^{140}Sm ε decay 1981PoZV,1987De04

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

Parent: ^{140}Sm: E=0.0; $J^\pi=0^+$; $T_{1/2}$=14.82 min *12*; Q(ε)=2758 *27*; %ε+%$β^+$ decay=100.0
^{140}Sm-E,J^π,$T_{1/2}$: From ^{140}Sm Adopted Levels.
^{140}Sm-Q(ε): From 2017Wa10.
Measured: γ, γγ, ce (1987De04,1981PoZV,1973VaYZ), $β^+$, βγ (1987De04).
Others: 1968Bl14, 1970Ar17, 1972De23.

^{140}Pm Levels

E(level)	J^π†	$T_{1/2}$	Comments
0.0	1^+	9.2 s *2*	%ε+%$β^+$=100 %ε+%$β^+$: from Adopted Levels. $T_{1/2}$: from Adopted Levels.
139.94 *7*	$(2)^-$		
225.47 *6*	$0^+,1^+,2^+$		
260.61 *7*	$(1,2,3)^+$		
335.35 *9*	$^+$		
339.88 *7*	$(1,2)^+$		
344.93 *7*	$^+$		
415.16 *11*	1^+		
481.22 *8*	$^+$		
503.38 *11*	$0^+,1^+,2^+$		
534.04 *15*	$(^+)$		
565.47 *7*	$(1^+,2^+)$		
572.11 *11*	$(1^+,2^+)$		
576.27 *14*	$(0^-,1^-,2^-)$		
652.36 *10*			
670.16 *16*	$(^+)$		
761.35 *13*	$(^+)$		
808.22 *18*			
844.62 *11*	$0^+,1^+,2^+$		
855.81 *11*			
874.29 *15*			
926.33 *15*			
951.29 *16*			
1065.80 *16*	$(^+)$		
1088.99 *20*			
1173.91 *16*			
1278.8 *5*			
1594.6 *3*			
1618.2 *4*			
1619.25 *11*	1^+		
1623.09 *15*	1^+		
1670.11 *10*	1^+		
2017.4 *5*			

† Adopted values.

^{140}Sm ε decay 1981PoZV,1987De04 (continued)

ε,β+ radiations

E(decay)	E(level)	Iβ+ ‡	Iε‡	Log *ft*	I(ε+β+)†‡	Comments
(1.09×10³ *3*)	1670.11		≈5.5	≈5.1	≈5.5	εK=0.8382 *4*; εL=0.1256 *3*; εM+=0.03625 *10*
(1.13×10³ *3*)	1623.09		≈1.7	≈5.6	≈1.7	εK=0.8386 *4*; εL=0.1252 *3*; εM+=0.03614 *10*
(1.14×10³ *3*)	1619.25		≈5.8	≈5.1	≈5.8	εK=0.8386 *4*; εL=0.1252 *3*; εM+=0.03614 *10*
(1.14×10³ *3*)	1618.2		≈1.1	≈5.8	≈1.1	εK=0.8387 *4*; εL=0.1252 *3*; εM+=0.03613 *10* I(ε+β+): from level feeding balance.
(1.16×10³ *3*)	1594.6		≈1	≈5.9	≈1	εK=0.8388 *4*; εL=0.1251 *3*; εM+=0.03608 *9*
(1.91×10³ *3*)	844.62	≈0.06	≈2	≈6.1	≈2	av Eβ=404 *18*; εK=0.816 *5*; εL=0.1185 *7*; εM+=0.03405 *21*
(2.34×10³ *3*)	415.16	≈0.20	≈1.6	≈6.3	≈1.8	av Eβ=594 *18*; εK=0.749 *9*; εL=0.1080 *13*; εM+=0.0310 *4*
(2.41×10³ *3*)	344.93	≈0.14	≈0.96	≈6.6	≈1.1	av Eβ=625 *18*; εK=0.734 *10*; εL=0.1057 *14*; εM+=0.0303 *4*
(2.53×10³ *3*)	225.47	≈0.5	≈3	≈6.2	≈3	av Eβ=678 *18*; εK=0.706 *10*; εL=0.1014 *15*; εM+=0.0291 *5* E(decay): E(β+)=2200 *300* from β+γ (1987De04). I(ε+β+): estimated upper limit (90% C.L.) from level feeding balance.
(2.76×10³ *3*)	0.0	18 *2*	57 *4*	4.90 *4*	75 *5*	av Eβ=779 *18*; εK=0.646 *12*; εL=0.0926 *17*; εM+=0.0266 *5*

† I(ε+β+)(excited states)=25% *5* from balance of Iγ and I(225γ)/I(716.6γ, ^{140}Pm ε decay) (1981PoZV) assuming I(716.6γ)=0.94% *18* (1975Ke09); I(ε+β+)(excited states)=23% *5* (1987De04).
‡ Absolute intensity per 100 decays.

γ(^{140}Pm)

Iγ normalization: ΣI(γ+ce)(g.s.)=25 % *5* (1981PoZV).
%Iγ in comments are calculated using the calculated normalization.

