

<sup>154</sup>Gd(d,d'), <sup>154</sup>Gd(p,p') 1967BI05

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 200,2 (2025)	22-Aug-2022

Data are from (d,d') with E(d)=12 MeV on enriched target (< 99%) with d' measured in magnetic spectrometer with FWHM ≈ 8 keV at three angles. Ratio of intensity at 90° to that at 125° ≈ 1.40 for E3 excitation, ≈ 2.1 for E2 excitation, and < 1 for multiple excitation. Other: (p,p') with E(p)=650 MeV with FWHM ≈ 65 keV to measure p'(θ) for ground state and 2+ levels at 123 and 996 keV.

Other: 1969Ch09 (d,d') on enriched target, E(d)=12 MeV; d' measured at 25 angles from 15° to 150° for ground state. 1987Gi08 (p,p') with E=650 MeV; measured p' at 23 angles 0° to 13° with FWHM ≈ 65 MeV for ground state and two 2+ levels.

<sup>154</sup>Gd Levels

E(level)	J <sup>π</sup> †	σ(μb/sr)#	Comments
0@	0+	47000	
123@	2+	4000	
371@	4+	182	
679&	0+	7	
718@	6+	8	
816&	2+	17	
998 <sup>a</sup>	2+	136	
1048&	4+	6	
1242 <sup>b</sup>	1-	8	J <sup>π</sup> : Authors show this value in parentheses.
1253 <sup>b</sup>	3-	246	
1265 <sup>a</sup>	4+	13	
1365 <sup>b</sup>	5-	11	J <sup>π</sup> : Authors show this value in parentheses.
1534	2+‡	7	
1618	3-‡	12	
1700	4+‡	13	
1794 <sup>c</sup>	3-	63	
1950	(5-) <sup>‡</sup>	5	
2101	(1,2) <sup>‡</sup>	13	
2247	(3) <sup>‡</sup>	8	

† For levels above 800 keV, deduced by authors from ratios of cross sections at 90° and 125°. Others are from the adopted values.

Differences from authors' values are noted.

‡ From the adopted values. Authors do not report a J<sup>π</sup> value for this level.

# Cross section at 90°.

@ Band(A): K<sup>π</sup>=0<sup>+</sup> ground-state band.

& Band(B): K<sup>π</sup>=0<sup>+</sup> probable β-vibrational band.

<sup>a</sup> Band(C): K<sup>π</sup>=2<sup>+</sup> γ-vibrational band.

<sup>b</sup> Band(D): K<sup>π</sup>=0<sup>-</sup> octupole-vibrational band.

<sup>c</sup> Band(E): K<sup>π</sup>=2<sup>-</sup> octupole-vibrational band.

$^{154}\text{Gd}(\text{d,d}'), ^{154}\text{Gd}(\text{p,p}') \quad \mathbf{1967\text{BI05}}$ 

		<b>Band(E): <math>K^\pi=2^-</math> octupole-vibrational band</b>	
		<u>3<sup>-</sup></u>	<u>1794</u>
		<b>Band(D): <math>K^\pi=0^-</math> octupole-vibrational band</b>	
		<u>5<sup>-</sup></u>	<u>1365</u>
		<b>Band(C): <math>K^\pi=2^+</math> <math>\gamma</math>-vibrational band</b>	
<u>4<sup>+</sup></u>	<u>1265</u>	<u>3<sup>-</sup></u>	<u>1253</u>
		<u>1<sup>-</sup></u>	<u>1242</u>
		<b>Band(B): <math>K^\pi=0^+</math> probable <math>\beta</math>-vibrational band</b>	
<u>4<sup>+</sup></u>	<u>1048</u>		
		<u>2<sup>+</sup></u>	<u>998</u>
		<b>Band(A): <math>K^\pi=0^+</math> ground-state band</b>	
<u>6<sup>+</sup></u>	<u>718</u>	<u>2<sup>+</sup></u>	<u>816</u>
		<u>0<sup>+</sup></u>	<u>679</u>
<u>4<sup>+</sup></u>	<u>371</u>		
<u>2<sup>+</sup></u>	<u>123</u>		
<u>0<sup>+</sup></u>	<u>0</u>		