

Adopted Levels, Gammas

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	E. Browne, J. K. Tuli		NDS 114, 1041 (2013)	1-Mar-2012

$Q(\beta^-) = -1826$ SY; S(n)=5540 6; S(p)=5235 50; $Q(\alpha) = 7198$ 3 [2012Wa38](#)

Estimated $\Delta Q(\beta^-) = 30$ ([2012Wa38](#)).

Calculations, compilations:

α decay: [1993Bu09](#), [1992Bu03](#).

Binding energies: [1997Pa22](#).

Deformation parameters: [1997Pa22](#), [2003Ga34](#).

g.s. properties: [1997Mo25](#), [1995Mo29](#), [2005Pa73](#).

Heavy ion emission: [1985Po11](#).

[2005Re16](#): Predicted SF half-life = 6.1×10^3 y.

Single-particle Nilsson levels: [1994Cw02](#), [2005Pa73](#).

[1994Cw02](#) have calculated the following single-particle level sequence: g.s., 1/2[620]; 0.11 MeV, 3/2[622]; 0.24 MeV, 7/2[613]; 0.33 MeV, 11/2[725]; 0.38 MeV, 9/2[734]; 0.75 MeV, 9/2[615].

[2005Pa73](#) have calculated the following single-particle level sequence: g.s., 1/2[620]; 0.07 MeV, 3/2[622]; 0.25 MeV, 11/2[725]; 0.26 MeV, 7/2[613]; 0.39 MeV, 9/2[734].

²⁵³Fm Levels

Cross Reference (XREF) Flags

- A ²⁵⁷No α decay
- B ²⁵³Md ϵ decay

E(level)	J ^{π}	T _{1/2}	XREF	Comments
0.0 [†]	1/2 ⁺	3.00 d 12	AB	% α =12 1; % ϵ =88 1 (1967Ah02) T _{1/2} : from 1967Ah02 . Other: 3.0 d 2 (1959Si88).
22.3 [†] 1	(3/2 ⁺)		AB	XREF: B(?).
47.1 [†] 2	(5/2 ⁺)		AB	XREF: B(?).
124.1 [‡] 1	3/2 ⁺		AB	J ^{π} : favored α decay from 3/2[622] state, hence same configuration expected here.
x [#]	7/2 ⁺		B	E(level): x \approx 130-150 (estimated by 2011An13). J ^{π} : Configuration= ν 7/2[613] from syst of N=153 (2010St14).
158.7 [‡] 2	(5/2 ⁺)		AB	XREF: B(?).
60+x [#]	9/2 ⁺		B	
135+x [#]	11/2 ⁺		B	
211+x	11/2 ⁻	0.56 μ s 6	B	T _{1/2} : obtained by fitting the (ce) γ coin decay curve by an exponential function (2011An13). Other: 0.5 μ s 3 (2010St14). J ^{π} : Configuration= ν 11/2[725] from syst of N=153 (2010St14).
398+x	9/2 ⁺		B	Configuration= ν 9/2[615].

[†] Band(A): Band 1/2⁺[620].

[‡] Band(B): Band 3/2⁺[622] (tentative).

[#] Band(C): 7/2⁺[613].

Adopted Levels, Gammas (continued)

$\gamma(^{253}\text{Fm})$								
$E_i(\text{level})$	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	α^\dagger	Comments
22.3	(3/2 ⁺)	22.3 \ddagger		0.0	1/2 ⁺			
47.1	(5/2 ⁺)	24.8 \ddagger		22.3	(3/2 ⁺)			
		47.1 \ddagger		0.0	1/2 ⁺			
124.1	3/2 ⁺	77.0 2	100 8	47.1	(5/2 ⁺)	M1	22.4	$\alpha(\text{L})=16.8\ 3$; $\alpha(\text{M})=4.15\ 7$; $\alpha(\text{N}+..)=1.528\ 25$ $\alpha(\text{N})=1.159\ 19$; $\alpha(\text{O})=0.306\ 5$; $\alpha(\text{P})=0.0595\ 10$; $\alpha(\text{Q})=0.00335\ 6$
		101.8 1	57 13	22.3	(3/2 ⁺)	(M1)	9.97	$\alpha(\text{L})=7.45\ 11$; $\alpha(\text{M})=1.84\ 3$; $\alpha(\text{N}+..)=0.678\ 10$ $\alpha(\text{N})=0.514\ 8$; $\alpha(\text{O})=0.1360\ 20$; $\alpha(\text{P})=0.0264\ 4$; $\alpha(\text{Q})=0.001484\ 22$
		124.1 1	78 28	0.0	1/2 ⁺	M1	5.63	$\alpha(\text{L})=4.20\ 6$; $\alpha(\text{M})=1.039\ 15$; $\alpha(\text{N}+..)=0.383\ 6$ $\alpha(\text{N})=0.290\ 5$; $\alpha(\text{O})=0.0767\ 11$; $\alpha(\text{P})=0.01488$ 22 ; $\alpha(\text{Q})=0.000836\ 12$
158.7	(5/2 ⁺)	136.4 2	100	22.3	(3/2 ⁺)	(M1)	4.29	$\alpha(\text{L})=3.20\ 5$; $\alpha(\text{M})=0.792\ 12$; $\alpha(\text{N}+..)=0.292\ 5$ $\alpha(\text{N})=0.221\ 4$; $\alpha(\text{O})=0.0584\ 9$; $\alpha(\text{P})=0.01134$ 17 ; $\alpha(\text{Q})=0.000636\ 10$
211+x	11/2 ⁻	76.8		135+x	11/2 ⁺	(E1)	0.307	$\alpha(\text{L})=0.229\ 4$; $\alpha(\text{M})=0.0576\ 8$; $\alpha(\text{N}+..)=0.0206$ 3 $\alpha(\text{N})=0.01592\ 23$; $\alpha(\text{O})=0.00400\ 6$; $\alpha(\text{P})=0.000638\ 9$; $\alpha(\text{Q})=1.84\times 10^{-5}\ 3$ Mult.: from estimated low conversion electron intensity.
		150.5 5		60+x	9/2 ⁺	(E1)	0.215 4	From $\gamma\gamma$ coin, 76.8 γ and 150.5 γ are parallel. $\alpha(\text{K})=0.1596\ 25$; $\alpha(\text{L})=0.0417\ 7$; $\alpha(\text{M})=0.01037$ 17 ; $\alpha(\text{N}+..)=0.00374\ 6$ $\alpha(\text{N})=0.00287\ 5$; $\alpha(\text{O})=0.000735\ 12$; $\alpha(\text{P})=0.0001268\ 21$; $\alpha(\text{Q})=4.55\times 10^{-6}\ 8$ Mult.: $\alpha(\text{K})\text{exp}<0.6$ gives E1 or E2. E1 is preferred from intensity arguments. E3 is excluded from lifetime arguments.
398+x	9/2 ⁺	188.0 5		211+x	11/2 ⁻	(E1)	0.1317 20	$\alpha(\text{K})=0.0994\ 15$; $\alpha(\text{L})=0.0242\ 4$; $\alpha(\text{M})=0.00600$ 10 ; $\alpha(\text{N}+..)=0.00217\ 4$ $\alpha(\text{N})=0.00166\ 3$; $\alpha(\text{O})=0.000427\ 7$; $\alpha(\text{P})=7.51\times 10^{-5}\ 12$; $\alpha(\text{Q})=2.87\times 10^{-6}\ 5$ 188.0 γ is in coin cascade with both 76.8 γ and 150.5 γ . None of the three γ rays is in coin with 338.2 γ or 398.2 γ . Mult.: $\alpha(\text{K})\text{exp}<0.87$ gives E1 or E2. E1 is preferred from intensity arguments. E3 is excluded from lifetime arguments.
		338.2 5		60+x	9/2 ⁺			
		398.2 \ddagger		x	7/2 ⁺			

