^{252}Es α decay **1973Fi06**

History

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

Parent: ^{252}Es: E=0.0; J$^{\pi}$=(5^{-}); T$_{1/2}$=471.7 d *19*; Q(α)=6739 *3*; %α decay=78 *2*
^{252}Es-Q(α): From Eα=6632 *3*. 2012Wa38 report a systematics value of 6789 *50*.

^{248}Bk Levels

E(level)	J$^{\pi}$	Comments
0.0+y	(6^{+})	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..
70.65+y *5*	(7^{+})	
136+y *7*	(8^{-})	
145+y *3*		
151.3+y *1*	(8^{+})	
171.5+y *8*	(4^{-},5^{-},6^{-})	
179+y *3*		
212.6+y *8*	(4^{-},5^{-},6^{-})	
262+y *6*		
339+y *6*		
373+y *5*		
399.7+y *3*	(5^{+})	
424+y *6*		
458+y *6*		
483+y *6*		
529.1+y *7*		
590.0+y *7*	(5^{-})	
624+y *5*	(7^{+})	
657+y *5*	(6^{-})	
700+y *5*	(8^{+})	

α radiations

Eα†	E(level)	I$\alpha$$^{\ddagger @}$	HF$^{\#}$	Comments
5943 *4*	700+y	0.040 *15*	34 *13*	
5985 *4*	657+y	0.050 *15*	46 *14*	
6017 *4*	624+y	0.12 *3*	28 *8*	
6051 *3*	590.0+y	1.02 *9*	5.0 *5*	
6109 *5*	529.1+y	0.12 *3*	86 *22*	
6156 *5*	483+y	≈0.04	≈449	
6181 *5*	458+y	0.08 *3*	3.0×10^{2} *12*	
6215 *5*	424+y	0.10 *3*	3.6×10^{2} *11*	
6239 *3*	399.7+y	0.57 *5*	83 *8*	
6265 *3*	373+y	0.75 *7*	85 *9*	
6298 *5*	339+y	≈0.04	≈2306	
6374 *5*	262+y	0.07 *3*	3.1×10^{3} *14*	
6424 *5*	212.6+y	0.45 *5*	8.4×10^{2} *10*	
6461 *3*	171.5+y	0.25 *4*	2.25×10^{3} *37*	
6482 *3*	151.3+y	2.19 *9*	323 *17*	
6498 *5*	136+y	0.31 *4*	2.71×10^{3} *37*	
6562 *3*	70.65+y	13.6 *3*	123 *5*	
6632 *3*	0.0+y	80.2 *9*	43.5 *14*	The 6632- and 6562-keV α's are not seen in coincidence with 80^{-} to 400-keV γ's within the coincidence resolving time of 100 ns (1973Fi06).

Continued on next page (footnotes at end of table)

^{252}Es α decay 1973Fi06 (continued)

α radiations (continued)

† Measurements of 1973Fi06. The original energies are increased by 1 keV, as recommended by 1991Ry01, due to changes in calibration energies. No higher-energy α's were observed and 1973Fi06 assumed that the 6632α feeds the ^{248}Bk g.s. other: 1965Mc11.
‡ Iα per 100 α decays (1973Fi06).
# $r_0(^{248}Bk)$=1.4851 *7* is used in calculations of the hindrance factors. r_0=1.4851 *14* was used In the previous evaluation, 1999Ak02.
@ For absolute intensity per 100 decays, multiply by 0.78 *2*.

γ(^{248}Bk)

$\alpha\gamma$, $\gamma\gamma$ and γce coincidences were taken by 1973Fi06. See 1973Fi06 for data.

x-rays measured by 1973Fi06:

E(x ray)	I(per 100 α decays)		
107.20 *5*	0.37 *3*	Bk Kα_2	x ray
115.02 *5*	0.58 *5*	Bk Kα_1	x ray
125.4 *1*		Bk Kβ_3	x ray
	0.23 *2*		
126.5 *1*		Bk Kβ_1	x ray
130.7 *2*	0.082 *8*	Bk Kβ_2'	x ray

