^{150}Sm(α,4nγ) E=50 MeV 1977Ha21

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	S. K. Basu, A. A. Sonzogni	NDS 114, 435 (2013)	1-Apr-2013

See 1976Ba18 for details of these authors' work.

^{150}Gd Levels

E(level)	J^π†	$T_{1/2}$	E(level)	J^π†	E(level)	J^π†
0.0	0^+	1.79×10^6 y *8*	2392.41 *23*	7^+	3366.8 *4*	$(11)^-$
638.05 *10*	2^+		2554.44 *20*	8^+	4131.5 *5*	$(13)^-$
1134.35 *14*	3^-		2767.7 *5*	(8^+)	4187.3 *5*	$(12)^-$
1288.50 *18*	4^+		2816.4 *4*	9^-	4419.7 *6*	(13)
1700.85 *16*	5^-		2834.8? *4*	8^-	4835.5 *7*	$(15)^-$
1936.70 *22*	6^+		2905.9 *4*	8^+	5451.6? *9*	$(17)^-$
2116.03 *19*	6^+		3220.7 *4*	10^-		
2211.42 *21*	7^-		3288.4 *4*	10^+		

† Based on angular-distribution and conversion-electron data.

γ(^{150}Gd)

When conversion-electron data were not available transition multipolarities were assumed to be stretched E2's if the angular-distribution coefficients' ratio A_2/A_0 was > 0.3.

E_γ†	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.	α[d]	Comments
≈78[e]		3366.8	$(11)^-$	3288.4	10^+			
95.5 *2*	20 *10*	2211.42	7^-	2116.03	6^+			
x97.4 *3*	20 *10*							
x129.5 *3*	7 *4*							
x132.9 *3*	30 *10*							
146.2 *3*	65 *35*	3366.8	$(11)^-$	3220.7	10^-			
x149.9 *3*	8 *4*							
154.1 *2*	10 *5*	1288.50	4^+	1134.35	3^-	[E1]	0.0910	α(K)=0.0769 *11*; α(L)=0.01110 *16*; α(M)=0.00240 *4*; α(N)=0.000546 *8*; α(O)=8.13×10^{-5} *12* α(P)=4.56×10^{-6} *7*; α(N+..)=0.000631 *10*
x159.4 *3*	≈2							
162.0 *2*	15 *5*	2554.44	8^+	2392.41	7^+	M1	0.513	α(K)=0.434 *7*; α(L)=0.0622 *9*; α(M)=0.01352 *20*; α(N)=0.00311 *5*; α(O)=0.000483 *7* α(P)=3.23×10^{-5} *5*; α(N+..)=0.00363 *6*
x165 *1*	≈4							
x174.9 *3*	17 *5*							
179.4 *3*	≈2	2116.03	6^+	1936.70	6^+	E2	0.320	α(K)=0.215 *4*; α(L)=0.0815 *13*; α(M)=0.0189 *3*; α(N)=0.00424 *7*; α(O)=0.000577 *9* α(P)=1.203×10^{-5} *18*; α(N+..)=0.00483 *8*
180.9 *3*	7 *3*	2392.41	7^+	2211.42	7^-			
x186.4 *3*	≈2							
x204.2 *3*	35 *10*							
232.4 *3*	25 *10*	4419.7	(13)	4187.3	$(12)^-$			
235.9#[e] *3*	≈5	1936.70	6^+	1700.85	5^-			
x246.7 *3*	10 *5*							
274.9 *3*	35 *10*	2211.42	7^-	1936.70	6^+	E1	0.0199	α(K)=0.01687 *24*; α(L)=0.00235 *4*; α(M)=0.000507 *8*; α(N)=0.0001158 *17*; α(O)=1.76×10^{-5} *3* α(P)=1.066×10^{-6} *16*; α(N+..)=0.0001344 *20*

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^{150}Sm(α,4nγ) E=50 MeV 1977Ha21 (continued)

$\gamma(^{150}Gd)$ (continued)

