Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	NDS 156, 1 (2019)	31-Jan-2019

Q(β^-)=−2550 *SY*; S(n)=6514 *4*; S(p)=5396.7 *23*; Q(α)=7307.5 *19* 2017Wa10
Estimated $\Delta Q(\beta^-)$=100 (2017Wa10).
S(2n)=12055 *6*, S(2p)=9710 *3* (2017Wa10).
Both the known activities of ^{254}Md decay almost 100% by β^+,ε decays, but no experimental data are available to elucidate the level structure in ^{254}Fm. Based on particle plus rotor model phenomenological calculations, 2017So07 analyzed $\beta^+ + \varepsilon$ decays of the 10-min and 28-min activities of ^{254}Md to ^{254}Fm, and concluded that 10-min activity, assigned as $\pi 1/2[521] \otimes \nu 1/2[620]$, $K^\pi=0^-$, $J^\pi=1^-$ is the ground state, and the 28-min activity, assigned as $\pi 7/2[514] \otimes \nu 1/2[620]$, $K^\pi=3^-$, is a $J^\pi=3^-$ isomer lying within a few keV of the 10-min ground state. The authors further estimated decays to the excited states in ^{254}Fm, and surmised that the 10-min, 1^- ground state would populate the known g.s. and the first 2^+ state in ^{254}Fm, and the 28-min 3^- isomer would feed the known 2^+ and 3^+ members of the gamma-vibrational band at 694 and 793, respectively.
Theoretical studies: consult the NSR database at www.nndc.bnl.gov for 172 references dealing with theoretical calculations of half-lives for different decay modes, binding energies, fission characteristics, and other nuclear structure aspects.
Additional information 1.

^{254}Fm Levels

Cross Reference (XREF) Flags

A ^{254}Es β^- decay (275.7 d)
B ^{254}Es β^- decay (39.3 h)

E(level)	J^π†	$T_{1/2}$	XREF	Comments
0.0‡	0^+	3.240 h *2*	B	%α=99.9408 *3*; %SF=0.0592 *3* %α/%SF=1689 *8*, weighted average of 1695 *8* and 1664 *17*, measured by 1967Fi03. Other measurements: 1956Jo09. $T_{1/2}$: measurement by 1967Fi03. Earlier measurements: 3.24 h *1* (1956Jo09), 3.2 h (1954Ch23).
44.992‡ *10*	2^+		B	J^π: 44.99γ, E2 to 0^+.
149.349‡ *16*	4^+		B	J^π: 104.35γ, E2 to 2^+.
693.66# *4*	2^+		B	J^π: 693.67γ, E2 to 0^+ g.s.
733.54# *4*	3^+		B	J^π: 584.18γ and 688.68γ, E2(+M1) to 4^+ and 2^+, respectively; β feeding from 2^+ parent rules out 4^+, and 2^+ is less likely from absence of γ to 0^+; gamma-vibrational band member.

† From band assignments, and other supporting comments as given.
‡ Band(A): Ground-state band.
# Band(B): $K^\pi=2^+$ γ-vibrational band.

$\gamma(^{254}Fm)$

E_i(level)	J_i^π	E_γ†	I_γ†	E_f	J_f^π	Mult.†	δ†	α‡
44.992	2^+	44.992 *10*	100	0.0	0^+	E2		1172
149.349	4^+	104.356 *12*	100	44.992	2^+	E2		21.7
693.66	2^+	544.28 *10*	3.1 *3*	149.349	4^+	E2		0.0612
		648.69 *7*	100 *7*	44.992	2^+	E2(+M1)	>9	0.0427 *13*

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

$\gamma(^{254}Fm)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[†]	δ[†]	α[‡]
693.66	2^+	693.67 *7*	86 *6*	0.0	0^+	E2		0.0359
733.54	3^+	39.881 *10*		693.66	2^+	(E2)		2.10×10^3
		584.18 *10*	23.2 *16*	149.349	4^+	E2(+M1)	>9	0.0538 *17*
		688.68 *2*	100 *7*	44.992	2^+	E2(+M1)	>8	0.0378 *13*