E_γ[‡]	I_γ[#&]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[@]	δ	α[†]	Comments
^{x}52.33 *5*	0.72 *6*								The 52.33γ was observed in coincidence with the 6461α; therefore, it deexcites a level below the 171.5+Y level.
64.42 *5*	0.36 *3*	136+y	(8$^-$)	70.65+y	(7$^+$)	E1		0.450	α(L)=0.336 *5*; α(M)=0.0843 *12* α(N)=0.0229 *4*; α(O)=0.00559 *8*; α(P)=0.000920 *13*; α(Q)=3.14$\times10^{-5}$ *5* Mult.: the requirement of an intensity balance At the 151.3+Y level is consistent only with mult=E1.
70.65 *5*	0.16 *2*	70.65+y	(7$^+$)	0.0+y	(6$^+$)	E2		104.5	α(L)=75.4 *11*; α(M)=21.4 *3* α(N)=5.99 *9*; α(O)=1.466 *22*; α(P)=0.242 *4*; α(Q)=0.000794 *12* Mult.: from an intensity balance At the 70.65+Y level one gets α=99 +*15*−*12*.
80.7 *1*	0.042 *7*	151.3+y	(8$^+$)	70.65+y	(7$^+$)	M1+E2	1.4 +*14*−*4*	42 *10*	α(L)=30 *7*; α(M)=8.4 *20* α(N)=2.4 *6*; α(O)=0.58 *14*; α(P)=0.098 *21*; α(Q)=0.0012 *5* Mult.,δ: the requirement of an intensity balance At the 151.3+Y level gives α(80.7γ)=42 +*9*−*7* from which one gets mult(80.7γ)=M1+E2 with δ=1.4 +*14*−*7*.
^{x}149.1 *2*	0.026 *4*								
151.3 *1*	0.096 *9*	151.3+y	(8$^+$)	0.0+y	(6$^+$)	[E2]		3.26	α(K)=0.1614 *23*; α(L)=2.23 *4*; α(M)=0.633 *9* α(N)=0.177 *3*; α(O)=0.0435 *7*; α(P)=0.00732 *11*; α(Q)=4.63$\times10^{-5}$ *7*
193.5 *1*	0.068 *8*	373+y		179+y		M1		5.33	α(K)=4.17 *6*; α(L)=0.869 *13*; α(M)=0.213 *3* α(N)=0.0587 *9*; α(O)=0.01512 *22*; α(P)=0.00298 *5*; α(Q)=0.000209 *3*
228.0 *4*	0.036 *6*	373+y		145+y		M1		3.36	α(K)=2.63 *4*; α(L)=0.547 *9*; α(M)=0.1339 *20* α(N)=0.0369 *6*; α(O)=0.00950 *15*; α(P)=0.00188 *3*; α(Q)=0.0001313 *20*
^{x}230.9 *4*	0.032 *6*								
^{x}326.0 *4*	0.031 *6*								

^{252}Es α decay **1973Fi06 (continued)**

γ(^{248}Bk) (continued)

E_γ[‡]	I_γ[#&]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[@]	α[†]	Comments
377.4 *3*	0.16 *2*	590.0+y	(5$^-$)	212.6+y	(4$^-$,5$^-$,6$^-$)	M1	0.830	α(K)=0.651 *10*; α(L)=0.1341 *19*; α(M)=0.0328 *5* α(N)=0.00905 *13*; α(O)=0.00233 *4*; α(P)=0.000459 *7*; α(Q)=3.21×10^{-5} *5*
399.7 *3*	0.30 *3*	399.7+y	(5$^+$)	0.0+y	(6$^+$)	M1	0.709	α(K)=0.556 *8*; α(L)=0.1145 *17*; α(M)=0.0280 *4* α(N)=0.00772 *11*; α(O)=0.00199 *3*; α(P)=0.000392 *6*; α(Q)=2.74×10^{-5} *4*
418.5 *3*	0.29 *3*	590.0+y	(5$^-$)	171.5+y	(4$^-$,5$^-$,6$^-$)	M1	0.625	α(K)=0.491 *7*; α(L)=0.1009 *15*; α(M)=0.0247 *4* α(N)=0.00680 *10*; α(O)=0.001751 *25*; α(P)=0.000345 *5*; α(Q)=2.41×10^{-5} *4*
^{x}428.3 *5*	≈0.012							
^{x}452.4 *5*	0.04 *1*							
^{x}523 *1*	≈0.016							
529.1 *7*	0.07 *1*	529.1+y		0.0+y	(6$^+$)			
^{x}≈548	≈0.01							
590.0 *7*	0.11 *1*	590.0+y	(5$^-$)	0.0+y	(6$^+$)	[E1]	0.01161	α(K)=0.00929 *14*; α(L)=0.001750 *25*; α(M)=0.000423 *6* α(N)=0.0001160 *17*; α(O)=2.95×10^{-5} *5*; α(P)=5.67×10^{-6} *8*; α(Q)=3.55×10^{-7} *5*

† Additional information 1.

‡ From 1973Fi06.

\# Iγ per 100 α decays (1973Fi06).

@ Except where noted otherwise, mults are from K x ray/γ In coincidence with α's (1973Fi06) (E2 admixtures to M1′s are not ruled out). The multipolarities within square brackets are not directly measured but are deduced from the decay scheme.