Eγ†@	Iγ†@a	Ei(level)	J_i^π	Ef	J_f^π	Mult.‡	α&	Comments
35.2 *2*	0.45 *15*	260.61	(1,2,3)+	225.47	0+,1+,2+	(M1+E2)	80 *75*	%Iγ=0.044 *16* α(L)=62 *59*; α(M)=14 *14* α(N)=3.1 *29*; α(O)=0.38 *36*; α(P)=0.00110 *68* Iγ: from 1987De04. α: from intensity feeding the 260 level one deduces α>66. α=154.5 (E2), 4.957 (M1).
75.3 *2*	3.9	415.16	1+	339.88	(1,2)+	M1	3.50 *6*	%Iγ=0.38 *9* α(K)=2.97 *5*; α(L)=0.419 *7*; α(M)=0.0895 *15* α(N)=0.0202 *4*; α(O)=0.00304 *5*; α(P)=0.000191 *3* Mult.: α(L)exp=0.28 *13*.
84.4 *1*	13.0	344.93	+	260.61	(1,2,3)+	M1	2.52	%Iγ=1.3 *3* α(K)=2.14 *3*; α(L)=0.301 *5*; α(M)=0.0643 *10* α(N)=0.01449 *21*; α(O)=0.00218 *4*; α(P)=0.0001376 *20* Mult.: α(L)exp=0.32 *8* (1981PoZV), α(L)exp=0.62 *25* (1973VaYZ).
109.9 *2*	4.9	335.35	+	225.47	0+,1+,2+	M1	1.182	%Iγ=0.48 *11* α(K)=1.003 *15*; α(L)=0.1408 *21*; α(M)=0.0301 *5* α(N)=0.00678 *11*; α(O)=0.001022 *16*; α(P)=6.45×10−5 *10* Mult.: α(K)exp=1.1 *3*, α(L)exp=0.12 *3*

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^{140}Sm ε decay 1981PoZV,1987De04 (continued)

γ(^{140}Pm) (continued)

E_γ †@	I_γ †@a	E_i(level)	J_i^π	E_f	J_f^π	Mult.‡	α&	Comments
								(1981PoZV), α(K)exp=0.87 *26*, K/L=6.8 *24* (1973VaYZ).
114.6 *2*	9.6	339.88	(1,2)$^+$	225.47	0$^+$,1$^+$,2$^+$	M1	1.049	%Iγ=0.94 *21* α(K)=0.891 *14*; α(L)=0.1249 *19*; α(M)=0.0267 *4* α(N)=0.00601 *9*; α(O)=0.000907 *14*; α(P)=5.73×10^{-5} *9* Mult.: α(K)exp=0.88 *22*, α(L)exp=0.13 *3* (1981PoZV), α(K)exp=0.81 *24*, K/L=7.2 *20* (1973VaYZ).
119.5 *2*	2.7	344.93	$^+$	225.47	0$^+$,1$^+$,2$^+$	M1,E2	1.06 *14*	%Iγ=0.26 *6* α(K)=0.75 *4*; α(L)=0.24 *14*; α(M)=0.054 *31* α(N)=0.0120 *67*; α(O)=0.00160 *80*; α(P)=4.1×10^{-5} *10* Mult.: α(K)exp=0.76 *27*.
120.8 *1*	17.0	260.61	(1,2,3)$^+$	139.94	(2)$^-$	E1	0.1597	%Iγ=1.7 *4* α(K)=0.1353 *20*; α(L)=0.0192 *3*; α(M)=0.00409 *6* α(N)=0.000908 *13*; α(O)=0.0001307 *19*; α(P)=6.82×10^{-6} *10* Mult.: α(K)exp=0.14 *3*, α(L)exp=0.020 *5* (1981PoZV), α(K)exp=0.22 *7* (1973VaYZ).
136.4 *2*	3.6	481.22	$^+$	344.93	$^+$	M1	0.641	%Iγ=0.35 *8* α(K)=0.544 *8*; α(L)=0.0762 *12*; α(M)=0.01626 *24* α(N)=0.00366 *6*; α(O)=0.000553 *8*; α(P)=3.50×10^{-5} *6* Mult.: α(K)exp=0.54 *20* α(L)exp=0.075 *29* (1981PoZV), α(K)exp=0.45 *15* (1987De04), α(K)exp=0.55 *16*, K/L=8.6 *30* (1973VaYZ).
140.0 *1*	50	139.94	(2)$^-$	0.0	1$^+$	E1	0.1068	%Iγ=4.9 *14* α(K)=0.0907 *13*; α(L)=0.01273 *18*; α(M)=0.00270 *4* α(N)=0.000601 *9*; α(O)=8.71×10^{-5} *13*; α(P)=4.66×10^{-6} *7* Mult.: α(K)exp=0.090 *19*, α(L)exp=0.013 *2* (1981PoZV), α(K)exp=0.08 *2* (1987De04), α(K)exp=0.098 *29*, K/L=7.6 *15* (1973VaYZ).
141.3 *2*	3.0	481.22	$^+$	339.88	(1,2)$^+$	[M1,E2]	0.62 *5*	%Iγ=0.29 *7* α(K)=0.46 *3*; α(L)=0.125 *56*; α(M)=0.028 *14* α(N)=0.0061 *29*; α(O)=8.4×10^{-4} *34*; α(P)=2.6×10^{-5} *6* I_γ: 0.7 *2* in 1987De04.
145.7 *2*	2.6	481.22	$^+$	335.35	$^+$	M1	0.533	%Iγ=0.25 *6* α(K)=0.453 *7*; α(L)=0.0632 *10*; α(M)=0.01350 *20* α(N)=0.00304 *5*; α(O)=0.000459 *7*; α(P)=2.91×10^{-5} *5* Mult.: α(K)exp=0.52 *19*, α(L)exp=0.056 *21* (1981PoZV), α(K)exp=0.32 *8* (1973VaYZ).
150.4 *2*	1.0	565.47	(1$^+$,2$^+$)	415.16	1$^+$	(M1)	0.487	I_γ: 0.9 *3* in 1987De04. %Iγ=0.098 *22* α(K)=0.414 *6*; α(L)=0.0578 *9*; α(M)=0.01234 *18*

