^{248}Bk ε decay 1978Gr10

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	C. D. Nesaraja	NDS 204,374 (2025)	30-Jun-2024

Parent: ^{248}Bk: E=0.0+x; J$^{\pi}$=1$^{(-)}$; $T_{1/2}$=23.7 h *2*; Q(ε)=740 *50*; %ε decay=30 *5*

^{248}Bk-Q(ε): From 2021Wa16.

^{248}Bk-Q(ε)= 705 keV *22* deduced by 1978Gr10 from closed cycle with Q(β^-)=860 *20* and mass difference (^{248}Cm -^{248}Cf)= 154 *10*. Using the same approach of the closed cycle, but with values from 2021Wa16, the evaluator deduced Q(ε)= 735 *50* from Q(β^-)= 890 *50* for the 23.7-h ^{248}Bk (2021Wa16) and mass difference (^{248}Cm -^{248}Cf)= 155 *6* (2021Wa16).

^{248}Bk-%ε decay: From 1978Gr10.

1978Gr10: Gammas were measured with a Ge(Li) detector and two NaI(Tl) detectors were used to detect coincident conversion electrons and Cm X-rays emitted in electron-capture decay. Measured Iε. Deduced Qε, branching ratio.

No γ's were observed in ^{248}Bk ε decay. Since Q(ε)=740 for ^{248}Bk decay, no known low-spin states other than the g.s. and 43.40-keV level are expected to be populated in the ε decay of low-spin ^{248}Bk; nonobservation of any photons is consistent with 23.7-h ^{248}Bk being a low spin parent.

^{248}Cm Levels

E(level)	J$^{\pi}$ †	$T_{1/2}$ †
0.0	0$^+$	3.48×10^5 y *6*
43.399 *25*	2$^+$	122.5 ps *25*

† From Adopted Levels.

ε radiations

εK, εL, εM, εN: Additional information 1.

E(decay)	E(level)	Iε †‡	Log *ft*	Comments
(7.0×10^2 *5*)	43.399	7 *2*	7.80 *16*	εK=0.713 *7*; εL=0.2080 *45*; εM+=0.0794 *17* Iε: 22 % *5* of the branching ratio.
(7.4×10^2 *5*)	0.0	23 *6*	7.31 *14*	εK=0.717 *6*; εL=0.2048 *39*; εM+=0.0779 *15*

† 1978Gr10 deduced intensity of the ε branch to the 43.4-keV level to be 18 *2* and 35 *10* per 100 ε decays from their measured (L x ray)(L x ray) and (K$_\beta$ x ray)(L x ray) coincidence intensities, respectively. The weighted average of 22 *5* per 100 ε decays was suggested by 1978Gr10 for the ε decay intensity to the 2$^+$ state.

‡ Absolute intensity per 100 decays.

γ(^{248}Cm)

x-rays measured by 1978Gr10:

E(x ray)	I(per 100 ε decays)		
104.6 *1*	65 *3*	Cm Kα_2	x ray
109.3 *5*	100 (norm.)	Cm Kα_1	x ray
123.2 *2*	39.0 *30*	Cm Kβ_1	x ray
127.1 *2*	13.0 *16*	Cm Kβ_2	x ray

Continued on next page (footnotes at end of table)

^{248}Bk ε decay 1978Gr10 (continued)

$\gamma(^{248}Cm)$ (continued)

E_γ	E_i(level)	J^π_i	E_f	J^π_f	Mult.	α †	$I_{(\gamma+ce)}$ ‡	Comments
(43.399 *25*)	43.399	2^+	0.0	0^+	E2	1000 *14*	22 *5*	α(L)=724 *10*; α(M)=203.9 *29* α(N)=56.7 *8*; α(O)=13.70 *20*; α(P)=2.238 *32*; α(Q)=0.00553 *8* E_γ,Mult.: From Adopted Gammas. This transition has not been seen in 23.7-h ^{248}Bk ε decay. I_γ,$I_{(\gamma+ce)}$: an intensity balance at the g.s. yields I(γ+ce)=22 *5* and Iγ=0.022 *5* per 100 ε decays.

† Additional information 2.
‡ For absolute intensity per 100 decays, multiply by 0.30 *5*.

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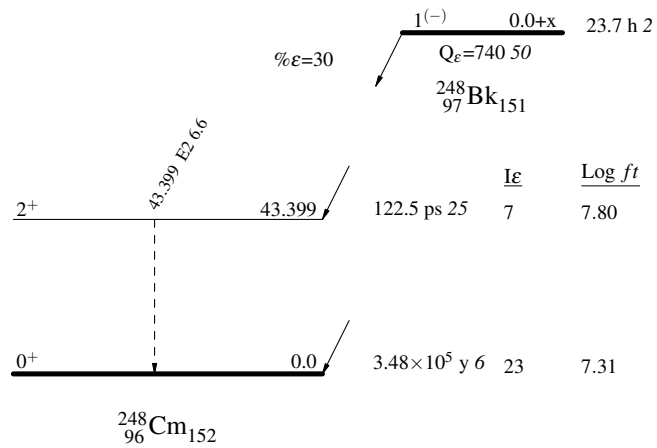
Legend

- - - - - - ► γ Decay (Uncertain)

Decay Scheme