuration was proposed. The α hindrance factor for the α transition from ^{252}Es is consistent with this configuration.
70.65+y† *5*	(7^+)		A	J^π: E2 γ to 6^+. Member of the $K^\pi=6^+$ band. The α hindrance factor is consistent with this assignment.
136+y *7*	(8^-)		A	J^π: E1 γ to (7^+). No γ to (6^+). J^π: 1973Fi06 suggest the configuration $K^\pi=8^-$, π7/2[633]⊗ν9/2[734]; however, this configuration is not consistent with the α hindrance factor of 2710. The transition would require changes in both the neutron and proton orbitals, and hindrance factors for such transitions are typically much larger.
145+y *3*			A	
151.3+y† *1*	(8^+)		A	J^π: γ's to (6^+) and (7^+). Member of the $K^\pi=6^+$ band. The α hindrance factor is consistent with this assignment.
171.5+y *8*	(4^-,5^-,6^-)		A	J^π: 418.5γ from (5^-) state is M1. The authors of 1973Fi06 propose $J^\pi=4^-$. Although a probable configuration of K=4, π3/2[521]⊗ν5/2[622] is consistent

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Adopted Levels, Gammas (continued)

^{248}Bk Levels (continued)

E(level)	J^π	XREF	Comments
			with the M1 transition from the 5^-, $\pi 3/2[521]\otimes\nu 7/2[613]$ state, the hindrance factor for the α from ^{252}Es is not. One would expect the HF to be about a factor of hundred less than the experimental value of 2250.
179+y *3*		A	
212.6+y *8*	$(4^-,5^-,6^-)$	A	J^π: 377.4γ from (5^-) state is M1. The authors of 1973Fi06 propose that it may be the $J^\pi=5^-$ member of a band based on the 171.5+Y level.
262+y *6*		A	
339+y *6*		A	
373+y *5*		A	
399.7+y *3*	(5^+)	A	J^π: M1 γ to (6^+) but not to (7^+) or (8^+) members of the proposed $K^\pi=6^+$ band.
424+y *6*		A	
458+y *6*		A	
483+y *6*		A	
529.1+y *7*		A	
590.0+y‡ *7*	(5^-)	A	J^π: HF=5.1 from (5^-) suggests probable configuration $\pi 3/2[521]\otimes\nu 7/2[613]$, the same as that of the ^{252}Es g.s.
624+y# *5*	(7^+)	A	J^π: A $K^\pi=7^+$, $\pi 7/2[633]\otimes\nu 7/2[613]$ configuration is suggested by 1973Fi06. The α hindrance factor is consistent with this assignment.
657+y‡ *5*	(6^-)	A	J^π: The energy spacing and the α hindrance factor suggest that the level is the 6^- member of the $K^\pi=5^-$ band built on the 590.0+Y level.
700+y# *5*	(8^+)	A	J^π: The energy spacing and the α hindrance factor suggest that the level is the 8^+ member of a rotational band built on the 624+Y level.

† Band(A): $K^\pi=6^+$, $\pi 3/2[521]\otimes\nu 9/2[734]$ band.
‡ Band(B): $K^\pi=5^-$, $\pi 3/2[521]\otimes\nu 7/2[613]$ band.
# Band(C): $K^\pi=7^+$, $\pi 7/2[633]\otimes\nu 7/2[613]$ band.

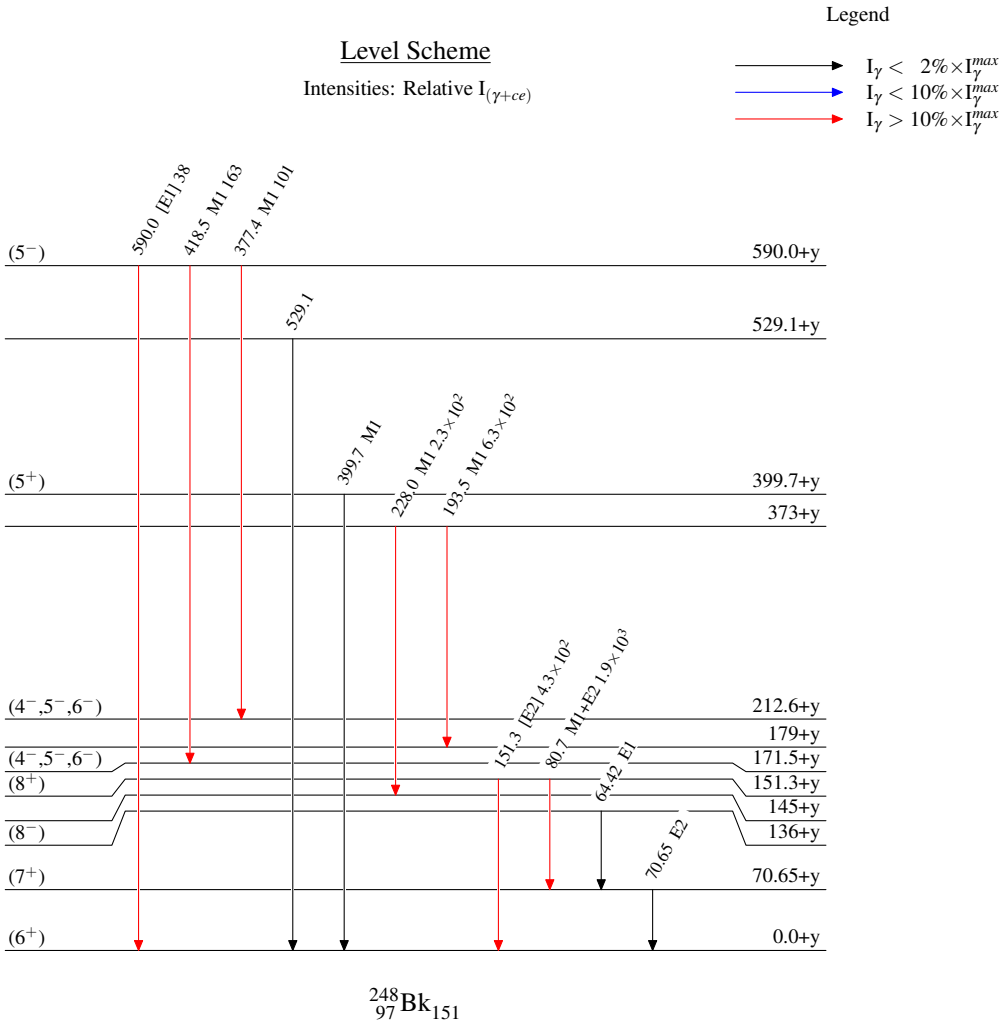
$\gamma(^{248}$Bk)