E_γ [†]	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.	α [d]	Comments
[x]301.8 *3*	10 *5*							
343.07 *10*	65. *20*	2554.44	8^+	2211.42	7^-	E1	0.01142	α(K)=0.00972 *14*; α(L)=0.001337 *19*; α(M)=0.000288 *4*; α(N)=6.59×10^{-5} *10* α(O)=1.005×10^{-5} *14*; α(P)=6.25×10^{-7} *9*; α(N+..)=7.66×10^{-5} *11*
[x]364.2 *3*								
404.3 *3*	150 *70*	3220.7	10^-	2816.4	9^-	M1+E2 [@]	0.034 *10*	α(K)=0.028 *9*; α(L)=0.0046 *7*; α(M)=0.00100 *12*; α(N)=0.00023 *3*; α(O)=3.5×10^{-5} *6* α(P)=2.0×10^{-6} *8*; α(N+..)=0.00027 *4*
412.4 *2*	2.1×10^2 *10*	1700.85	5^-	1288.50	4^+	E1	0.00734	α(K)=0.00626 *9*; α(L)=0.000852 *12*; α(M)=0.000184 *3*; α(N)=4.21×10^{-5} *6*; α(O)=6.43×10^{-6} *9* α(P)=4.07×10^{-7} *6*; α(N+..)=4.89×10^{-5} *7*
415.3 *2*	35 *15*	2116.03	6^+	1700.85	5^-	E1	0.00722	α(K)=0.00615 *9*; α(L)=0.000838 *12*; α(M)=0.000181 *3*; α(N)=4.14×10^{-5} *6*; α(O)=6.33×10^{-6} *9* α(P)=4.01×10^{-7} *6*; α(N+..)=4.81×10^{-5} *7*
438.37 *10*	110 *50*	2554.44	8^+	2116.03	6^+	E2	0.0199	α(K)=0.01598 *23*; α(L)=0.00305 *5*; α(M)=0.000680 *10*; α(N)=0.0001546 *22* α(O)=2.26×10^{-5} *4*; α(P)=1.057×10^{-6} *15*; α(N+..)=0.0001783 *25*
455.7 *2*	70 *40*	2392.41	7^+	1936.70	6^+	(M1+E2)	0.025 *7*	α(K)=0.021 *7*; α(L)=0.0032 *6*; α(M)=0.00071 *11*; α(N)=0.00016 *3*; α(O)=2.5×10^{-5} *5* α(P)=1.5×10^{-6} *6*; α(N+..)=0.00019 *4*
[x]465.8 *3*	15 *5*							
496.30 *10*	440 *20*	1134.35	3^-	638.05	2^+	E1 [c]	0.00479	α(K)exp=0.0033 *15* α(K)=0.00409 *6*; α(L)=0.000552 *8*; α(M)=0.0001189 *17*; α(N)=2.72×10^{-5} *4*; α(O)=4.18×10^{-6} *6* α(P)=2.69×10^{-7} *4*; α(N+..)=3.17×10^{-5} *5*
510 *1*	600 [a] *CA*	2211.42	7^-	1700.85	5^-	E2	0.01324	α(K)=0.01079 *16*; α(L)=0.00192 *3*; α(M)=0.000425 *7*; α(N)=9.69×10^{-5} *15*; α(O)=1.434×10^{-5} *22* α(P)=7.25×10^{-7} *11*; α(N+..)=0.0001120 *17*
[x]547.6 *3*	10 *5*							
550.3 *3*	155 *50*	3366.8	$(11)^-$	2816.4	9^-	‡&		
566.52 *10*	425 *20*	1700.85	5^-	1134.35	3^-	E2 [c]	0.01011	α(K)exp=0.0083 *8* α(K)=0.00830 *12*; α(L)=0.001414 *20*; α(M)=0.000312 *5*; α(N)=7.12×10^{-5} *10* α(O)=1.062×10^{-5} *15*; α(P)=5.63×10^{-7} *8*; α(N+..)=8.24×10^{-5} *12*
605.0 *3*	425 *50*	2816.4	9^-	2211.42	7^-	E2 [c]	0.00859	α(K)exp=0.0069 *10* α(K)=0.00708 *10*; α(L)=0.001176 *17*; α(M)=0.000259 *4*; α(N)=5.92×10^{-5} *9*; α(O)=8.86×10^{-6} *13* α(P)=4.82×10^{-7} *7*; α(N+..)=6.85×10^{-5} *10*
616.1 [e] *5*	30 *15*	5451.6?	$(17)^-$	4835.5	$(15)^-$			
623.4 [e] *3*	30 *10*	2834.8?	8^-	2211.42	7^-	@		
[x]633.0 *5*	25 *15*							

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^{150}Sm(α,4nγ) E=50 MeV 1977Ha21 (continued)

$\gamma(^{150}Gd)$ (continued)

