^{256}Md ε decay (77.7 min) 2000Ah02

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	NDS 141, 327 (2017)	22-Mar-2017

Parent: ^{256}Md: E=0.0; J^π=(1$^-$); $T_{1/2}$=77.7 min *18*; Q(ε)=1970 *SY*; %ε+%$β^+$ decay=90.8 *7*

^{256}Md-J^π,$T_{1/2}$: From ^{256}Md Adopted Levels.

^{256}Md-Q(ε): 1970 *120* (syst,2017Wa10).

^{256}Md-Probable configuration=ν7/2[613]⊗π7/2[514] (2000Ah02).

2000Ah02: ^{256}Md formed in ^{253}Es(α,n),E=35-45 MeV reaction at the Argonne cyclotron facility. Target was 99.4% enriched. The recoiling Md nuclei were stopped in He gas and collected to impinge on a Pt disk. Measured Eγ, Iγ, E(x ray), I(x ray), Eα, Iα, α-γ coin using Si and Ge(Li) detectors.

The Fermium K x-ray energies and intensities were measured by 2000Ah02, 1993Mo18 and 1970Fi12 and 1993Mo18. Values from 2000Ah02 are given here.

^{256}Fm Levels

E(level)[†]	J^π[@]
0.0	0$^+$
48.09 *17*	2$^+$
159.66 *23*	4$^+$
682.16 *15*	(2$^+$)
725.36 *21*	(3$^+$)
1326.13[‡] *18*	(1$^+$)
1360.4[‡] *3*	(2$^+$)
1374.15[#] *18*	(1$^-$)
1405.22[#] *21*	(2$^-$)

† From least-squares fit to Eγ values.
‡ Proposed as member of configuration=ν7/2[613]⊗ν9/2[615] (2000Ah02).
# Proposed as member of configuration=π7/2[633]⊗π7/2[514] (2000Ah02).
@ From Adopted Levels.

ε,$β^+$ radiations

E(decay)	E(level)	I$β^+$ [#]	Iε[†#]	Log *ft*	I(ε+$β^+$)[†#]	Comments
(564 *SY*)	1405.22		5.4	6.4	5.4	εK=0.67 *4*; εL=0.24 *3*; εM+=0.093 *13*
(595 *SY*)	1374.15		10	6.2	10	εK=0.67 *4*; εL=0.235 *23*; εM+=0.090 *11*
(609 *SY*)	1360.4		4.5	6.6	4.5	εK=0.68 *3*; εL=0.233 *21*; εM+=0.090 *10*
(643 *SY*)	1326.13		13	6.2	13	εK=0.68 *3*; εL=0.229 *18*; εM+=0.088 *9*
(1287[@] *SY*)	682.16		<1.8	>7.7	<1.8	εK=0.731 *5*; εL=0.196 *3*; εM+=0.0726 *14*
(1921 *SY*)	48.09				[‡]	
(1970 *SY*)	0.0	0.12	58	6.6	58[‡]	av Eβ=455 *53*; εK=0.7436 *11*; εL=0.1861 *13*; εM+=0.0681 *6*

† From Fig. 7 in 2000Ah02, adjusted by the decay branching ratio of 90.8% *7*.
‡ Combined feeding for g.s. and 48.3 level.
# Absolute intensity per 100 decays.
@ Existence of this branch is questionable.

^{256}Md ε decay (77.7 min) 2000Ah02 (continued)

γ(^{256}Fm)

Iγ normalization: Deduced by evaluator from equating summed γ-transition intensity of 83.6 *47* from 1405 level=6% as given in Fig. 7 of 2000Ah02, which is most likely deduced from total measured x-ray intensity, as the the component from β^+ is expected to be negligible.
Fm Kα_2 x ray: E(x ray)=115.30 *8*, I(x ray)=266 *12* (2000Ah02).
Fm Kα_1 x ray: E(x ray)=121.10 *8*, I(x ray)=409 *20* (2000Ah02).
Fm Kβ_1 x ray: E(x ray)=136.0 *2*, I(x ray)=143 *10* (2000Ah02).
Fm Kβ_2 x ray: E(x ray)=140.6 *2*, I(x ray)=57 *5* (2000Ah02).

