^{151}Eu(α,4nγ) 1978Ke12

History			
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	NDS 110, 1 (2009)	20-Nov-2008

1978Ke12: ^{151}Eu(α,4nγ) E(α)=45-55 MeV and ^{151}Eu(^{3}He,3nγ) E(^{3}He)=24-32 MeV. Measured γ, $\gamma\gamma$, ce, $\gamma(\theta)$ in (α,4nγ) and γ, $\gamma\gamma$, $\gamma\gamma$(t), excitation functions.

^{151}Tb Levels

E(level)†	Jπ‡	$T_{1/2}$	E(level)†	Jπ‡	E(level)†	Jπ‡
0.0	1/2(+)		2120.4 *5*	(23/2−)	3197.2 *6*	(31/2+)
23.0 *3*	3/2(+)		2180.6 *5*	(25/2−)	3274.1 *6*	(33/2+)
72.5 *3*	(5/2+)		2219.8 *5*	(23/2+)	3287.7? *6*	
99.6 *4*	(11/2−)	25 s *3*	2375.4 *5*	(27/2−)	3808.5 *6*	(35/2−)
703.8 *4*	(15/2−)		2468.6 *5*	(25/2+)	3900.4 *6*	(35/2+)
887.4 *4*	(13/2−)		2782.4 *5*	(27/2+)	4148.0 *7*	(37/2+)
1096.6 *4*	(15/2+)		2847.3 *5*	(29/2+)	4564.4 *7*	(39/2+)
1319.6 *4*	(19/2−)		3108.1? *6*		4774.1 *7*	(41/2+)
1693.4 *5*	(19/2+)		3115.7 *5*	(31/2+)	5162.7 *8*	(45/2+)
2002.0 *5*	(23/2−)		3128.8 *6*	(31/2−)		
2045.7 *5*	(21/2+)		3159.1? *6*	(29/2−)		

† From least-squares fit to Eγ's.
‡ From 'Adopted Levels'.

γ(^{151}Tb)

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.	α†	Comments
23.0 *3*	1.2	23.0	3/2(+)	0.0	1/2(+)	M1(+E2)	$9.\times10^2$ *9*	α(L)=7.E2 7; α(M)=1.7×10^2 *17*; α(N+..)=4.E1 4 α(N)=4.E1 4; α(O)=5 *5*; α(P)=0.007 *4*
27.1 *3*		99.6	(11/2−)	72.5	(5/2+)	E3	8.7×10^4 *7*	α(L)=6.4×10^4 *5*; α(M)=1.83×10^4 *14*; α(N+..)=4.7×10^3 *4* α(N)=4.2×10^3 *3*; α(O)=4.9×10^2 *4*; α(P)=0.261 *18*
49.5 *3*	8.4	72.5	(5/2+)	23.0	3/2(+)	M1(+E2)	22 *20*	α(L)=17 *15*; α(M)=4 *4*; α(N+..)=1.0 *9* α(N)=0.9 *8*; α(O)=0.12 *10*; α(P)=0.0007 *4*
65.1 *3*	1.2	2847.3	(29/2+)	2782.4	(27/2+)	(M1)	7.58 *15*	α(K)=6.38 *13*; α(L)=0.938 *19*; α(M)=0.205 *4*; α(N+..)=0.0552 *11* α(N)=0.0474 *10*; α(O)=0.00729 *15*; α(P)=0.000478 *10*
72.5‡ *3*		72.5	(5/2+)	0.0	1/2(+)			
158.4 *3*	6.5	3274.1	(33/2+)	3115.7	(31/2+)			
178.6 *1*	21	2180.6	(25/2−)	2002.0	(23/2−)	M1,E2	0.38 *5*	α(K)=0.29 *7*; α(L)=0.071 *19*; α(M)=0.016 *5*; α(N+..)=0.0042 *12* α(N)=0.0037 *11*; α(O)=0.00052 *12*; α(P)=1.9×10^{-5} *8* Additional information 6.
194.8 *1*	18	2375.4	(27/2−)	2180.6	(25/2−)	M1,E2	0.29 *5*	α(K)=0.23 *6*; α(L)=0.052 *11*; α(M)=0.012 *3*; α(N+..)=0.0031 *7* α(N)=0.0027 *6*; α(O)=0.00038 *7*; α(P)=1.5×10^{-5} *6* Additional information 8.
209.2 *2*	9.8	1096.6	(15/2+)	887.4	(13/2−)			