E_γ [†]	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.	α [d]	Comments
638.05 *10*	1000	638.05	2^+	0.0	0^+	E2	0.00754	α(K)exp=0.00625 α(K)=0.00624 *9*; α(L)=0.001017 *15*; α(M)=0.000224 *4*; α(N)=5.11×10^{-5} *8*; α(O)=7.68×10^{-6} *11* α(P)=4.26×10^{-7} *6*; α(N+..)=5.92×10^{-5} *9* Mult.: E2 assignment adopted from 1971Ke06.
648.4 *3*	185 *50*	1936.70	6^+	1288.50	4^+	E2[c]	0.00726	α(K)exp=0.0062 *10* α(K)=0.00601 *9*; α(L)=0.000974 *14*; α(M)=0.000214 *3*; α(N)=4.89×10^{-5} *7*; α(O)=7.36×10^{-6} *11* α(P)=4.11×10^{-7} *6*; α(N+..)=5.67×10^{-5} *8*
650.4 *3*	540 *50*	1288.50	4^+	638.05	2^+	E2	0.00720	α(K)=0.00597 *9*; α(L)=0.000966 *14*; α(M)=0.000212 *3*; α(N)=4.85×10^{-5} *7*; α(O)=7.30×10^{-6} *11* α(P)=4.08×10^{-7} *6*; α(N+..)=5.62×10^{-5} *8*
[x]661.5 *3*	15 *10*							
[x]677.5 *3*	25 *10*							
[x]689.5 *5*	15 *10*							
704.0 *5*	80 *40*	4835.5	$(15)^-$	4131.5	$(13)^-$	‡&		
734.0 *3*	120 *20*	3288.4	10^+	2554.44	8^+	E2[c]	0.00542	α(K)exp=0.0040 *7* α(K)=0.00452 *7*; α(L)=0.000705 *10*; α(M)=0.0001544 *22*; α(N)=3.53×10^{-5} *5*; α(O)=5.34×10^{-6} *8* α(P)=3.11×10^{-7} *5*; α(N+..)=4.10×10^{-5} *6*
764.7 *2*	160 *20*	4131.5	$(13)^-$	3366.8	$(11)^-$	E2[c]	0.00494	α(K)exp=0.0037 *7* α(K)=0.00412 *6*; α(L)=0.000636 *9*; α(M)=0.0001391 *20*; α(N)=3.18×10^{-5} *5*; α(O)=4.82×10^{-6} *7* α(P)=2.84×10^{-7} *4*; α(N+..)=3.69×10^{-5} *6*
[x]775.1 *3*	45 *10*							
[x]779.3 *5*	≈10							
789.9 *4*	50 *10*	2905.9	8^+	2116.03	6^+	E2	0.00459	α(K)=0.00384 *6*; α(L)=0.000587 *9*; α(M)=0.0001282 *18*; α(N)=2.94×10^{-5} *5*; α(O)=4.45×10^{-6} *7* α(P)=2.64×10^{-7} *4*; α(N+..)=3.41×10^{-5} *5*
[x]795.7 *3*	50 *10*							
[x]800.0 *5*	≈5							
[x]816.8 *3*	85 *15*					E2		
827.48 *10*	140 *20*	2116.03	6^+	1288.50	4^+	E2[c]	0.00414	α(K)exp=0.0043 *8* α(K)=0.00347 *5*; α(L)=0.000524 *8*; α(M)=0.0001143 *16*; α(N)=2.62×10^{-5} *4*; α(O)=3.98×10^{-6} *6* α(P)=2.39×10^{-7} *4*; α(N+..)=3.04×10^{-5} *5*
831.0 *5*	40 *10*	2767.7	(8^+)	1936.70	6^+	[E2]‡[b]	0.00410	α(K)=0.00344 *5*; α(L)=0.000518 *8*; α(M)=0.0001131 *16*; α(N)=2.59×10^{-5} *4*; α(O)=3.94×10^{-6} *6* α(P)=2.37×10^{-7} *4*; α(N+..)=3.01×10^{-5} *5*
[x]859.8 *3*	20 *10*							
[x]936.4 *3*	20 *10*							
966.6 *3*	35 *10*	4187.3	$(12)^-$	3220.7	10^-	E2[c]	0.00296	α(K)exp=0.0032 *10* α(K)=0.00249 *4*; α(L)=0.000363 *5*; α(M)=7.90×10^{-5} *11*; α(N)=1.81×10^{-5} *3*; α(O)=2.77×10^{-6} *4* α(P)=1.725×10^{-7} *25*; α(N+..)=2.11×10^{-5} *3*
[x]979.0 *3*	≈10							

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^{150}Sm(α,4nγ) E=50 MeV 1977Ha21 (continued)

$\gamma(^{150}Gd)$ (continued)

† 1977Ha21 report a single set of values for both their (α,4nγ) and their 5.8 min ε-decay experiments. If averaging data, care should be taken to use this data only once.
‡ Characterized as stretched E2 even though the conversion-electron data do not provide a clear choice between an E1 and E2 assignment.
# This transition was placed in decay scheme on basis of energy alone.
@ Data exclude E1.
& Data exclude M1.
a Not measurable from data. Value estimated from level scheme.
b Data exclude M1. Stretched E2 is assumed.
c Assignment of mult is based on α(K)exp of 1977Ha21.
d Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.
e Placement of transition in the level scheme is uncertain.
x γ ray not placed in level scheme.