All data are from ^{252}Es α decay.

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	δ	α†
70.65+y	(7^+)	70.65 *5*		0.0+y	(6^+)	E2		104.5 *15*
136+y	(8^-)	64.42 *5*		70.65+y	(7^+)	E1		0.450 *7*
151.3+y	(8^+)	80.7 *1*	44 *8*	70.65+y	(7^+)	M1+E2	1.4 *+14−4*	43 *8*
		151.3 *1*	100 *10*	0.0+y	(6^+)	[E2]		3.26 *5*
373+y		193.5 *1*	100 *12*	179+y		M1		5.33 *8*
		228.0 *4*	53 *9*	145+y		M1		3.36 *5*
399.7+y	(5^+)	399.7 *3*		0.0+y	(6^+)	M1		0.709 *10*
529.1+y		529.1 *7*		0.0+y	(6^+)			
590.0+y	(5^-)	377.4 *3*	55 *7*	212.6+y	$(4^-,5^-,6^-)$	M1		0.830 *12*
		418.5 *3*	100 *10*	171.5+y	$(4^-,5^-,6^-)$	M1		0.625 *9*
		590.0 *7*	38 *4*	0.0+y	(6^+)	[E1]		0.0116 *2*

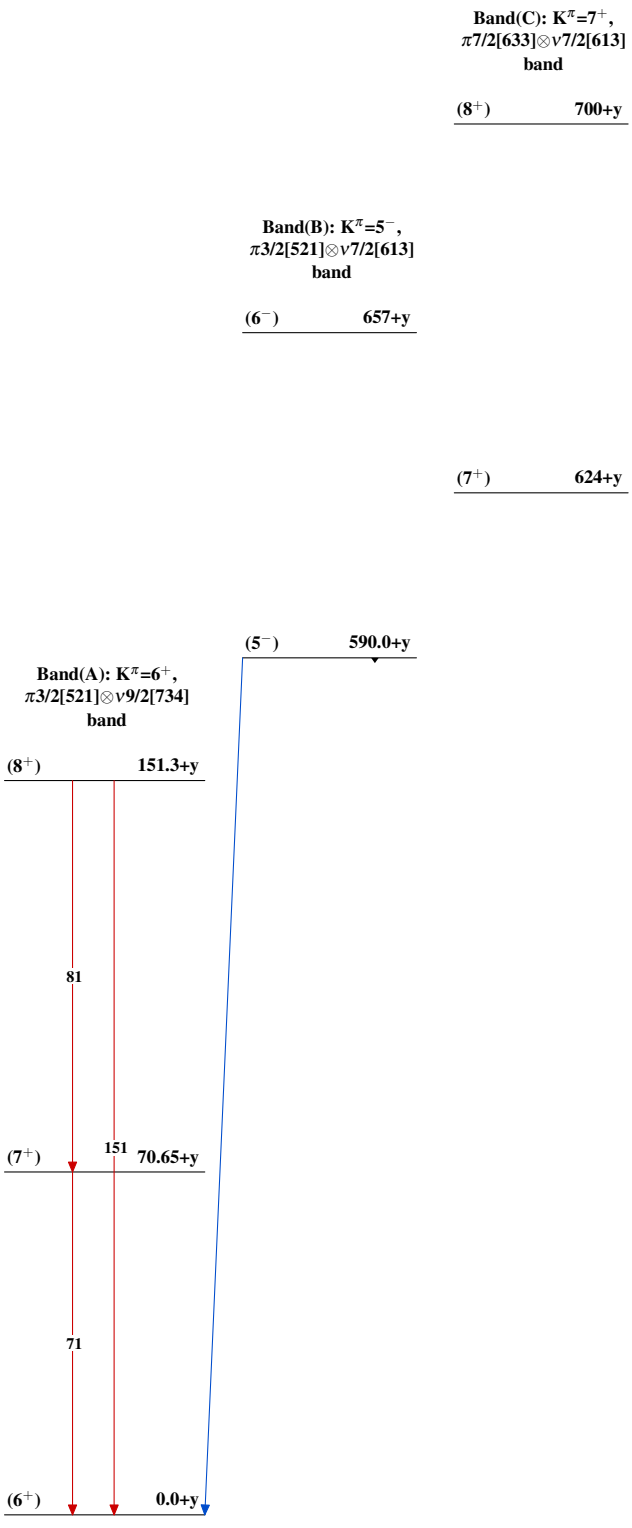
† Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

Adopted Levels, Gammas



$^{248}_{97}Bk_{151}$

Adopted Levels, Gammas



$^{248}_{97}Bk_{151}$