^{140}Eu ε decay 1991Fi03

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 154, 1 (2018)	20-Nov-2018

Parent: ^{140}Eu: E=0.0; J$^{\pi}$=1^{+}; $T_{1/2}$=1.51 s *2*; Q(ε)=8470 *50*; %ε+%β^{+} decay=100.0
^{140}Eu-E,J$^{\pi}$,$T_{1/2}$: from ^{140}Eu Adopted Levels.
^{140}Eu-Q(ε): from 2017WA10.
1991Fi03: A=140 nuclei produced by ^{92}Mo(HI,xpyn) reaction with 312 MeV ^{54}Fe and 244 MeV ^{52}Cr projectiles. Measured γ, $\gamma\gamma$, γ-K x ray, deduced level scheme.
Other measurements: γ (1987Ke05,1986DeZW,1973WeZK,1972WeZE), $\gamma\gamma$, γ-K x ray (1991Fi03,1987Ke05), β endpoint (1995Ve08).
2015Sa40,2015Kl01 mainly used for Coulex data (see this dataset for description).
Decay scheme is from 1991Fi03.

^{140}Sm Levels

E(level)	J$^{\pi}$†	$T_{1/2}$	Comments
0.0	0^{+}	14.82 min *12*	%ε+%β^{+}=100 $T_{1/2}$: from Adopted Levels. %ε+%β^{+}: from Adopted Levels.
530.95 *10*	2^{+}		
990.64 *12*	2^{+}		
1246.52 *18*	4^{+}		
1420.31 *20*	(1,2)		
1599.10 *12*	0^{+}		J$^{\pi}$: from angular correlation coefficients for 1068γ-531γ cascade (2015Kl01,2015Sa40).
1628.65 *22*	0,1,2		
1933.15 *22*	0,1,2		
2284.14 *13*	2^{+}		
2289.88 *20*	(1,2)		
2482.34 *17*	(1,2)$^{+}$		
2595.9 *4*	0,1,2		

† Adopted values.

ε,β^{+} radiations

E(decay)	E(level)	Iβ^{+} †	Iε†	Log *ft*	I(ε+β^{+})†	Comments
(5.87×10^{3} *5*)	2595.9	0.80 *17*	0.13 *3*	5.49 *10*	0.93 *20*	av Eβ=2226 *24*; εK=0.115 *3*; εL=0.0164 *5*; εM+=0.00470 *13*
(5.99×10^{3} *5*)	2482.34	0.93 *14*	0.137 *21*	5.47 *7*	1.07 *16*	av Eβ=2279 *24*; εK=0.108 *3*; εL=0.0154 *4*; εM+=0.00444 *12*
(6.18×10^{3} *5*)	2289.88	0.23 *7*	0.030 *9*	6.16 *14*	0.26 *8*	av Eβ=2371 *24*; εK=0.0983 *25*; εL=0.0140 *4*; εM+=0.00402 *11*
(6.19×10^{3} *5*)	2284.14	1.16 *18*	0.152 *24*	5.46 *7*	1.31 *20*	av Eβ=2373 *24*; εK=0.0980 *25*; εL=0.0140 *4*; εM+=0.00401 *11*
(6.54×10^{3} *5*)	1933.15	0.23 *6*	0.025 *7*	6.28 *12*	0.26 *7*	av Eβ=2540 *24*; εK=0.0827 *20*; εL=0.0118 *3*; εM+=0.00338 *9*
(6.84×10^{3} *5*)	1628.65	0.53 *10*	0.049 *9*	6.03 *9*	0.58 *11*	av Eβ=2686 *24*; εK=0.0718 *17*; εL=0.01022 *24*; εM+=0.00294 *7*
(6.87×10^{3} *5*)	1599.10	3.2 *6*	0.29 *6*	5.26 *9*	3.5 *7*	av Eβ=2700 *24*; εK=0.0708 *17*; εL=0.01008 *24*; εM+=0.00290 *7*
(7.05×10^{3} *5*)	1420.31	0.32 *6*	0.027 *5*	6.32 *9*	0.35 *7*	av Eβ=2785 *24*; εK=0.0654 *15*; εL=0.00930 *21*; εM+=0.00267 *6*
(7.48×10^{3} *5*)	990.64	1.5 *4*	0.10 *3*	5.79 *11*	1.6 *4*	av Eβ=2991 *24*; εK=0.0544 *12*; εL=0.00773 *17*;

Continued on next page (footnotes at end of table)

^{140}Eu ε decay 1991Fi03 (continued)

