

^{247}Md α decay (1.2 s) [2010An08,2005He27](#)

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	C. D. Nesaraja, E. A. Mccutchan		NDS 121, 695 (2014)	30-Sep-2013

Parent: ^{247}Md : $E=0.0$; $J^\pi=(7/2^-)$; $T_{1/2}=1.2$ s I ; $Q(\alpha)=8764$ $I0$; $\% \alpha$ decay >99.9

^{247}Md - $\% \alpha$: from [2010An08](#). $\% \text{SF}$ is given as $<0.1\%$ in their Table 1, but $<1\%$ in their Figure 4.

^{247}Md - $T_{1/2}$: from evaporation residue (ER)-8416 α (t) correlations. Note that there is some inconsistency in [2010An08](#), with $T_{1/2}=1.2$ s I quoted in the text and Table 1, however, $T_{1/2}=1.3$ s I is given in Figure 2 and Figure 4.

[2010An08,2005He27](#): ^{247}Md activity produced in the $^{209}\text{Bi}(^{40}\text{Ar},2n)$ reaction with $E(^{40}\text{Ar})=187$ MeV. Evaporation residues (ER) separated with the velocity filter SHIP and implanted into a position sensitive Si strip detector. Measured $E\alpha$, $I\alpha$, $\text{ER}-\alpha$ (t), $\text{ER}-\text{SF}$ (t), $E\gamma$, $I\gamma$ using an array of position sensitive Si detectors and an HPGe detector. Earlier preliminary results given in [2006An13](#), [2004He23](#).

α : [Additional information 1](#).

 ^{243}Es Levels

E(level) [†]	J^π	$T_{1/2}$	Comments
0.0+x	(7/2 ⁺)	23 s 2	$\% \alpha=61$ 6; $\% \varepsilon+\% \beta^+=39$ 6; $\% \text{SF}<1$ (2010An08) $\% \alpha$: from the ratio of correlated ^{247}Md - ^{243}Es parent-daughter α decays and uncorrelated ^{247}Md α decays (2010An08). Other: estimation of $\% \alpha>30$ and $\% \varepsilon<70$ by 1973Es02 from intensities of α 's from ^{243}Es and ^{243}Cf decays (only strongest α 's from each nucleus were observed). $T_{1/2}$: from 7893 α (t) relative to ^{247}Md α decays (2010An08). J^π : proposed configuration 7/2[633] (2010An08). J^π : proposed configuration 7/2[633] (2010An08). J^π : proposed configuration 7/2[514] (2010An08).
x+52.1	(9/2 ⁺)		
x+209.6	(7/2 ⁻)		

[†] From [2010An08](#).

 α radiations

$E\alpha$ [†]	E(level)	$I\alpha$ ^{†#}	HF [‡]	Comments
8345 20		6 I		$E\alpha$: tentative assignment based on measured $T_{1/2}\approx 1.3$ s, in agreement with ^{247}Md ground state $T_{1/2}$. $E\alpha$: other: 8422 $I0$ in 2005He27 .
8416 10	x+209.6	92 I	≈ 0.65	
8616 20	0.0+x	2 I	≈ 131	$E\alpha$: tentative assignment based on measured $T_{1/2}\approx 1.0$ s, in agreement with ^{247}Md ground state $T_{1/2}$.

[†] From [2010An08](#).

[‡] Calculated using $r_0(^{243}\text{Es})=1.487$ 20, from $r_0(^{242}\text{Cf})=1.491$ and $r_0(^{244}\text{Fm})=1.483$, both extrapolated from r_0 's given in [1998Ak04](#).

[#] For absolute intensity per 100 decays, multiply by >0.999 .

 $\gamma(^{243}\text{Es})$

E_γ [†]	I_γ [†]	E_i (level)	J_i^π	E_f	J_f^π	Mult.	α	Comments
157.5 5	11 3	x+209.6	(7/2 ⁻)	x+52.1	(9/2 ⁺)			
209.6 3	100	x+209.6	(7/2 ⁻)	0.0+x	(7/2 ⁺)	(E1)	0.1017 16	$\alpha(K)=0.0776$ 12; $\alpha(L)=0.0180$ 3; $\alpha(M)=0.00445$ 7; $\alpha(N)=0.001229$ 18; $\alpha(O)=0.000314$ 5 $\alpha(P)=5.57\times 10^{-5}$ 8; $\alpha(Q)=2.26\times 10^{-6}$ 4 $\alpha(K)\text{exp}\leq 0.13$, $\alpha(L)\text{exp}\leq 0.04$ (2005He27). $\alpha(K)\text{exp}$ is from ratio of K x-ray and I_γ , while

Continued on next page (footnotes at end of table)

^{247}Md α decay (1.2 s) [2010An08,2005He27](#) (continued)

$\gamma(^{243}\text{Es})$ (continued)

<u>E_γ</u> [†]	<u>$E_i(\text{level})$</u>	<u>Comments</u>
$\alpha(\text{L})\text{exp}$ is estimated from energy summing between α' s and L conversion electrons. Mult.: from $\alpha(\text{K})\text{exp}$ and $\alpha(\text{L})\text{exp}$.		

[†] From [2005He27](#). I_γ are given relative to $I_\gamma(210\gamma)=100$.

^{247}Md α decay (1.2 s) 2010An08,2005He27

Decay Scheme

Legend

Intensities: Type not specified

- $\longrightarrow$ $I_\gamma < 2\% \times I_\gamma^{max}$
- $\longrightarrow$ $I_\gamma < 10\% \times I_\gamma^{max}$
- $\longrightarrow$ $I_\gamma > 10\% \times I_\gamma^{max}$

