

Adopted Levels

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Y. Akaoli	NDS 94,131 (2001)	1-Aug-2001

$Q(\beta^-) = -4.6 \times 10^3$ syst; $S(n) = 7518$ 10; $S(p) = 4.39 \times 10^3$ syst; $Q(\alpha) = 7557$ 8 [2012Wa38](#)

Note: Current evaluation has used the following Q record -4630 syst 7610 syst 4390 syst 7557 12 [1995Au04](#).

Theoretical studies:

Energies and structures of high-K ($K=7^-$ and 8^-), low-energy (<2 MeV) states in ²⁵⁰Fm were calculated by [1991So15](#) in a quasiparticle-phonon nuclear model.

Energies of the lowest $K=0^+$ and $K=2^+$ states and the $B(E2; \text{g.s. to } 0^+)$, $B(E2; \text{g.s. to second } 2^+)$ values; energies of the $K=0^-$, 1^- , 2^- octupole-vibrational states and the $B(E3; \text{g.s. to } 3^-)$ of these vibrational states were calculated by [1971Ko31](#) and [1973Iv01](#).

Properties of the γ -vibrational states were investigated by [1965Be40](#), and $B(E2)$ values were calculated.

Equilibrium deformations and static electric moment were calculated by [1983Bo15](#).

For calculations of fission barriers, see, for example, [1976Iw02](#), [1983Ga05](#), [1984Ku05](#), [1989St20](#), [1992Bh03](#).

Partial half-life for g.s. SF decay was calculated by [1976Ra02](#), [1980Lo12](#), [1983Bo15](#), [1983Cw01](#), [1985St22](#), [1985Lo17](#), [1988Sa35](#), [1989St20](#), [1992Bh03](#) and [1996Lo08](#).

The fission barrier and the spontaneous fission half-life of the 1.8-s isomeric state were calculated by [1986Ba43](#) by considering the possible two quisparticle states with $8^-(n \ 9/2[734], n \ 7/2[624])$ and $7^-(p \ 7/2[514], p \ 7/2[633])$ configurations for the level.

For a study of heavy-cluster radioactivity and calculations of partial half-lives for such decays, as well as for α and SF decays, see [1988Sa35](#).

For calculated α decay half-lives, see [1979Po23](#), [1997Mo25](#), for example.

²⁵⁰Fm Levels

Cross Reference (XREF) Flags

- A** ²⁵⁴No α decay
B ²⁵⁰Md ε decay

E(level)	J^π	$T_{1/2}$	XREF	Comments
0.0	0^+	30 min 3	A	$\% \alpha > 90$; $\% \varepsilon < 10$; $\% \text{SF} = 0.0069$ 10 $T_{1/2}$: 30 min 3 was measured by 1957Am47 and 1966Ak01 . Other measurements: ≈ 30 min (1954At35 , 1957Am47), ≈ 33 min (1962Do11). No ε decay activity was observed: $\varepsilon/\alpha < 0.1$ (1957Am47). $\% \text{SF} = 0.0069$ 10, $T_{1/2}(\text{SF}) = 0.83$ y 15 (1989La07). Other measurement: $\% \text{SF} \approx 0.0006$ (1970Dr05).
0.0+x		1.8 s 1		$\% \text{IT} \geq 80$; $\% \alpha < 20$; $\% \varepsilon = ?$; $\% \text{SF} \leq 8.2 \times 10^{-5}$ $T_{1/2}$: measured by 1973Gh03 . Assignment: ²⁴⁹ Cf($\alpha, 3n$), parent of 30-min ²⁵⁰ Fm; ²⁴² Pu(¹² C, X), ²⁴³ Am(¹¹ B, X) and ²⁴⁹ Cf(⁴ He, x) cross-bombardment technique; not produced in ²⁴³ Am(¹² C) and in ²⁴³ Am(¹³ C) reactions (1973Gh03). IT-decay mode is inferred by 1971Gh03 from the observation of 7.44-MeV α 's of the 30-min ²⁵⁰ Fm g.s. No γ transitions have been observed deexciting this state. No evidence for decays by α emission or spontaneous fission were seen, and the upper limits for such decay modes were placed by 1973Gh03 to be of the order of 20%. Spontaneous fission branch was searched by 1989La07 , and no evidence for SF activity from the 1.8-s isomer was seen: $T_{1/2}(\text{SF}; 1.8\text{-s isomer})/T_{1/2}(\text{SF}; \text{g.s.}) \geq 0.1$ was determined, which corresponds to $T_{1/2}(\text{SF isomer}) \geq 0.07$ y, $\% \text{SF} \leq 8.2 \times 10^{-5}$ (1989La07). Possible configurations, $8^-(n \ 7/2[624], n \ 9/2[734])$ or $7^-(p \ 7/2[633], p \ 7/2[514])$, were suggested by 1973Gh03 to explain the existence of this isomeric state. The authors pointed out the existence of low-lying high-spin isomers also in the A=170-190 region. E(level): level energy is not measured. A $J^\pi = 7^-$ isomer with half-life of 70 ns was observed

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Adopted Levels (continued) ^{250}Fm Levels (continued)

<u>E(level)</u>	<u>XREF</u>	<u>Comments</u>
0.0+y	B	<p>in ^{256}Fm at 1425.5 keV. Calculations by 1991So15 for ^{250}Fm predict $7^{-}, (p7/2[633], p7/2[514])$ state at 1.7 MeV, and $8^{-}, (n9/2[734], n7/2[624])$ state at 0.8 MeV. See 1991So15 for other configurations with $K=7$, $K=8$, and their calculated level energies.</p> <p>Potential energy and partial half-lives for SF decay from the states with $8^{-}, (n9/2[734], n7/2[624])$ and the $7^{-}, (p7/2[514], p7/2[633])$ configurations were calculated by 1986Ba43; their calculations yielded $T_{1/2}(\text{SF})=1.82\times 10^5$ y and 9.77×10^8 y for the 8^{-} and 7^{-} states, respectively, and $T_{1/2}=85.1$ y for the 0^{+} ground state, which is a factor of 100 larger than the measured value.</p> <p>%SF\leq100</p> <p>Only the SF decay was observed. No other decay modes have been searched; the level was populated in ε decay of ^{250}Md (1980Ga07).</p> <p>E(level): the level is proposed as being in the second potential well. The level energy has not been determined. See 1980Ga07 for calculation and evaluation of the inner fission barrier.</p>