E_γ	I_γ[‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.	α[†]	$I_{(\gamma+ce)}$[‡]	Comments
(48.3 *3*)		48.09	2^+	0.0	0^+	[E2]	832		α(L)=597 *9*; α(M)=171.8 *24* α(N)=48.9 *7*; α(O)=12.31 *18*; α(P)=1.93 *3*; α(Q)=0.00466 *7*
(111.6 *2*)		159.66	4^+	48.09	2^+	[E2]	15.96	27 *5*	E_γ: from Adopted Gammas. α(L)=11.45 *16*; α(M)=3.30 *5* α(N)=0.937 *14*; α(O)=0.237 *4*; α(P)=0.0379 *6*; α(Q)=0.0001575 *22* $I_{(\gamma+ce)}$: from intensity balance at 160 level, value is in relative units on the same scale as gamma-ray intensities.
565.8 *3*	11 *2*	725.36	(3^+)	159.66	4^+	[M1,E2]	0.21 *16*		E_γ: from Adopted Gammas. α(K)=0.16 *13*; α(L)=0.039 *21*; α(M)=0.0098 *50* α(N)=0.0027 *14*; α(O)=7.2×10^{-4} *37*; α(P)=1.36×10^{-4} *74*; α(Q)=6.6×10^{-6} *50*
600.8 *4*	18 *3*	1326.13	(1^+)	725.36	(3^+)	[E2]	0.0489		α(K)=0.0285 *4*; α(L)=0.01493 *22*; α(M)=0.00400 *6* α(N)=0.001127 *16*; α(O)=0.000291 *5*; α(P)=5.18×10^{-5} *8*; α(Q)=1.442×10^{-6} *21*
634.1[@] *2*	94[@] *10*	682.16	(2^+)	48.09	2^+	[M1,E2]	0.15 *11*		α(K)=0.115 *90*; α(L)=0.028 *16*; α(M)=0.0071 *37* α(N)=0.0020 *11*; α(O)=5.2×10^{-4} *28*; α(P)=9.9×10^{-5} *55*; α(Q)=4.9×10^{-6} *37* I_γ: intensity divided by 2000Ah02 based on data in 1989Ha10 for ^{256}Es β^- decay.
634.1[@&] *2*	25[@] *10*	1360.4	(2^+)	725.36	(3^+)	[M1,E2]	0.15 *11*		α(K)=0.115 *90*; α(L)=0.028 *16*; α(M)=0.0071 *37* α(N)=0.0020 *11*; α(O)=5.2×10^{-4} *28*; α(P)=9.9×10^{-5} *55*; α(Q)=4.9×10^{-6} *37*
644.0 *2*	109 *9*	1326.13	(1^+)	682.16	(2^+)	[M1,E2]	0.15 *11*		α(K)=0.111 *86*; α(L)=0.027 *15*; α(M)=0.0068 *36* α(N)=0.00189 *99*; α(O)=5.0×10^{-4} *27*; α(P)=9.5×10^{-5} *53*; α(Q)=4.7×10^{-6} *35*
677.3[@] *2*	48[@] *4*	725.36	(3^+)	48.09	2^+	[M1,E2]	0.129 *92*		α(K)=0.097 *74*; α(L)=0.023 *13*;

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^{256}Md ε decay (77.7 min) 2000Ah02 (continued)

γ(^{256}Fm) (continued)