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^{151}Eu(α,4nγ) 1978Ke12 (continued)

$\gamma(^{151}Tb)$ (continued)

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.	α[†]	Comments
248.8 *3*	8.0	2468.6	(25/2$^+$)	2219.8	(23/2$^+$)	(M1,E2)	0.14 *3*	α(K)=0.11 *4*; α(L)=0.0222 *15*; α(M)=0.0050 *5*; α(N+..)=0.00132 *10* α(N)=0.00114 *10*; α(O)=0.000166 *5*; α(P)=8.E−6 *3* Additional information 9.
268.4 *1*	17	3115.7	(31/2$^+$)	2847.3	(29/2$^+$)	M1,E2	0.11 *3*	α(K)=0.09 *3*; α(L)=0.0173 *5*; α(M)=0.00388 *20*; α(N+..)=0.00103 *4* α(N)=0.00089 *4*; α(O)=0.000130 *3*; α(P)=6.4×10^{-6} *24* Additional information 11.
287 *3*	1.5	2468.6	(25/2$^+$)	2180.6	(25/2$^-$)			
313.9 *3*	1.8	2782.4	(27/2$^+$)	2468.6	(25/2$^+$)			
325.7[‡] *3*	1.1	3108.1?		2782.4	(27/2$^+$)			
349.9 *3*	2.4	3197.2	(31/2$^+$)	2847.3	(29/2$^+$)			
352.4 *3*	1.8	2045.7	(21/2$^+$)	1693.4	(19/2$^+$)			
378.6 *3*	7.7	2847.3	(29/2$^+$)	2468.6	(25/2$^+$)			
388.6 *3*	2.0	5162.7	(45/2$^+$)	4774.1	(41/2$^+$)			
392.8 *1*	30	1096.6	(15/2$^+$)	703.8	(15/2$^-$)	E1	0.00858	α(K)=0.00730 *11*; α(L)=0.001007 *15*; α(M)=0.000218 *3*; α(N+..)=5.82×10^{-5} *9* α(N)=5.02×10^{-5} *7*; α(O)=7.60×10^{-6} *11*; α(P)=4.71×10^{-7} *7* Additional information 2.
440.4 *3*	5.2	3287.7?		2847.3	(29/2$^+$)			
466 *3*	2.1	2468.6	(25/2$^+$)	2002.0	(23/2$^-$)			
472.0 *3*	4.8	2847.3	(29/2$^+$)	2375.4	(27/2$^-$)			
526.4 *1*	33	2219.8	(23/2$^+$)	1693.4	(19/2$^+$)	(E2)	0.01273	α(K)=0.01035 *15*; α(L)=0.00186 *3*; α(M)=0.000414 *6*; α(N+..)=0.0001095 *16* α(N)=9.48×10^{-5} *14*; α(O)=1.392×10^{-5} *20*; α(P)=6.95×10^{-7} *10* Additional information 7.
562.6 *1*	24	2782.4	(27/2$^+$)	2219.8	(23/2$^+$)	E2	0.01075	α(K)=0.00878 *13*; α(L)=0.001533 *22*; α(M)=0.000341 *5*; α(N+..)=9.02×10^{-5} *13* α(N)=7.81×10^{-5} *11*; α(O)=1.152×10^{-5} *17*; α(P)=5.93×10^{-7} *9* Additional information 10.
596.8 *1*	39	1693.4	(19/2$^+$)	1096.6	(15/2$^+$)	E2	0.00928	α(K)=0.00762 *11*; α(L)=0.001298 *19*; α(M)=0.000288 *4*; α(N+..)=7.64×10^{-5} *11* α(N)=6.61×10^{-5} *10*; α(O)=9.79×10^{-6} *14*; α(P)=5.17×10^{-7} *8* Additional information 4.
604.2 *1*	100	703.8	(15/2$^-$)	99.6	(11/2$^-$)	E2	0.00900	α(K)=0.00740 *11*; α(L)=0.001255 *18*; α(M)=0.000279 *4*; α(N+..)=7.38×10^{-5} *11* α(N)=6.39×10^{-5} *9*; α(O)=9.46×10^{-6} *14*; α(P)=5.02×10^{-7} *7* Additional information 1.
615.8 *1*	50	1319.6	(19/2$^-$)	703.8	(15/2$^-$)	E2	0.00860	α(K)=0.00707 *10*; α(L)=0.001191 *17*; α(M)=0.000264 *4*; α(N+..)=7.00×10^{-5} *10* α(N)=6.06×10^{-5} *9*; α(O)=8.99×10^{-6} *13*; α(P)=4.81×10^{-7} *7* Additional information 3.
626.1 *3*	3.4	4774.1	(41/2$^+$)	4148.0	(37/2$^+$)			
664.0 *3*	2.4	4564.4	(39/2$^+$)	3900.4	(35/2$^+$)			
679.7 *3*	6.0	3808.5	(35/2$^-$)	3128.8	(31/2$^-$)			
682.4 *1*	35	2002.0	(23/2$^-$)	1319.6	(19/2$^-$)	E2	0.00673	α(K)=0.00557 *8*; α(L)=0.000905 *13*;