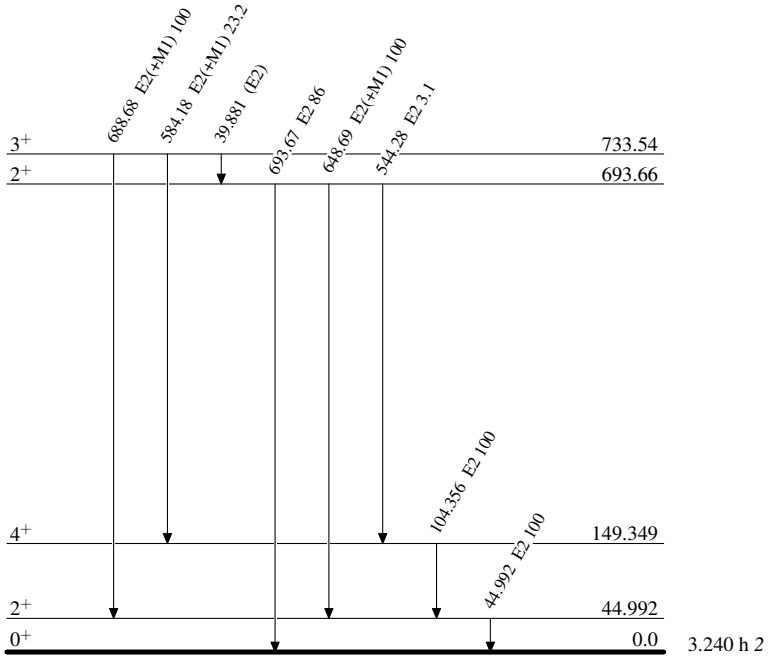
[†] From 39.3-h ^{254}Es β^- decay.

[‡] 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

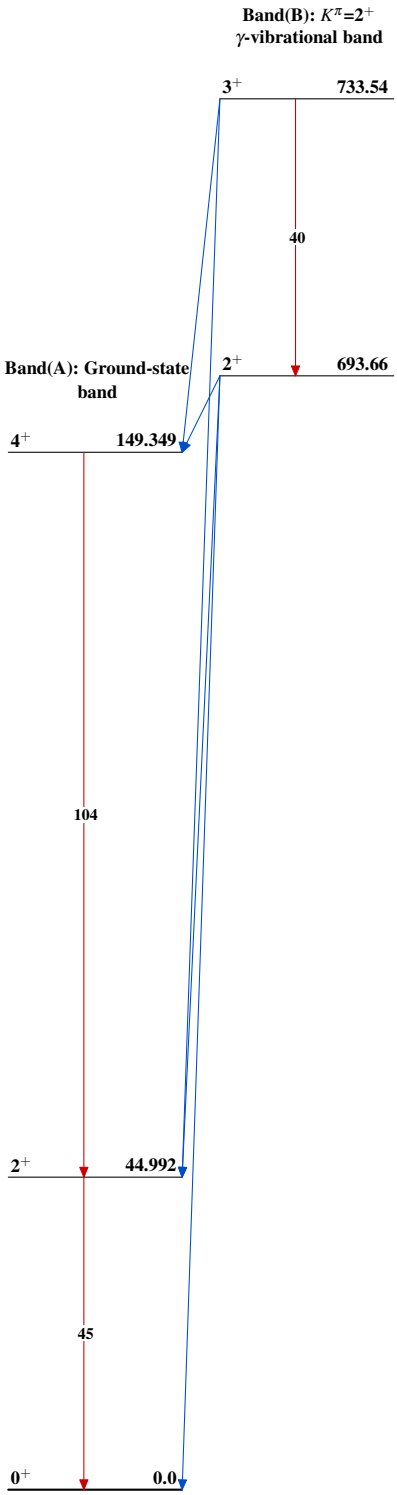
Level Scheme

Intensities: Relative photon branching from each level



$^{254}_{100}Fm_{154}$

Adopted Levels, Gammas



$^{254}_{100}Fm_{154}$