ϵ,β^+ radiations (continued)

E(decay)	E(level)	$I\beta^+$ †	$I\varepsilon$†	Log *ft*	$I(\varepsilon+\beta^+)$†	Comments
						εM+=0.00222 *5*
(7.94×10^3 *5*)	530.95	19 *4*	1.1 *2*	4.83 *9*	20 *4*	av Eβ=3212 *24*; εK=0.0451 *9*; εL=0.00641 *13*; εM+=0.00184 *4*
(8.47×10^3 *5*)	0.0	67 *4*	3.1 *2*	4.43 *3*	70 *4*	av Eβ=3469 *25*; εK=0.0368 *7*; εL=0.00523 *10*; εM+=0.00150 *3*

† Absolute intensity per 100 decays.

$\gamma(^{140}Sm)$

Iγ normalization: From I(K x ray)/I(531γ)=0.142 *14* one obtains I(531γ)=29% *3*.

E_γ†	I_γ†#	E_i(level)	J^π_i	E_f	J^π_f	Mult.‡	Comments
352.4@ *2*	0.4 *2*	1599.10	0+	1246.52	4+		%Iγ=0.12 *6*, using the calculated normalization.
459.9 *1*	11.0 *8*	990.64	2+	530.95	2+		%Iγ=3.2 *4*, using the calculated normalization.
531.0 *1*	100 *9*	530.95	2+	0.0	0+	E2	Mult.: Q from 2015Sa40 (γγ(θ)). %Iγ=29.0 *25*, using the calculated normalization.
608.6 *1*	1.9 *2*	1599.10	0+	990.64	2+		%Iγ=0.55 *8*, using the calculated normalization.
685.1 *2*	0.9 *3*	2284.14	2+	1599.10	0+		%Iγ=0.26 *9*, using the calculated normalization.
715.4 *2*	0.6 *1*	1246.52	4+	530.95	2+	E2	%Iγ=0.17 *4*, using the calculated normalization.
882.7 *3*	0.2 *1*	2482.34	(1,2)+	1599.10	0+		%Iγ=0.06 *3*, using the calculated normalization.
1068.0 *1*	11.0 *11*	1599.10	0+	530.95	2+	E2	%Iγ=3.2 *4*, using the calculated normalization. A_2=+0.27 *11*, A_4=+1.03 *17* for 1068γ-531γ cascade (2015Sa40,2015Kl01). Mult.: ΔJ=2, E2 γ based on angular correlation coefficients.
1097.7 *2*	2.0 *3*	1628.65	0,1,2	530.95	2+		%Iγ=0.58 *10*, using the calculated normalization.
1293.6 *1*	1.2 *2*	2284.14	2+	990.64	2+		%Iγ=0.35 *7*, using the calculated normalization.
1299.4 *2*	0.3 *1*	2289.88	(1,2)	990.64	2+		%Iγ=0.09 *3*, using the calculated normalization.
1402.2 *2*	0.9 *2*	1933.15	0,1,2	530.95	2+		%Iγ=0.26 *7*, using the calculated normalization.
1420.3 *2*	1.2 *2*	1420.31	(1,2)	0.0	0+		%Iγ=0.35 *7*, using the calculated normalization.
1491.3 *2*	2.1 *3*	2482.34	(1,2)+	990.64	2+		%Iγ=0.61 *10*, using the calculated normalization.
1752.8 *2*	1.9 *3*	2284.14	2+	530.95	2+		%Iγ=0.55 *10*, using the calculated normalization.
1758.7 *4*	0.4 *2*	2289.88	(1,2)	530.95	2+		%Iγ=0.12 *6*, using the calculated normalization.
1952.0 *2*	1.4 *2*	2482.34	(1,2)+	530.95	2+		%Iγ=0.41 *7*, using the calculated normalization. E_γ: differs by 3σ from ΔE_{levels}.
2064.9 *3*	3.2 *6*	2595.9	0,1,2	530.95	2+		%Iγ=0.93 *19*, using the calculated normalization.
2283.9 *3*	0.5 *2*	2284.14	2+	0.0	0+		%Iγ=0.15 *6*, using the calculated normalization.
2289.1 *5*	0.2 *1*	2289.88	(1,2)	0.0	0+		%Iγ=0.06 *3*, using the calculated normalization.

† From 1991Fi03.
‡ From Adopted Gammas.
# For absolute intensity per 100 decays, multiply by 0.29 *5*.
@ Placement of transition in the level scheme is uncertain.

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