^{155}Dy IT decay (6 μs)

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 160, 1 (2019)	21-Oct-2019

Parent: ^{155}Dy: E=234.33 *3*; J^π=11/2$^-$; $T_{1/2}$=6 μs *1*; %IT decay=100.0

1970Bo02: the source was produced in the ^{155}Gd(^{3}He,3nγ) reaction, using a pulsed beam. Measured Eγ, Iγ, Ice, delayed γ, delayed ce. The activity was assigned to ^{155}Dy by comparison of the measured Eγ with known values reported in the ^{155}Ho ε decay.

Although 1970Bo02 correctly associated the isomeric state with the 11/2[505] Nilsson orbital, they did not propose a decay scheme for it. The decay scheme shown here is that worked up by the evaluator and relies heavily on the level-scheme information obtained from the ^{155}Ho ε decay.

^{155}Dy Levels

E(level)†	J^π†	$T_{1/2}$‡	Comments
0.0	3/2$^-$	9.9 h *2*	
39.384 *9*	5/2$^-$	3.34 ns *3*	
86.767 *12*	7/2$^-$	1.1 ns *2*	
132.195 *22*	9/2$^+$	51 ns *3*	
154.48 *5*	13/2$^+$		
225.285 *16*	9/2$^-$		
234.33 *3*	11/2$^-$	6 μs *1*	%IT=100 $T_{1/2}$: from 1970Bo02, γ(t).

† From adopted values.

‡ From adopted values, unless noted otherwise.

γ(^{155}Dy)

The γ-ray properties are those as given in the ^{155}Ho ε decay data set.

Relative γ-ray intensities from decay of 6-μs ^{155}Dy (1970Bo02

Eγ(keV)	Iγ	Eγ(keV)	Iγ
37	9 5	88	2.4 *12*
47×	37 20	103	9 2
68	1.4 *10*	139	21 3
79	9.5 *20*	147	16 2

×Iγ value includes a contribution from K x rays

E_γ	I_γ [†‡@]	E_i(level)	J^π_i	E_f	J^π_f	Mult.	δ	α [#]	Comments
9.1 *1*	0.047 *5*	234.33	11/2$^-$	225.285	9/2$^-$	M1+E2	0.0189 *21*	≈530	
22.15 *5*	0.0075 *14*	154.48	13/2$^+$	132.195	9/2$^+$	[E2]		2.39×10^3 *5*	α(L)=1.84×10^3 *4*; α(M)=437 *8* α(N)=97.2 *18*; α(O)=11.32 *21*; α(P)=0.00350 *7*
39.39 *2*	5.5 *3*	39.384	5/2$^-$	0.0	3/2$^-$	M1+E2	0.222 *4*	11.9 *3*	α(L)=9.26 *21*; α(M)=2.13 *5* α(N)=0.484 *12*; α(O)=0.0629 *14*; α(P)=0.00183 *3*
45.38 *5*	44 *32*	132.195	9/2$^+$	86.767	7/2$^-$	E1		0.467	α(L)=0.366 *6*; α(M)=0.0806 *12* α(N)=0.0180 *3*; α(O)=0.00230 *4*; α(P)=8.14×10^{-5} *12*
47.37 *2*	13.4 *15*	86.767	7/2$^-$	39.384	5/2$^-$	M1+E2	0.115 *10*	4.03 *14*	α(L)=3.14 *11*; α(M)=0.702 *25* α(N)=0.161 *6*; α(O)=0.0227 *7*; α(P)=0.001093 *16*
79.72 *5*	4.3 *4*	234.33	11/2$^-$	154.48	13/2$^+$	E1+M2	0.23 *3*	3.3 *7*	α(K)=2.4 *5*; α(L)=0.66 *16*; α(M)=0.16 *4* α(N)=0.036 *9*; α(O)=0.0051 *12*; α(P)=0.00024 *6*
86.75 *2*	4.6 *2*	86.767	7/2$^-$	0.0	3/2$^-$	E2		4.63	α(K)=1.567 *22*; α(L)=2.36 *4*; α(M)=0.566 *8* α(N)=0.1269 *18*; α(O)=0.01515 *22*; α(P)=6.50×10^{-5} *10*
102.16 *3*	9.1 *11*	234.33	11/2$^-$	132.195	9/2$^+$	E1+M2	0.45 *6*	3.8 *8*	α(K)=2.8 *6*; α(L)=0.74 *16*; α(M)=0.17 *4* α(N)=0.040 *9*; α(O)=0.0057 *13*; α(P)=0.00028 *6* Additional information 1.
138.46 *4*	10.6 *11*	225.285	9/2$^-$	86.767	7/2$^-$	E2(+M1)	>2.4	0.843 *15*	α(K)=0.49 *3*; α(L)=0.272 *13*; α(M)=0.064 *4* α(N)=0.0145 *8*; α(O)=0.00179 *8*; α(P)=2.26×10^{-5} *22*
147.63 *6*	7.5 *11*	234.33	11/2$^-$	86.767	7/2$^-$	[E2]		0.666	α(K)=0.388 *6*; α(L)=0.215 *3*; α(M)=0.0509 *8* α(N)=0.01146 *17*; α(O)=0.001412 *20*; α(P)=1.721×10^{-5} *25*
185.89 *2*	4.1 *3*	225.285	9/2$^-$	39.384	5/2$^-$	E2		0.302	α(K)=0.197 *3*; α(L)=0.0810 *12*; α(M)=0.0190 *3* α(N)=0.00430 *6*; α(O)=0.000540 *8*; α(P)=9.25×10^{-6} *13*

$\gamma(^{155}Dy)$ (continued)

† The relative Iγ values for the γ′s deexciting a given level are those observed in the ^{155}Ho ε decay. The Iγ values of the γ′s deexciting a given level, relative to those deexciting other levels, have been adjusted to provide a suitable intensity balance at each level.

‡ The γ intensity scale has been chosen so that the sum of the I(γ+ce) values of the transitions deexciting the 6−μs isomer is 100%. Note that these values depend significantly on the I(γ+ce) value of the 9.1 γ. This value, relative to those of the other transitions deexciting the isomer, was chosen to reproduce the relative Iγ values of the 138 and the 147 (and 79) γ′s. It is much smaller than what would be expected from the ce data of 1979Al31 and 1979Ab18 on the ε decay of ^{155}Ho. See the discussion under the 9.1 γ in the ^{155}Ho ε decay data set.

Additional information 2.

@ Absolute intensity per 100 decays.

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