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^{140}Sm ε decay 1981PoZV,1987De04 (continued)

γ(^{140}Pm) (continued)

E_γ †@	I_γ †@a	E_i(level)	J_i^π	E_f	J_f^π	Mult.‡	α&	Comments
								α(N)=0.00278 *4*; α(O)=0.000420 *6*; α(P)=2.66×10^{-5} *4* Mult.: α(K)exp=0.34 *15* (1981PoZV), α(K)exp=0.32 *8* (1973VaYZ).
158.5 *2*	6.3	503.38	0$^+$,1$^+$,2$^+$	344.93	$^+$	(M1)	0.421	%Iγ=0.62 *14* α(K)=0.358 *6*; α(L)=0.0499 *8*; α(M)=0.01065 *16* α(N)=0.00240 *4*; α(O)=0.000362 *6*; α(P)=2.30×10^{-5} *4* Mult.: α(K)exp=0.32 *11* (1981PoZV), α(K)exp=0.28 *10* (1987De04), α(K)exp=0.36 *9*, K/L=6.4 *16* (1973VaYZ).
163.6 *2*	0.9	503.38	0$^+$,1$^+$,2$^+$	339.88	(1,2)$^+$	(M1)	0.386	%Iγ=0.088 *20* α(K)=0.328 *5*; α(L)=0.0457 *7*; α(M)=0.00975 *14* α(N)=0.00220 *4*; α(O)=0.000332 *5*; α(P)=2.10×10^{-5} *3* Mult.: α(K)exp=0.34 *14*.
189.6 *2*	0.4	415.16	1$^+$	225.47	0$^+$,1$^+$,2$^+$			%Iγ=0.039 *9*
195.4 *2*	1.0	335.35	$^+$	139.94	(2)$^-$			%Iγ=0.098 *22*
199.9 *2*	7.0	339.88	(1,2)$^+$	139.94	(2)$^-$	E1	0.0408	%Iγ=0.68 *16* α(K)=0.0347 *5*; α(L)=0.00477 *7*; α(M)=0.001012 *15* α(N)=0.000226 *4*; α(O)=3.31×10^{-5} *5*; α(P)=1.86×10^{-6} *3* Mult.: α(K)exp=0.028 *10* (1981PoZV), α(K)exp=0.054 *14* (1973VaYZ).
204.9 *2*	1.0	344.93	$^+$	139.94	(2)$^-$			%Iγ=0.098 *22*
220.6 *1*	5.0	565.47	(1$^+$,2$^+$)	344.93	$^+$	(M1)	0.1695	%Iγ=0.49 *11* α(K)=0.1442 *21*; α(L)=0.0200 *3*; α(M)=0.00426 *6* α(N)=0.000960 *14*; α(O)=0.0001450 *21*; α(P)=9.22×10^{-6} *13* Mult.: α(K)exp=0.15 *4*, α(L)exp=0.030 *8* (1981PoZV), α(K)exp=0.16 *4* (1987De04).
220.7 *1*	8.0	481.22	$^+$	260.61	(1,2,3)$^+$	(M1)	0.1693	%Iγ=0.78 *18* α(K)=0.1440 *21*; α(L)=0.0199 *3*; α(M)=0.00425 *6* α(N)=0.000959 *14*; α(O)=0.0001448 *21*; α(P)=9.21×10^{-6} *13* Mult.: α(K)exp=0.15 *4*, α(L)exp=0.030 *8* (1981PoZV), α(K)exp=0.16 *4* (1987De04), α(K)exp=0.15 *3*, K/L=5.7 *10* (1973VaYZ).
225.4 *1*	100	225.47	0$^+$,1$^+$,2$^+$	0.0	1$^+$	M1	0.1599	%Iγ=9.8 *23* α(K)=0.1360 *20*; α(L)=0.0188 *3*; α(M)=0.00401 *6* α(N)=0.000905 *13*; α(O)=0.0001367 *20*; α(P)=8.70×10^{-6} *13* Mult.: α(K)exp=0.12 *2*, α(L)exp=0.018 *3* (1981PoZV), α(K)exp=0.13 *2* (1987De04), α(K)exp=0.14 *3*, K/L=8.8 *13* (1973VaYZ). I_γ: Iγ=15% *3* (1973VaYZ).
237.0 *2*	1.0	572.11	(1$^+$,2$^+$)	335.35	$^+$	(M1)	0.1396	%Iγ=0.098 *22* α(K)=0.1188 *17*; α(L)=0.01641 *24*; α(M)=0.00350 *5* α(N)=0.000789 *12*; α(O)=0.0001192 *17*; α(P)=7.59×10^{-6} *11*

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^{140}Sm ε decay 1981PoZV,1987De04 (continued)

γ(^{140}Pm) (continued)

E_γ †@	I_γ †@a	E_i(level)	J_i^π	E_f	J_f^π	Mult.‡	α&	Comments
								Mult.: α(K)exp=0.11 *5* (1981PoZV), α(K)exp=0.12 *4* (1973VaYZ).
255.6 *2*	1.8	481.22	$^+$	225.47	$0^+,1^+,2^+$	(M1)	0.1139	%Iγ=0.18 *4* α(K)=0.0970 *14*; α(L)=0.01337 *19*; α(M)=0.00285 *4* α(N)=0.000643 *9*; α(O)=9.71×10^{-5} *14*; α(P)=6.19×10^{-6} *9*
								α(K)exp=0.13 *5* (1981PoZV), α(K)exp=0.095 *19* (1973VaYZ).
260.6 *2*	1.6	260.61	$(1,2,3)^+$	0.0	1^+			%Iγ=0.16 *5* Mult.: α(K)exp=0.10 *4*.
x267.5# *2*	2.7 *4*							%Iγ=0.26 *7*
279.0 *2*	4.9	844.62	$0^+,1^+,2^+$	565.47	$(1^+,2^+)$	(M1)	0.0902	%Iγ=0.48 *11* α(K)=0.0768 *11*; α(L)=0.01055 *15*; α(M)=0.00225 *4* α(N)=0.000507 *8*; α(O)=7.67×10^{-5} *11*; α(P)=4.89×10^{-6} *7* Mult.: α(K)exp=0.075 *21*, α(L)exp=0.011 *4* (1981PoZV), α(K)exp=0.069 *10*, K/L=8.7 35 (1973VaYZ).
x306.0 *2*	1.3					(E2)	0.0510	%Iγ=0.13 *3* α(K)=0.0402 *6*; α(L)=0.00850 *12*; α(M)=0.00188 *3* α(N)=0.000415 *6*; α(O)=5.79×10^{-5} *9*; α(P)=2.19×10^{-6} *3* Mult.: α(K)exp=0.043 *9* (1973VaYZ).
308.7 *2*	0.9	534.04	$(^+)$	225.47	$0^+,1^+,2^+$	(M1)	0.0689	%Iγ=0.088 *20* α(K)=0.0587 *9*; α(L)=0.00805 *12*; α(M)=0.001715 *25* α(N)=0.000387 *6*; α(O)=5.85×10^{-5} *9*; α(P)=3.74×10^{-6} *6* Mult.: α(K)exp=0.054 *26* (1981PoZV).
311.4 *2*	2.5	572.11	$(1^+,2^+)$	260.61	$(1,2,3)^+$	(M1)	0.0674	%Iγ=0.24 *6* α(K)=0.0574 *8*; α(L)=0.00786 *11*; α(M)=0.001676 *24* α(N)=0.000378 *6*; α(O)=5.71×10^{-5} *8*; α(P)=3.65×10^{-6} *6* Mult.: α(K)exp=0.047 *18* (1981PoZV), α(K)exp=0.055 *8* (1973VaYZ).
312.4 *2*	1.7	652.36		339.88	$(1,2)^+$			%Iγ=0.17 *4*
335.5 *2*	0.5	335.35	$^+$	0.0	1^+			%Iγ=0.049 *15*
339.8b *1*	18.0b	339.88	$(1,2)^+$	0.0	1^+	E2	0.0370	%Iγ=1.8 *6* α(K)=0.0295 *5*; α(L)=0.00588 *9*; α(M)=0.001294 *19* α(N)=0.000287 *4*; α(O)=4.03×10^{-5} *6*; α(P)=1.636×10^{-6} *23* Mult.: α(K)exp=0.030 *8*, α(L)exp=0.0059 *17* (1981PoZV), α(K)exp=0.027 *5* (1987De04), α(K)exp=0.028 *4* (1973VaYZ).
339.8b *1*	1.0b	565.47	$(1^+,2^+)$	225.47	$0^+,1^+,2^+$	(E2)	0.0370	%Iγ=0.098 *22* α(K)=0.0295 *5*; α(L)=0.00588 *9*; α(M)=0.001294 *19* α(N)=0.000287 *4*; α(O)=4.03×10^{-5} *6*;

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^{140}Sm ε decay 1981PoZV,1987De04 (continued)

γ(^{140}Pm) (continued)

E_γ[†][@]	I_γ[†][@][a]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	α[&]	Comments
								α(P)=1.636×10^{-6} *23* Mult.: α(K)exp=0.030 *8*, α(L)exp=0.0059 *17* (1981PoZV).
341.3 *2*	21	844.62	$0^+,1^+,2^+$	503.38	$0^+,1^+,2^+$			%Iγ=2.1 *5*
344.9 *2*	9.6	344.93	$^+$	0.0	1^+	(E2)	0.0354	%Iγ=0.9 *3* α(K)=0.0283 *4*; α(L)=0.00559 *8*; α(M)=0.001229 *18* α(N)=0.000273 *4*; α(O)=3.83×10^{-5} *6*; α(P)=1.570×10^{-6} *23* Mult.: α(K)exp=0.031 *8* (1981PoZV), α(K)exp=0.038 *15* (1987De04), α(K)exp=0.030 *5* (1973VaYZ).
[x]370.3 *2*	2.1							%Iγ=0.21 *5*
409.5 *2*	1.6	670.16	$(^+)$	260.61	$(1,2,3)^+$	(M1)	0.0330	%Iγ=0.16 *4* α(K)=0.0282 *4*; α(L)=0.00383 *6*; α(M)=0.000814 *12* α(N)=0.000184 *3*; α(O)=2.78×10^{-5} *4*; α(P)=1.78×10^{-6} *3* Mult.: α(K)exp=0.025 *8* (1973VaYZ).
415.3 *2*	1.5	415.16	1^+	0.0	1^+			%Iγ=0.15 *5*
421.6 *2*		761.35	$(^+)$	339.88	$(1,2)^+$			
425.6 *2*	1.1	565.47	$(1^+,2^+)$	139.94	$(2)^-$			%Iγ=0.107 *25*
427.0 *2*	1.0	652.36		225.47	$0^+,1^+,2^+$			%Iγ=0.098 *22*
431.9 *2*	0.6	572.11	$(1^+,2^+)$	139.94	$(2)^-$			%Iγ=0.059 *14*
436.3 *2*	0.6	576.27	$(0^-,1^-,2^-)$	139.94	$(2)^-$			%Iγ=0.059 *14*
445.2 *2*	1.4	1619.25	1^+	1173.91				%Iγ=0.14 *3*
468.5 *3*	1.2 *3*	808.22		339.88	$(1,2)^+$			%Iγ=0.12 *4* E_γ: observed only in 1987De04 and 1973VaYZ. α(K)exp=0.012 *6* (1973VaYZ).
481.1 *2*	1.0	481.22	$^+$	0.0	1^+			%Iγ=0.10 *3* α(K)exp=0.012 *5* (1973VaYZ).
503.3 *2*	5.7	503.38	$0^+,1^+,2^+$	0.0	1^+	M1	0.0195	%Iγ=0.56 *17* α(K)=0.01668 *24*; α(L)=0.00225 *4*; α(M)=0.000478 *7* α(N)=0.0001078 *16*; α(O)=1.633×10^{-5} *23*; α(P)=1.053×10^{-6} *15* Mult.: α(K)exp=0.015 *6* (1981PoZV), α(K)exp=0.013 *5* (1973VaYZ).
520.5 *2*	1.5	855.81		335.35	$^+$			%Iγ=0.15 *4*
533.9 *2*	1.5	534.04	$(^+)$	0.0	1^+	(E2)	0.01033	%Iγ=0.15 *5* α(K)=0.00855 *12*; α(L)=0.001397 *20*; α(M)=0.000302 *5* α(N)=6.75×10^{-5} *10*; α(O)=9.80×10^{-6} *14*; α(P)=4.99×10^{-7} *7* Mult.: α(K)exp=0.0085 *25* (1973VaYZ).
565.6 *2*	3.3	565.47	$(1^+,2^+)$	0.0	1^+	(M1)	0.01457	%Iγ=0.32 *10* α(K)=0.01245 *18*; α(L)=0.001672 *24*; α(M)=0.000356 *5* α(N)=8.02×10^{-5} *12*; α(O)=1.215×10^{-5} *17*; α(P)=7.84×10^{-7} *11* Mult.: α(K)exp=0.011 *5* (1981PoZV), α(K)exp=0.0090 *18* (1973VaYZ).
572.2 *2*	3.0	572.11	$(1^+,2^+)$	0.0	1^+	(M1)	0.01416	%Iγ=0.29 *9*

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^{140}Sm ε decay 1981PoZV,1987De04 (continued)

γ(^{140}Pm) (continued)

E_γ †@	I_γ †@a	E_i(level)	J_i^π	E_f	J_f^π	Mult.‡	α&	Comments
								α(K)=0.01210 *17*; α(L)=0.001624 *23*; α(M)=0.000345 *5* α(N)=7.79×10^{-5} *11*; α(O)=1.180×10^{-5} *17*; α(P)=7.62×10^{-7} *11* Mult.: α(K)exp=0.010 *5* (1981PoZV).
576.3 *2*	4.0	576.27	(0$^-$,1$^-$,2$^-$)	0.0	1$^+$	(E1)	0.00300	%Iγ=0.39 *12* α(K)=0.00258 *4*; α(L)=0.000336 *5*; α(M)=7.12×10^{-5} *10* α(N)=1.599×10^{-5} *23*; α(O)=2.40×10^{-6} *4*; α(P)=1.488×10^{-7} *21* Mult.: α(K)exp<0.0074 (1981PoZV).
586.3 *2*	1.7	926.33		339.88	(1,2)$^+$			%Iγ=0.17 *4*
604.2 *2*	2.2	1670.11	1$^+$	1065.80	(+)			%Iγ=0.21 *5*
608.3 *2*	1.4	1173.91		565.47	(1$^+$,2$^+$)			%Iγ=0.14 *3*
630.5 *2*	0.6	855.81		225.47	0$^+$,1$^+$,2$^+$			%Iγ=0.059 *14*
648.9 *2*	2.5	874.29		225.47	0$^+$,1$^+$,2$^+$			%Iγ=0.24 *6*
652.5 *2*	1.7	652.36		0.0	1$^+$			%Iγ=0.17 *5*
668.2 *2*	3.3	808.22		139.94	(2)$^-$			%Iγ=0.32 *8* α(K)exp=0.0037 *11* (1973VaYZ).
671.6 *2*	0.4	1623.09	1$^+$	951.29				%Iγ=0.039 *9*
701.0 *2*	2.8	926.33		225.47	0$^+$,1$^+$,2$^+$			%Iγ=0.27 *7* α(K)exp=0.0037 *11* (1973VaYZ).
725.8 *2*	2.3	1065.80	(+)	339.88	(1,2)$^+$	(M1)	0.00788	%Iγ=0.22 *5* α(K)=0.00674 *10*; α(L)=0.000898 *13*; α(M)=0.000191 *3* α(N)=4.30×10^{-5} *6*; α(O)=6.52×10^{-6} *10*; α(P)=4.23×10^{-7} *6* Mult.: α(K)exp=0.0069 *17* (1973VaYZ).
761.5 *2*	5.6	761.35	(+)	0.0	1$^+$	(E2)	0.00431	%Iγ=0.55 *17* α(K)=0.00363 *5*; α(L)=0.000535 *8*; α(M)=0.0001147 *16* α(N)=2.57×10^{-5} *4*; α(O)=3.80×10^{-6} *6*; α(P)=2.16×10^{-7} *3* Mult.: α(K)exp=0.0040 *8* (1973VaYZ).
774.7 *2*	4.1	1619.25	1$^+$	844.62	0$^+$,1$^+$,2$^+$			%Iγ=0.40 *9*
808.3[c]	0.6	808.22		0.0	1$^+$			%Iγ=0.059 *18*
x811.0[#] *3*	2.6 *4*							%Iγ=0.25 *7*
814.5 *2*	3.1	1670.11	1$^+$	855.81				%Iγ=0.30 *7*
825.5 *2*	7.5	1670.11	1$^+$	844.62	0$^+$,1$^+$,2$^+$	M1	0.00577	%Iγ=0.73 *17* α(K)=0.00494 *7*; α(L)=0.000655 *10*; α(M)=0.0001390 *20* α(N)=3.14×10^{-5} *5*; α(O)=4.76×10^{-6} *7*; α(P)=3.09×10^{-7} *5* Mult.: α(K)exp=0.0051 *18* (1981PoZV), α(K)exp=0.0039 *8* (1973VaYZ).
844.8 *2*	6.2	844.62	0$^+$,1$^+$,2$^+$	0.0	1$^+$			%Iγ=0.61 *18*
855.8 *2*	1.0	855.81		0.0	1$^+$			%Iγ=0.10 *3*
858.0 *5*	0.4	1619.25	1$^+$	761.35	(+)			%Iγ=0.039 *9* I_γ: 7.0 *9* in 1987De04 (for Eγ=858.5 *2*).
862.0 *2*	2.0	1623.09	1$^+$	761.35	(+)			%Iγ=0.20 *5*
863.5 *2*	1.8	1088.99		225.47	0$^+$,1$^+$,2$^+$			%Iγ=0.18 *4*
874.2 *2*	4.8	874.29		0.0	1$^+$			%Iγ=0.47 *14*
926.3[c] *2*	0.9	926.33		0.0	1$^+$			%Iγ=0.09 *3*
951.1 *2*	2.9	951.29		0.0	1$^+$			%Iγ=0.28 *9*
967.0 *2*	1.8	1619.25	1$^+$	652.36				%Iγ=0.18 *4*
999.9 *2*	1.2	1670.11	1$^+$	670.16	(+)			%Iγ=0.12 *3*

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^{140}Sm ε decay 1981PoZV,1987De04 (continued)

γ(^{140}Pm) (continued)

E_γ †@	I_γ †@a	E_i(level)	J_i^π	E_f	J_f^π	Comments
1017.8 *2*	1.5	1670.11	1^+	652.36		%Iγ=0.15 *4*
1018.2 *5*	1.5	1278.8		260.61	$(1,2,3)^+$	%Iγ=0.15 *4*
1022.6 *5*	2.3	1594.6		572.11	$(1^+,2^+)$	%Iγ=0.22 *5*
1046.9 *5*	1.8	1619.25	1^+	572.11	$(1^+,2^+)$	%Iγ=0.18 *4*
1053.5[c] *5*	0.9	1278.8		225.47	$0^+,1^+,2^+$	%Iγ=0.088 *20*
1065.5[c] *5*	0.3	1065.80	$(^+)$	0.0	1^+	%Iγ=0.029 *9*
1089.1 *5*	3.9	1088.99		0.0	1^+	%Iγ=0.38 *12*
1093.9 *5*	1.2	1670.11	1^+	576.27	$(0^-,1^-,2^-)$	%Iγ=0.12 *3*
1098.0 *5*	5.2	1670.11	1^+	572.11	$(1^+,2^+)$	%Iγ=0.51 *12*
1116.0 *5*	2.3	1619.25	1^+	503.38	$0^+,1^+,2^+$	%Iγ=0.22 *5*
1119.6 *5*	2.4	1623.09	1^+	503.38	$0^+,1^+,2^+$	%Iγ=0.23 *6*
1138.1 *3*	18.0	1619.25	1^+	481.22	$^+$	%Iγ=1.8 *4*
1166.7 *5*	6.9	1670.11	1^+	503.38	$0^+,1^+,2^+$	%Iγ=0.67 *16*
[x]1173.3[#] *3*	2.9 *5*					%Iγ=0.28 *8*
1188.9 *5*	1.4	1670.11	1^+	481.22	$^+$	%Iγ=0.14 *3* I_γ: Iγ=0.7 *2* in 1987De04.
1249.5 *5*	4.2	1594.6		344.93	$^+$	%Iγ=0.41 *10*
1254.7 *5*	2.6	1594.6		339.88	$(1,2)^+$	%Iγ=0.25 *6*
1274.2 *3*	16.0	1619.25	1^+	344.93	$^+$	%Iγ=1.6 *4*
1278.1 *5*	5.6	1618.2		339.88	$(1,2)^+$	%Iγ=0.55 *13*
1278.1 *5*	5.6	1623.09	1^+	344.93	$^+$	%Iγ=0.55 *13*
1283.0 *5*	5.3	1618.2		335.35	$^+$	%Iγ=0.52 *12*
1283.0 *5*	5.3	1623.09	1^+	339.88	$(1,2)^+$	%Iγ=0.52 *12*
1324.9 *5*	4.4	1670.11	1^+	344.93	$^+$	%Iγ=0.43 *10*
1330.0 *5*	3.1	1670.11	1^+	339.88	$(1,2)^+$	%Iγ=0.30 *7*
1393.5 *3*	12.0	1619.25	1^+	225.47	$0^+,1^+,2^+$	%Iγ=1.2 *3*
1397.5 *5*	1.5	1623.09	1^+	225.47	$0^+,1^+,2^+$	%Iγ=0.15 *4*
[x]1427.1 *3*	1.1					%Iγ=0.107 *25*
1444.4 *5*	1.4	1670.11	1^+	225.47	$0^+,1^+,2^+$	%Iγ=0.14 *3*
1479.9 *5*	1.1	1619.25	1^+	139.94	$(2)^-$	%Iγ=0.107 *25*
1530.2 *3*	13.0	1670.11	1^+	139.94	$(2)^-$	%Iγ=1.3 *3*
[x]1578.1 *3*	4.4					%Iγ=0.43 *10*
1594.7[c] *5*	0.5	1594.6		0.0	1^+	%Iγ=0.049 *15*
[x]1596.1 *3*	1.4					%Iγ=0.14 *3*
1619.1[c] *5*	0.6	1619.25	1^+	0.0	1^+	%Iγ=0.059 *18*
1623.0[c] *5*	0.3	1623.09	1^+	0.0	1^+	%Iγ=0.029 *9*
[x]1642.3 *3*	1.6					%Iγ=0.16 *4*
1670.0 *5*	4.4	1670.11	1^+	0.0	1^+	%Iγ=0.43 *13*
[x]1672.2 *3*	0.9					%Iγ=0.088 *20*
1677.5 *5*	1.8	2017.4		339.88	$(1,2)^+$	%Iγ=0.18 *4*
[x]1786.3 *3*	1.4					%Iγ=0.14 *3*
[x]1815.5 *3*	1.1					%Iγ=0.107 *25*
[x]1959.4 *3*	2.1					%Iγ=0.21 *5*
[x]2017.5 *3*	1.3					%Iγ=0.13 *3*

† From 1981PoZV.
‡ α(K)exp were normalized to α(K)(E3)=0.044 for 419.9γ in ^{140}Nd.
# Observed only in 1987De04.
@ Eγ(Iγ): 805.1 *5* (0.47 *7*), 904.3 *5* (0.40 *7*), 1057.8 *7* (2.1 *2*), 1409.6 *7* (0.33 *20*) were observed only in 1973VaYZ.
& Additional information 1.
a For absolute intensity per 100 decays, multiply by 0.098 *22*.

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^{140}Sm ε decay 1981PoZV,1987De04 (continued)

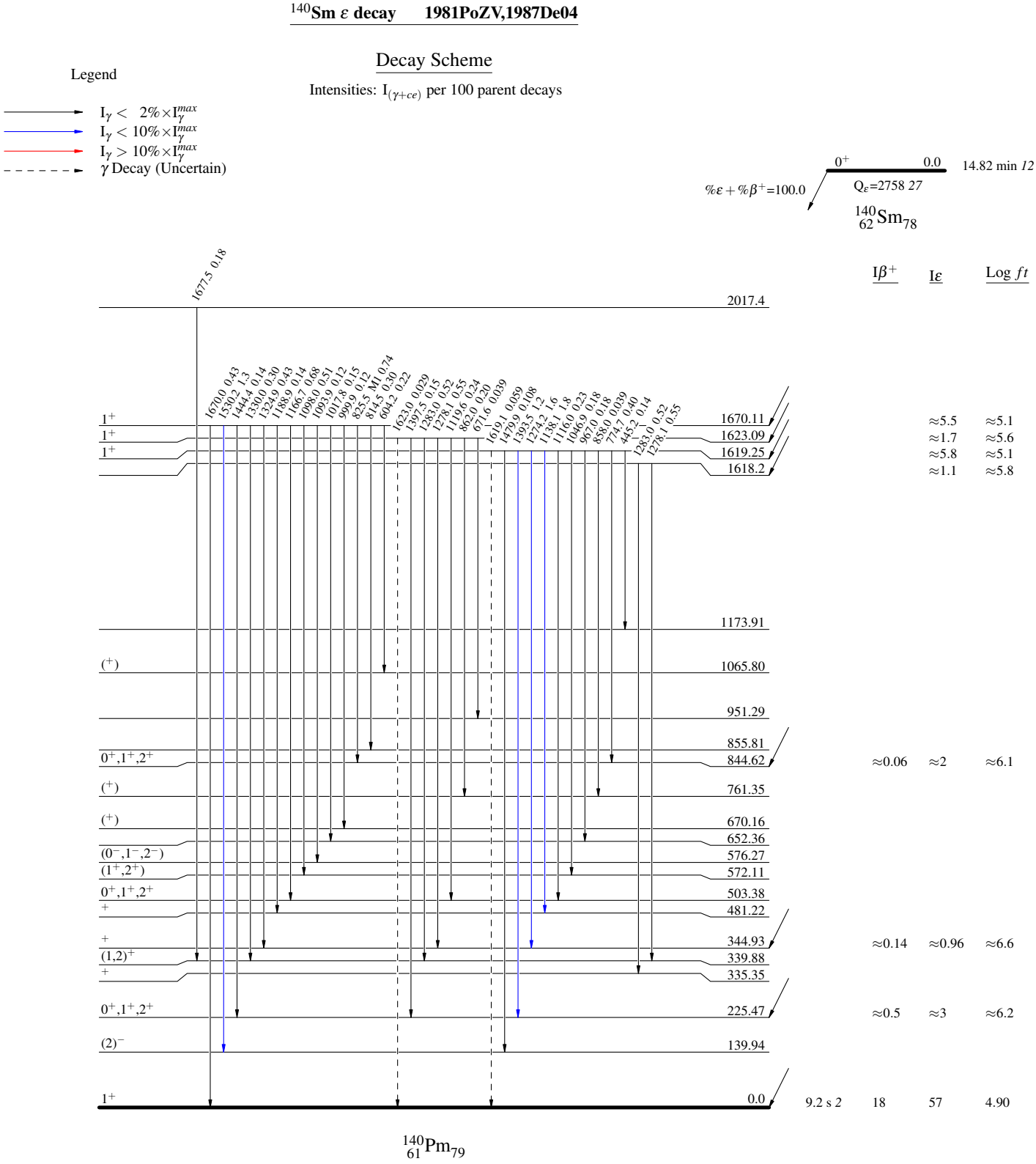
γ(^{140}Pm) (continued)

[b] Multiply placed with intensity suitably divided.
[c] Placement of transition in the level scheme is uncertain.
[x] γ ray not placed in level scheme.

^{140}Sm ε decay 1981PoZV,1987De04

Decay Scheme

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays



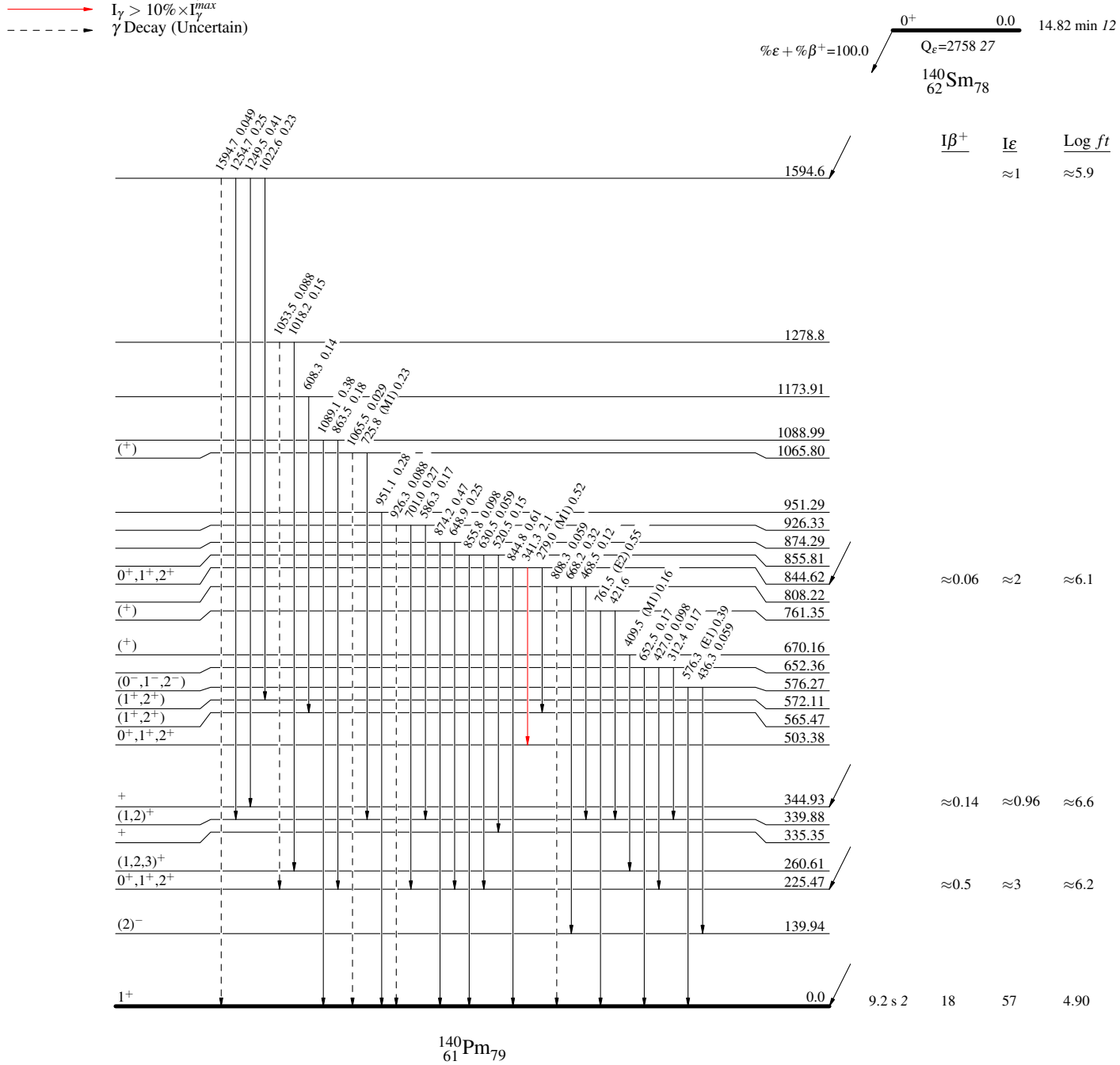
$^{140}_{61}Pm_{79}$

^{140}Sm ε decay 1981PoZV,1987De04

Decay Scheme (continued)

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays

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)



^{140}Sm ε decay 1981PoZV,1987De04

Decay Scheme (continued)

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

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