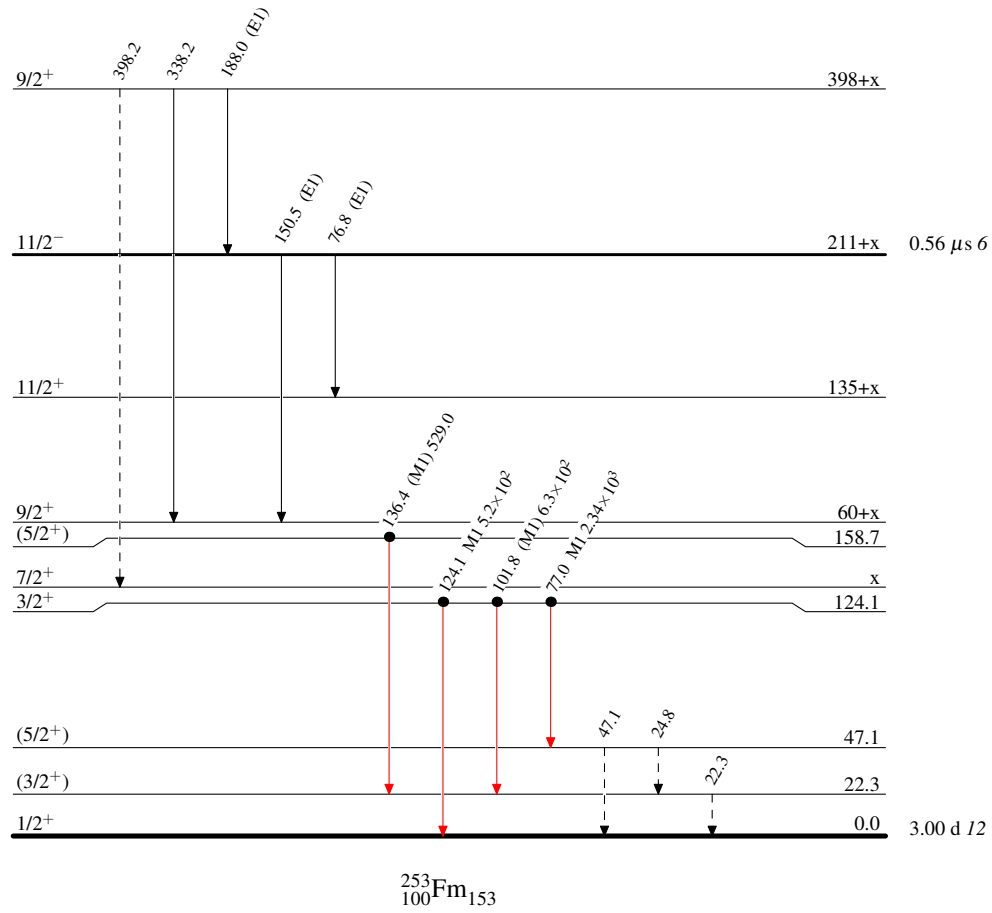
\dagger Additional information 1.

\ddagger Placement of transition in the level scheme is uncertain.

Adopted Levels, Gammas

Legend

- $I_\gamma < 2\% \times I_\gamma^{\max}$
- $I_\gamma < 10\% \times I_\gamma^{\max}$
- $I_\gamma > 10\% \times I_\gamma^{\max}$
- - - - -→ γ Decay (Uncertain)
- Coincidence

Level SchemeIntensities: Relative $I_{(\gamma+ce)}$ 

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