

$^{155}\text{Gd}(d,d')$ 1971St03

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

Additional information 1.

$E(d)=12$ MeV. Isotope-separated ^{155}Gd targets, $\approx 50 \mu\text{g}/\text{cm}^2$ thick, were deposited on $40\text{-}\mu\text{g}/\text{cm}^2$ thick C foils. Scattered deuterons were analyzed in a magnetic spectrograph and detected in photographic emulsions. Energy resolution (from experiments carried out under comparable conditions) is ≈ 8 keV. Excitation energies have an accuracy of 2 keV. Measured $\sigma(E(d'),\theta)$ at angles of 60° , 90° and 125° .

Other: 1981St09 studied the (d,d') reaction at deuteron energies near the Coulomb barrier for several odd-mass deformed nuclei, including ^{155}Gd . The results of this study showed a correlation between the transferred angular momentum and the average form of the angular distribution of the scattered particles.

1971St03 quote values of $B(E2)$ calculated from the 90° cross sections assuming that $(d\sigma/d\Omega)/B(E2)=1.12$ for rotational transitions and 0.9 for other ones. Similarly, they quote $B(E3)$ values calculated assuming $(d\sigma/d\Omega)/B(E3)=1.38$.

1971St03 list band and configuration assignments for a number of the populated levels. They state that these are based largely on the (d,t) or (d,t) reaction data available to them. Since these are not independently established, they are not listed here. Note that these studies place the $5/2[523]$ band lower in the level scheme (320 keV) than later studies indicate (454 keV).

 ^{155}Gd Levels

E(level)	S ^{†‡}	E(level)	S ^{†‡}	E(level)	S ^{†‡}	E(level)	S ^{†‡}
0.0	12100	590 2	16	983 2	6	1316 2	3
60 2	1410	613 2	14	1008 2	4	1327 2	3
146 2	834	645 2	8	1023 2	35	1338 2	5
251 2	74	657 2	4	1132 2	6	1361 2	6
320 2	5	689 2	3	1144 2	5	1391 2	9
390 2	45	725 2	9	1172 2	16	1405 2	7
422 2	2	783 2	6	1203 2	10	1429 2	3
449 2	18	813 2	3	1221 2	9	1456 2	3
485 2	4	859 2	3	1250 2	10	1539 2	10
533 2	5	871 2	5	1278 2	5	1576 2	6
557	9	892 [#] 2	10	1290 2	4		
578	8	950 2	2	1303 2	7		

[†] Label= $d\sigma/d\Omega(\mu\text{b}/\text{sr})$.

[‡] Values at $\theta=125^\circ$.

[#] 1971St03 report $B(E3)\uparrow=0.0072$ for this level. However, if this level is the same as the $17/2^-$ member, at 896.8 keV, of the g.s. band, then it is not excited via an E3 transition.