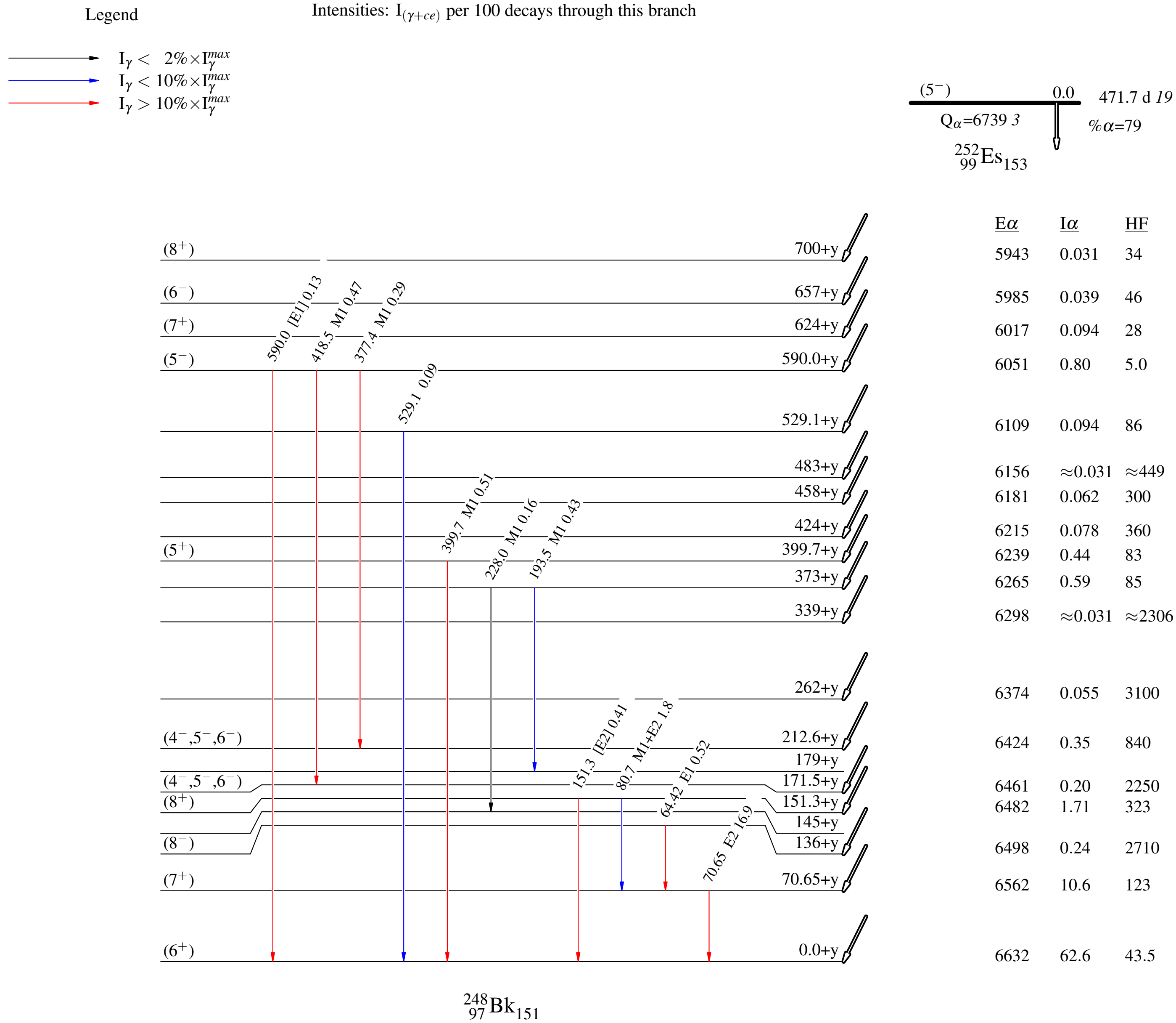
& For absolute intensity per 100 decays, multiply by 0.78 *2*.

^{x} γ ray not placed in level scheme.

$^{248}_{97}Bk_{151}$-4

^{252}Es α decay 1973Fi06

Decay Scheme



Eα	Iα	HF
5943	0.031	34
5985	0.039	46
6017	0.094	28
6051	0.80	5.0
6109	0.094	86
6156	≈0.031	≈449
6181	0.062	300
6215	0.078	360
6239	0.44	83
6265	0.59	85
6298	≈0.031	≈2306
6374	0.055	3100
6424	0.35	840
6461	0.20	2250
6482	1.71	323
6498	0.24	2710
6562	10.6	123
6632	62.6	43.5