

¹⁵⁸Dy(t,p) 1988Bu08

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 176, 1 (2021)	1-May-2021

Additional information 1.

Because of the low natural abundance (<0.1%) of ¹⁵⁸Dy, commercially available samples of this nuclide have enrichments of only a few percent. For use in this experiment (as well as in others), a second isotopic separation was carried out using as input this enriched material, resulting in ¹⁵⁸Dy samples with an isotopic purity believed to be ≥99%.

E(t)=17 MeV. Emitted protons were detected in photographic emulsions following analysis in an Enge split-pole magnetic spectrograph. Peak widths varied from ≈15 keV in the best cases to ≈20 keV in the poorest spectra. Measured energy spectra and dσ/dΩ at 7.5° intervals from θ=7.5° to θ=67.5°. DWBA analysis.

Errors in individual (relative) cross-section values include contributions from statistical errors in peak fitting and from reproducibility of data (≈10%) as determined from other, similar, experiments. This information is shown only graphically by 1988Bu08 and is thus not given here. Errors in the absolute cross sections are estimated by 1988Bu08 to be ≈20% for the largest peaks, and arise mainly from the uncertainties in the normalization process.

¹⁶⁰Dy Levels

E(level)	J ^π @	L	dσ/dΩ(μb/sr) [‡]	Comments
0&	0 ⁺	0	400	
87&	2 ⁺		27	
285&	4 ⁺		≤7	
583&	6 ⁺		≤2	
968 ^a	2 ⁺		3	
1157 ^a	4 ⁺		≤15	
1286 [†]	3 ⁻		20	
1348	2 ⁺		2	
1399	3 ⁻		2	
1457 ^b	0 ⁺	0	10	
≈1513 ^b	2 ⁺		≤2	Assigned as the 2 ⁺ member of the S band in ¹⁶⁰ Ho ε decay.
1617			≤2	
1657			≤4	
1709	0 ⁺	0	21	when corrected for the Q value dependence of the (t,p) cross section, this value is reduced from 21 to 19 μb/sr (1988Bu08).
1758			≤3	
1875			≤8	
1932			≤3	
2046			#	
2214			#	
2296			#	

[†] A peak corresponding to the 1275 level seen in (p,t) would be expected to lie in the tail of the 1286-keV peak and was thus not observed. 1988Bu08 estimate an upper limit of 4 μb/sr for the (t,p) cross section for population of this level.

[‡] Values at θ=30°.

Peak indicated by 1988Bu08 as “obscured”, and no cross-section value is given.

@ From 1988Bu08, based on previously established values. These are the same as the Adopted Values.

& Band(A): ground-state rotational band.

^a Band(B): γ-vibrational band.

^b Band(C): S, or ‘Super’ band.

$^{158}\text{Dy}(\text{t,p})$ **1988Bu08****Band(C): S, or 'Super'
band**2⁺ ----- ≈1513**Band(B): γ -vibrational
band**0⁺ 14574⁺ 1157**Band(A): Ground-state
rotational band**2⁺ 9686⁺ 5834⁺ 2852⁺ 870⁺ 0