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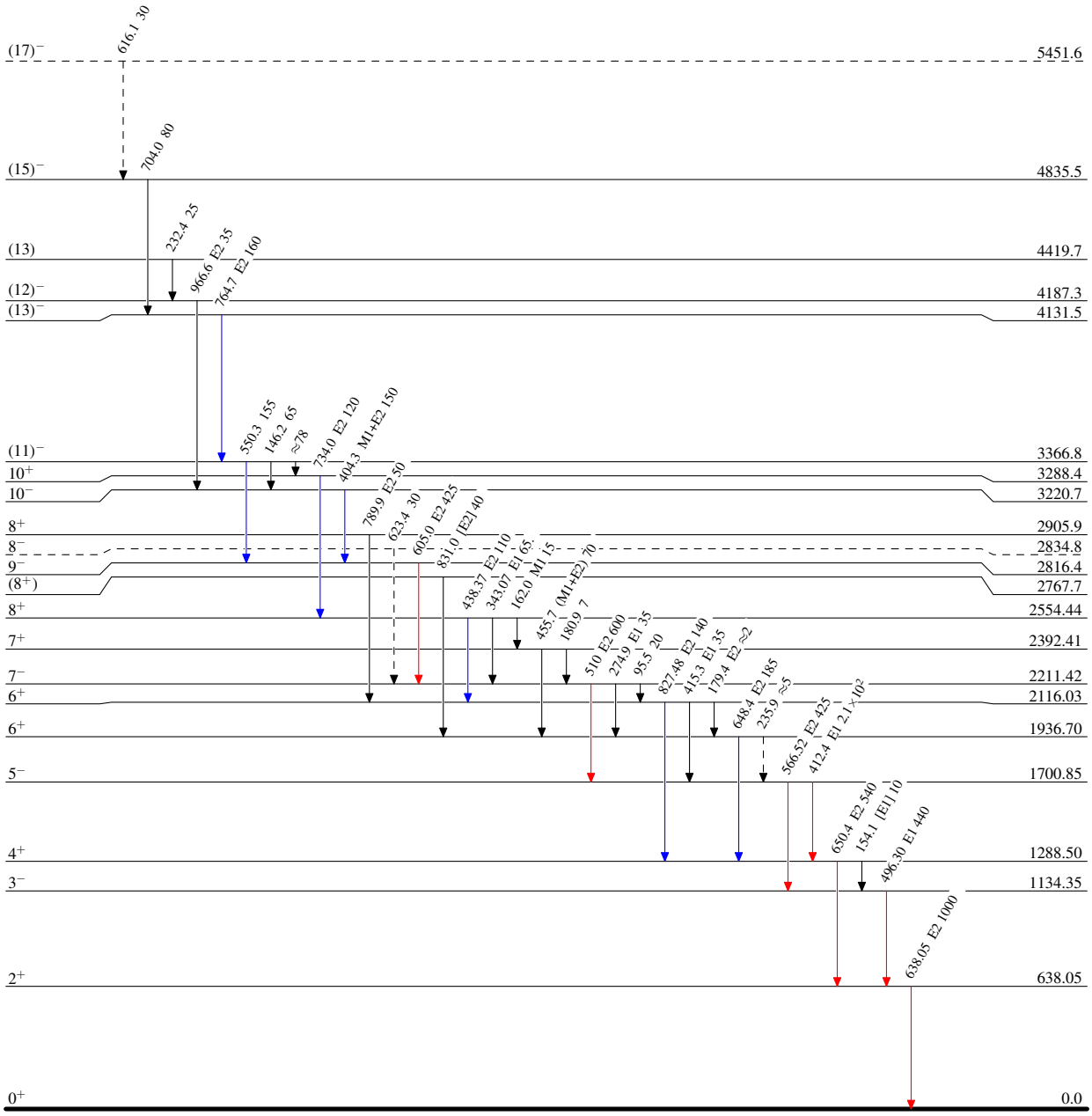
Level Scheme

Intensities: Type not specified

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)



$^{150}_{64}Gd_{86}$