

$^{158}\text{Gd}(\text{pol } t, \alpha)$ 1979Bu05

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 132, 1 (2016)	4-Dec-2015

Data are from reaction with $E_t=17$ MeV and α 's measured in magnetic spectrometer with FWHM of 15-16 keV. Cross sections (with uncertainties in relative values of 10% and in absolute values of 20%) are given for all levels and nuclear structure factors are given for some levels.

 ^{157}Eu Levels

E(level) [†]	J^π [‡]	S [#]	Comments
0.0 [@]	5/2 ⁺	0.03	
79 [@] 4	7/2 ⁺	0.88	
177 [@] 4	9/2 ⁺	0.08	
197 ^{&} 4	5/2 ⁻	0.01	
266 ^{&} 4	7/2 ⁻	0.09	
≈296 [@]	(11/2 ⁺)		
350 ^{&} 4	9/2 ⁻	0.22	
396 ^a 4	3/2 ⁺	0.04	
457 ^a 4	5/2 ⁺	0.28	S: Unresolved doublet in this reaction. S was determined by assuming the same relative 5/2,3/2[411] to 11/2,5/2[532] population as was observed in the levels of ^{159}Eu (1979Bu05). Levels are resolved in ^{157}Sm β^- decay.
457 ^{&} 4	11/2 ⁻	1.55	Unresolved doublet in this reaction.
539 ^a 4	7/2 ⁺	0.07	
584 ^{&} 4	(13/2 ⁻)		
645 ^a 4	9/2 ⁺	0.09	
724 ^{&} 4	(15/2 ⁻)		
975 4	3/2 ⁺	0.08	
1057 ^b 4	1/2 ⁺	≈0.10	E(level): Not clearly resolved from level at 1073.
1073 4			
≈1098			
1145 ^b 4	5/2 ⁺ , 3/2 ⁺	0.33	E(level): A probable doublet containing both the 5/2 ⁺ and 3/2 ⁺ members of this rotational band, as expected from the predicted decoupling parameter of a $\approx +1.0$.
≈1247			
≈1300			
1322 ^b 4	(7/2 ⁺)	0.31	
1369 4			
1404 4			
≈1463			
1562 4			
1603 4			
1635 4			
1711 4			
1823 4			
1850 4			
1945 4			
2035 4			

[†] 1979Bu05 estimate uncertainties as ≤ 4 keV; evaluator has assigned uncertainty of 4 keV to all levels.

[‡] The J^π and Nilsson orbital assignments were deduced (1979Bu05) by comparison of the measured angular distributions and analyzing powers with the DWBA predictions; this involves model-dependent considerations. The assignments for the levels at 584 and 724 keV are based primarily on the energy spacings.

 $^{158}\text{Gd}(\text{pol t}, \alpha)$ [1979Bu05](#) (continued)

 ^{157}Eu Levels (continued)

These experimental nuclear structure factors were obtained ([1979Bu05](#)) by dividing the measured cross sections by $2*N*(d\sigma/d\Omega)_{\text{DWBA}}$ with $N=23$. Uncertainties are 30-50%.

@ Band(A): 5/2[413] band.

& Band(B): 5/2[532] band.

^a Band(C): 3/2[411] band.

^b Band(D): 1/2[420] band.

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Band(D): 1/2[420] band

(7/2⁺) 13225/2⁺, 3/2⁺ 11451/2⁺ 1057

Band(B): 5/2[532] band

(15/2⁻) 724

Band(C): 3/2[411] band

9/2⁺ 645(13/2⁻) 5847/2⁺ 53911/2⁻ 4575/2⁺ 4573/2⁺ 396

Band(A): 5/2[413] band

9/2⁻ 350(11/2⁺) ≈2967/2⁻ 2669/2⁺ 1775/2⁻ 1977/2⁺ 795/2⁺ 0.0 $^{157}_{63}\text{Eu}_{94}$