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^{151}Eu(α,4nγ) 1978Ke12 (continued)

$\gamma(^{151}Tb)$ (continued)

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.	α[†]	Comments
								α(M)=0.000200 *3*; α(N+..)=5.31×10^{-5} *8* α(N)=4.59×10^{-5} *7*; α(O)=6.85×10^{-6} *10*; α(P)=3.81×10^{-7} *6* Additional information 5.
726.1 *3*	3.7	2045.7	(21/2$^+$)	1319.6	(19/2$^-$)			
753.4 *3*	8.7	3128.8	(31/2$^-$)	2375.4	(27/2$^-$)			
784.7 *3*	8.8	3900.4	(35/2$^+$)	3115.7	(31/2$^+$)			
787.8 *1*	12	887.4	(13/2$^-$)	99.6	(11/2$^-$)	(M1+E2)	0.0068 *20*	α(K)=0.0058 *18*; α(L)=0.00083 *21*; α(M)=0.00018 *5*; α(N+..)=4.9×10^{-5} *12* α(N)=4.2×10^{-5} *10*; α(O)=6.4×10^{-6} *17*; α(P)=4.1×10^{-7} *14*
800.8 *2*	9.4	2120.4	(23/2$^-$)	1319.6	(19/2$^-$)			
[x]823.2 *3*	1.4							Deexcitation from a 1527 level (1978Ke12) seems incorrect. a γ ray of a similar energy deexcites a 5985 level (1994Pe17).
873.9 *3*	4.3	4148.0	(37/2$^+$)	3274.1	(33/2$^+$)			
978.5 *3*	2.3	3159.1?	(29/2$^-$)	2180.6	(25/2$^-$)			

[†] 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.
[‡] Placement of transition in the level scheme is uncertain.
[x] γ ray not placed in level scheme.

^{151}Eu(α,4nγ) 1978Ke12

Level Scheme

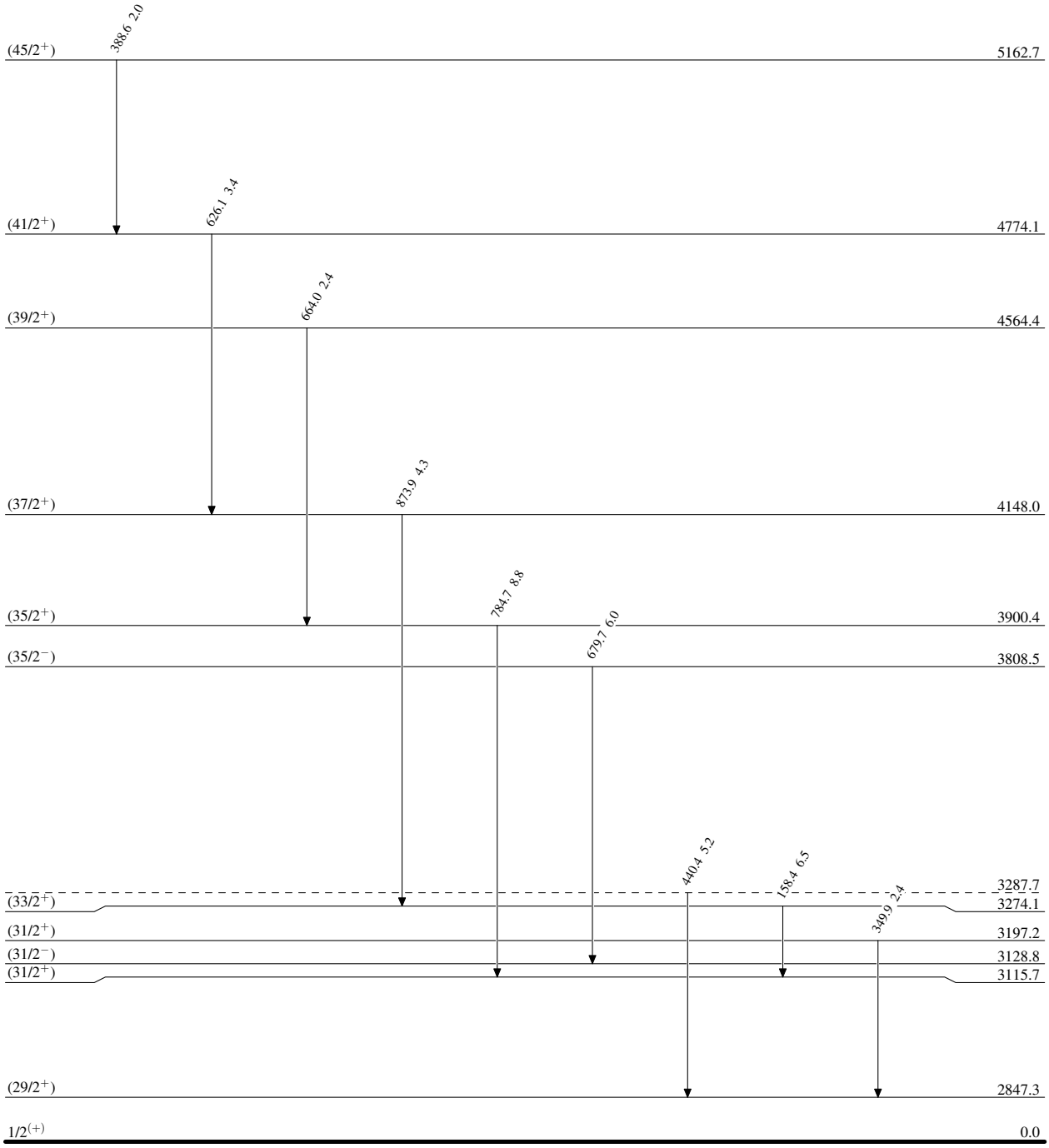
Intensities: Relative I_γ

Legend

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

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