E_γ	I_γ[‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.	α[†]	Comments
								α(M)=0.0059 *31* α(N)=0.00164 *86*; α(O)=4.3×10^{-4} *23*; α(P)=8.2×10^{-5} *46*; α(Q)=4.1×10^{-6} *30* I_γ: intensity divided, based on data in 1989Ha10 for ^{256}Es β$^-$ decay.
677.3[@&] *2*	[@]	1360.4	(2$^+$)	682.16	(2$^+$)			E_γ: this γ ray is not included in the Adopted dataset.
680.0 *3*	23 *2*	1405.22	(2$^-$)	725.36	(3$^+$)	[E1]	0.00995	α(K)=0.00792 *12*; α(L)=0.001526 *22*; α(M)=0.000371 *6* α(N)=0.0001028 *15*; α(O)=2.69×10^{-5} *4*; α(P)=5.08×10^{-6} *8*; α(Q)=2.58×10^{-7} *4*
682.1 *2*	100	682.16	(2$^+$)	0.0	0$^+$	[E2]	0.0372	α(K)=0.0232 *4*; α(L)=0.01029 *15*; α(M)=0.00273 *4* α(N)=0.000768 *11*; α(O)=0.000199 *3*; α(P)=3.58×10^{-5} *5*; α(Q)=1.111×10^{-6} *16*
692.0 *2*	73 *6*	1374.15	(1$^-$)	682.16	(2$^+$)	[E1]	0.00965	α(K)=0.00769 *11*; α(L)=0.001477 *21*; α(M)=0.000359 *5* α(N)=9.95×10^{-5} *14*; α(O)=2.61×10^{-5} *4*; α(P)=4.92×10^{-6} *7*; α(Q)=2.50×10^{-7} *4*
723.0 *2*	27 *3*	1405.22	(2$^-$)	682.16	(2$^+$)	[E1]	0.00893	α(K)=0.00712 *10*; α(L)=0.001361 *19*; α(M)=0.000330 *5* α(N)=9.17×10^{-5} *13*; α(O)=2.40×10^{-5} *4*; α(P)=4.54×10^{-6} *7*; α(Q)=2.32×10^{-7} *4*
1200.6 *5*	14 *3*	1360.4	(2$^+$)	159.66	4$^+$	[E2]	0.01232	α(K)=0.00903 *13*; α(L)=0.00244 *4*; α(M)=0.000620 *9* α(N)=0.0001733 *25*; α(O)=4.53×10^{-5} *7*; α(P)=8.48×10^{-6} *12*; α(Q)=3.72×10^{-7} *6*; α(IPF)=2.49×10^{-6} *5*
1278.0 *3*	15 *2*	1326.13	(1$^+$)	48.09	2$^+$	[M1,E2]	0.025 *15*	α(K)=0.019 *12*; α(L)=0.0043 *22*; α(M)=0.00106 *53* α(N)=3.0×10^{-4} *15*; α(O)=7.8×10^{-5} *39*; α(P)=1.50×10^{-5} *77*; α(Q)=8.0×10^{-7} *47*; α(IPF)=2.1×10^{-5} *13*
1312.3 *3*	33 *3*	1360.4	(2$^+$)	48.09	2$^+$	[M1,E2]	0.024 *13*	α(K)=0.018 *11*; α(L)=0.0040 *20*; α(M)=9.9×10^{-4} *49* α(N)=2.8×10^{-4} *14*; α(O)=7.3×10^{-5} *36*; α(P)=1.40×10^{-5} *71*; α(Q)=7.5×10^{-7} *43*; α(IPF)=3.1×10^{-5} *18*
1326.1[#] *3*	36[#] *3*	1326.13	(1$^+$)	0.0	0$^+$	[M1]	0.0356	α(K)=0.0277 *4*; α(L)=0.00584 *9*; α(M)=0.001434 *20* α(N)=0.000400 *6*; α(O)=0.0001056 *15*; α(P)=2.05×10^{-5} *3*; α(Q)=1.144×10^{-6} *16* α(IPF)=5.51×10^{-5} *8*
1326.1[#] *3*	36[#] *3*	1374.15	(1$^-$)	48.09	2$^+$	[E1]	0.00325	α(K)=0.00258 *4*; α(L)=0.000468 *7*; α(M)=0.0001128 *16* α(N)=3.13×10^{-5} *5*; α(O)=8.24×10^{-6} *12*; α(P)=1.580×10^{-6} *23*; α(Q)=8.69×10^{-8} *13*; α(IPF)=4.71×10^{-5} *7*
1357.1 *3*	33 *3*	1405.22	(2$^-$)	48.09	2$^+$	[E1]	0.00314	α(K)=0.00248 *4*; α(L)=0.000450 *7*; α(M)=0.0001084 *16* α(N)=3.01×10^{-5} *5*; α(O)=7.92×10^{-6} *11*; α(P)=1.520×10^{-6} *22*; α(Q)=8.38×10^{-8} *12*; α(IPF)=6.06×10^{-5} *9*

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^{256}Md ε decay (77.7 min) 2000Ah02 (continued)

γ(^{256}Fm) (continued)

E_γ	I_γ[‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.	α[†]	Comments
1374.1 *3*	38 *4*	1374.15	(1⁻)	0.0	0⁺	[E1]	0.00308	α(K)=0.00243 *4*; α(L)=0.000441 *7*; α(M)=0.0001062 *15* α(N)=2.95×10^{-5} *5*; α(O)=7.75×10^{-6} *11*; α(P)=1.488×10^{-6} *21*; α(Q)=8.22×10^{-8} *12* α(IPF)=6.88×10^{-5} *10*

[†] Theoretical values from BrIcc code (2008Ki07) using "Frozen orbital" approximation, value overlaps M1 and E2, when mixing ratio is unknown.
[‡] For absolute intensity per 100 decays, multiply by 0.065 *4*.
[#] Multiply placed with undivided intensity.
[@] Multiply placed with intensity suitably divided.
[&] Placement of transition in the level scheme is uncertain.

^{256}Md ε decay (77.7 min) 2000Ah02

Decay Scheme

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided