^{147}Sm(p,2nγ) 1980Er04

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Yu. Khazov, A. Rodionov and G. Shulyak	NDS 136, 163 (2016)	14-Jul-2016

1980Er04: ^{147}Sm(p,2nγ), E=19-22 MeV; measured Eγ, Iγ, E(ce), Ice, $T_{1/2}$ of isomer. ^{146}Eu; deduced levels, J^π, γ mult., configurations. Model calculations.

1980IsZZ: ^{147}Sm(p,2nγ), E not given; measured Eγ, Iγ, $\gamma\gamma$ coin. ^{146}Eu; deduced levels, J^π.

1962Re04: ^{147}Sm(p,2nγ), E=20.8 MeV; measured Eγ, Iγ(t), $T_{1/2}$. ^{146}Eu; deduced isomer.

The level scheme is from 1980Er04 and 1980IsZZ. γ lines of 274.9 and 358.2 are doublets; the energy difference between doublet members is <0.2 keV (1980Er04).

^{146}Eu Levels

E(level)[@&]	J^π[a]	$T_{1/2}$	Comments
0.0[†]	4$^-$		
14.5[†] *3*	5$^-$		
114.73 *25*	3$^-$		
230.2 *4*	2$^-$		
289.4[†] *3*	6$^-$		
316.6[‡] *3*	5$^-$		
331.07 *25*			
372.7[‡] *3*	6$^-$		
384.7 *5*	1$^-$		
497.8 *5*			
647.6[‡] *4*	7$^-$		
666.4[#] *4*	9$^+$	239 μs *9*	$T_{1/2}$: from γ(t); average of 240 μs *10* (1962Re04) and 235 μs *25* (1980Er04).
752.8 *5*			
805.9 *5*			
839.5 *5*			
914.3 *5*			

[†] Possible configuration=$\pi d^{-1}_{5/2}\times\nu f_{7/2}$ (1980Er04).

[‡] Possible configuration=$\pi g^{-1}_{7/2}\times\nu f_{7/2}$ (1980Er04).

[#] Possible configuration=$\pi h_{11/2}\times\nu f_{7/2}$ (1980Er04).

[@] If $\Delta E\gamma$ not given, ±0.30 keV assumed for least-squares fitting.

[&] From a least-squares fit to Eγ.

[a] From 'Adopted Levels'.

γ(^{146}Eu)

E$_\gamma$[†]	E$_i$(level)	J^π_i	E$_f$	J^π_f	Mult.[#]	α[@]	Comments
14.5	14.5	5$^-$	0.0	4$^-$	M1	83.9	α(L)=65.8 *10*; α(M)=14.26 *20* α(N)=3.26 *5*; α(O)=0.515 *8*; α(P)=0.0504 *7* E$_\gamma$: γ ray was observed in ^{142}Nd(^{7}Li,3nγ) reaction (1980IsZZ).
(18.8)	666.4	9$^+$	647.6	7$^-$	[M2]	7.27×10^3	α(L)=5.55×10^3 *8*; α(M)=1359 *19* α(N)=313 *5*; α(O)=46.8 *7*; α(P)=3.37 *5*
56.0	372.7	6$^-$	316.6	5$^-$			
83.3	372.7	6$^-$	289.4	6$^-$			
86.9	839.5		752.8				
114.7	114.73	3$^-$	0.0	4$^-$	M1+E2	1.36 *12*	α(K)=0.93 *13*; α(L)=0.34 *19*; α(M)=0.08 *5*

Continued on next page (footnotes at end of table)

^{147}Sm(p,2nγ) 1980Er04 (continued)

γ(^{146}Eu) (continued)

E_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	α[@]	Comments
							α(N)=0.017 *10*; α(O)=0.0024 *13*; α(P)=9.E−5 *3* Mult.: from ^{146}Gd ε decay.
115.5	230.2	2⁻	114.73	3⁻	M1+E2	1.33 *11*	α(K)=0.91 *13*; α(L)=0.33 *18*; α(M)=0.07 *5* α(N)=0.017 *10*; α(O)=0.0024 *13*; α(P)=9.E−5 *3* Mult.: from ^{146}Gd ε decay.
154.5	384.7	1⁻	230.2	2⁻			
216.3	331.07		114.73	3⁻			
267.6	497.8		230.2	2⁻			
274.9[‡]	289.4	6⁻	14.5	5⁻	M1	0.1110	α(K)exp=0.098 *4*; K/L=6.8 *6* α(K)=0.0942 *14*; α(L)=0.01321 *19*; α(M)=0.00285 *4* α(N)=0.000653 *10*; α(O)=0.0001037 *15*; α(P)=1.033×10^{-5} *15* α: for the doublet: the second transition from 647.6 keV level, its total intensity is approximately three times less according to fig. 2 of 1980Er04.
274.9[‡]	647.6	7⁻	372.7	6⁻	M1	0.1110	α(K)exp=0.098 *4*; K/L=6.8 *6* α(K)=0.0942 *14*; α(L)=0.01321 *19*; α(M)=0.00285 *4* α(N)=0.000653 *10*; α(O)=0.0001037 *15*; α(P)=1.033×10^{-5} *15* α: see comment for 289.4 keV level.
293.7	666.4	9⁺	372.7	6⁻	E3	0.254	α(K)exp=0.13 *2*; K/L=1.8 *4* α(K)=0.1502 *21*; α(L)=0.0798 *12*; α(M)=0.0188 *3* α(N)=0.00420 *6*; α(O)=0.000590 *9*; α(P)=1.482×10^{-5} *21*
316.6	316.6	5⁻	0.0	4⁻			
331.1	331.07		0.0	4⁻			
358.2	372.7	6⁻	14.5	5⁻	M1	0.0551	α(K)exp=0.048 *2*; K/L=7.2 *10* α(K)=0.0468 *7*; α(L)=0.00651 *10*; α(M)=0.001403 *20* α(N)=0.000321 *5*; α(O)=5.11×10^{-5} *8*; α(P)=5.11×10^{-6} *8* E_γ: doublet, the second transition from 647.6 keV level, energy difference between members is <0.2 keV (1980Er04). α: for the doublet.
358.2	647.6	7⁻	289.4	6⁻	M1	0.0551	α(K)exp=0.048 *2*; K/L=7.2 *10* α(K)=0.0468 *7*; α(L)=0.00651 *10*; α(M)=0.001403 *20* α(N)=0.000321 *5*; α(O)=5.11×10^{-5} *8*; α(P)=5.11×10^{-6} *8* E_γ,α: doublet, see comment for 372.7 keV level.
368.1	752.8		384.7	1⁻			
377.0	666.4	9⁺	289.4	6⁻	E3	0.0994	α(K)exp=0.0668; K/L=2.55 *20* α(K)=0.0668 *10*; α(L)=0.0252 *4*; α(M)=0.00584 *9* α(N)=0.001312 *19*; α(O)=0.000188 *3*; α(P)=6.89×10^{-6} *10*
421.2	805.9		384.7	1⁻			
522.6	752.8		230.2	2⁻			
575.7	805.9		230.2	2⁻			
609.2	839.5		230.2	2⁻			
624.9	914.3		289.4	6⁻			

[†] From 1980Er04 and 1980IsZZ. ΔEγ=0.3 keV was assumed by evaluators for all γ's.
[‡] Doublet spacing was determined to be 0.121 keV *7* with bent crystal spectrometer (1986Bo23).
[#] from α(exp) (1980Er04); were normalized to α(K)(377γ, E3)=0.0668 (with BrIcc calculated).
[@] Additional information 1.

Legend

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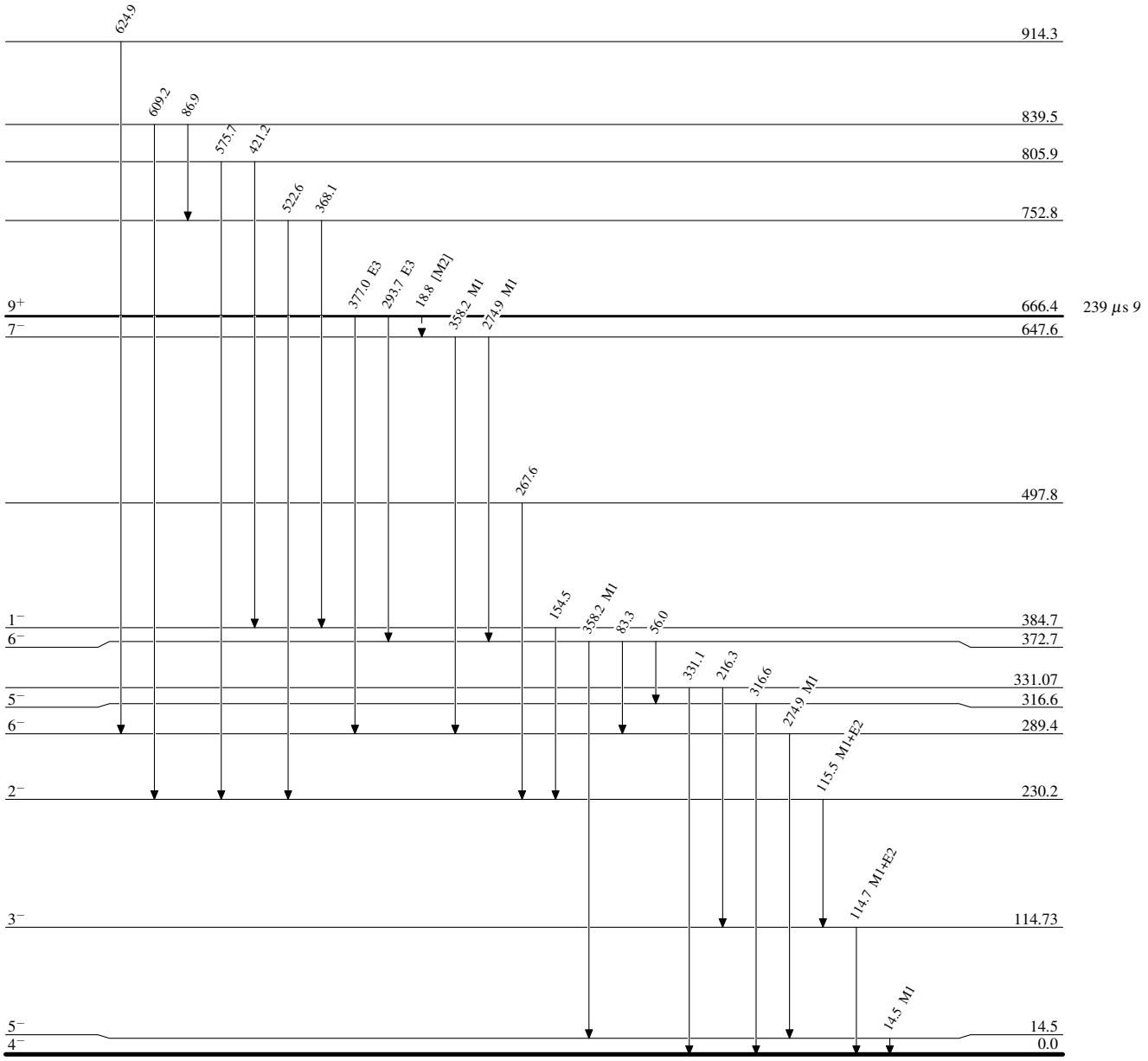
Level Scheme

γ Decay (Uncertain)



$^{146}_{63}Eu_{83}$