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

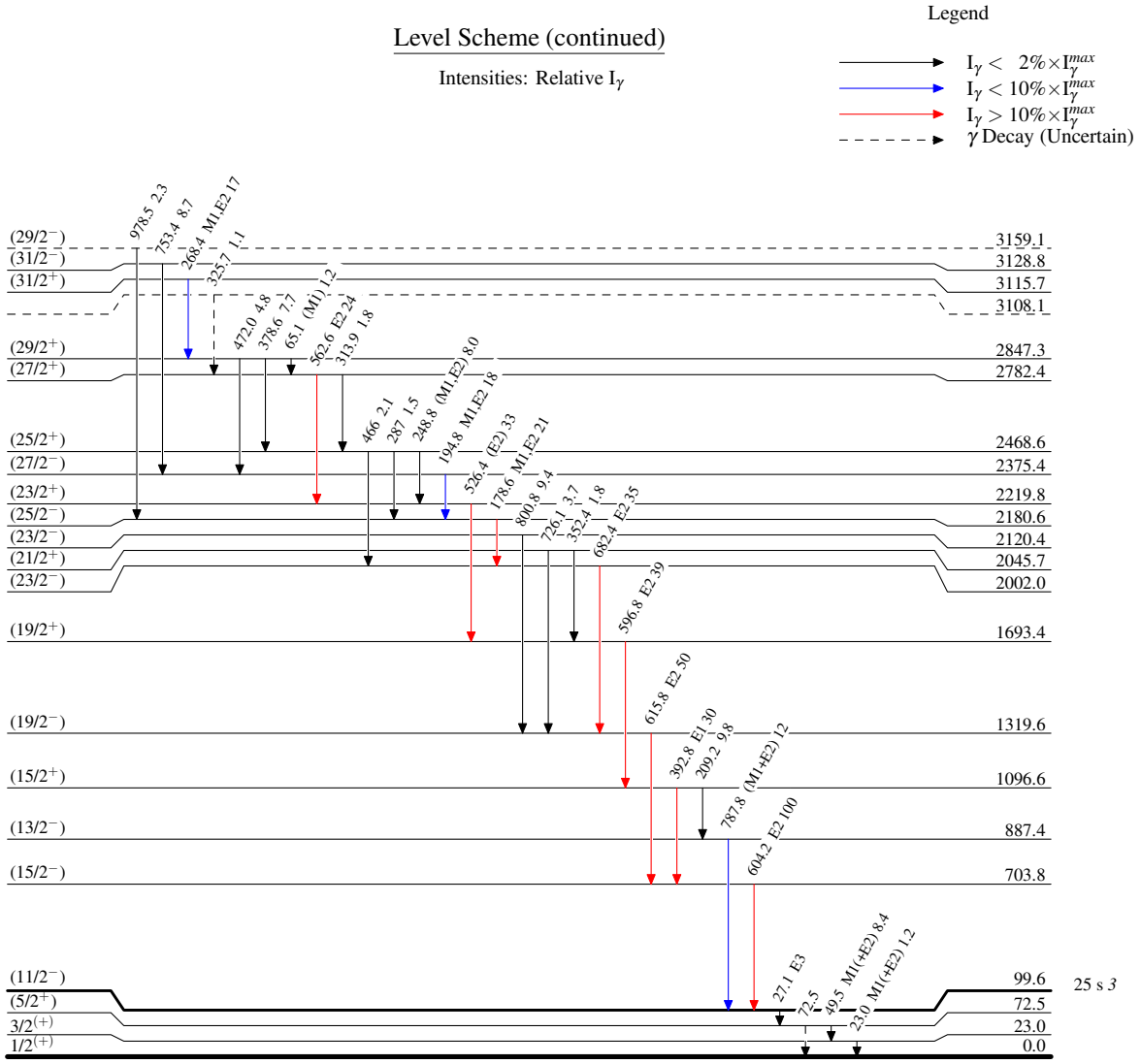


$^{151}_{65}Tb_{86}$

^{151}Eu(α,4nγ) 1978Ke12

Level Scheme (continued)

Intensities: Relative I_γ



$^{151}_{65}Tb_{86}$