^{153}Eu(^{3}He,d),^{153}Eu(α,t) 2001Bu17

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

Data are from the (^{3}He,d) and (α,t) reactions, with the reaction products measured using a magnetic spectrograph. For (^{3}He,d), E(^{3}He)=24 MeV, with the deuterons measured at θ=30° and 60 ° (FWHM≈15 keV). For (α,t), E(α)=27 MeV, with the tritons measured at 45° and 60° (FWHM≈12 keV).

^{154}Gd Levels

E(level)[†]	J$^{\pi}$[‡]	(dσ/dΩ)(μb/sr)[#]	Comments
0[a]	0$^+$	0.8 *1*	
123[a] *1*	2$^+$	31 *1*	
371[a] *1*	4$^+$	18 *1*	
718[a] *1*	6$^+$		
815[b] *1*	2$^+$		
996[c] *1*	2$^+$	6.2 *3*	
1049[&b] *2*	4$^+$	0.6 *1*	
1128[c] *2*	3$^+$	6.2 *3*	
1264[c] *2*	4$^+$	2.9 *3*	
1530 *2*	2$^+$	1.2 *3*	
≈1556	(4$^-$)	1.4 *3*	
1646[d] *2*	4$^+$	28 *2*	
1770[d] *2*	5$^+$	28 *2*	
1826 *2*		1.4 *3*	
1912[d] *2*	6$^+$	1.1 *2*	
2024[&] *2*		0.8 *3*	
2088 *2*		2.9 *3*	
2117 *2*	1$^+$,(2$^+$)	14 *1*	
2128 *2*		2 *1*	
2150 *2*	(1,2)$^+$	8.7 *5*	
2168 *2*		5 *1*	
2179[e] *2*	(1$^+$)	5 *1*	
2184[f] *2*	1$^+$	7 *1*	E(level): In (^{3}He,d) the 2179 and 2184 levels are observed as a single peak.
2224 *2*	(2$^+$)	16 *1*	E(level),J$^{\pi}$: This peak includes the 2$^+$ levels from the K^{π}=1$^+$ bands with bandheads at 2179 and 2184 keV.
2249 *2*		9 *1*	
2302 *2*	(3)$^+$	18 *1*	E(level),J$^{\pi}$: This peak includes the 3$^+$ levels from the K^{π}=1$^+$ bands with bandheads at 2179 and 2184 keV, as well as levels at 2299 (J^{π}=(1,2)), 2302 (J^{π}=(1,2)), and 2309 (J^{π}=(2)$^+$).
2342 *2*		1.4 *3*	E(level),J$^{\pi}$: This peak includes the 4$^+$ levels from the K^{π}=1$^+$ bands with bandheads at 2179 and 2184 keV.
2356 *2*		1.4 *3*	
2367[&] *2*	(2$^+$,3,4$^+$)	1.8 *3*	
2378 *2*		2.1 *3*	
2406 *2*		6.0 *5*	
2418[g] *2*	(6$^-$)	10 *1*	
2430 *2*	1,2$^+$	7 *1*	
2455 *2*	(1,2)	5 *1*	
2469 *2*		2.8 *5*	
2512 *2*		6 *1*	
2538 *2*		8 *1*	
2568[g] *2*	(7$^-$)	21 *2*	
2592 *2*		9 *1*	

Continued on next page (footnotes at end of table)

^{153}Eu(^{3}He,d),^{153}Eu(α,t) 2001Bu17 (continued)

^{154}Gd Levels (continued)

E(level)[†]	(dσ/dΩ)(μb/sr)[#]	E(level)[†]	(dσ/dΩ)(μb/sr)[#]
2620 *2*	1.0 *3*	2729 *2*	3 *1*
2645 *2*	2.6 *5*	≈2743	9 *2*
2658[@] *2*	≤1	2773[&] *2*	3 *1*
		2785[&] *2*	7 *2*

[†] Values are evaluator's average of the values from the two reactions. The uncertainties are from a general statement of the authors. Level is reported in both reactions, unless otherwise noted.
[‡] As listed by 2001Bu17.
[#] Cross section for (α,t) at 45°.
[@] Level observed only in (^{3}He,d).
[&] Level observed only in (α,t).
[a] Band(A): $K^{\pi}=0^{+}$ ground-state band.
[b] Band(B): First excited $K^{\pi}=0^{+}$ band. Probable β vibrational band. Assignment as a β band based on deduced ρ^{2}(E0) value (2001Ga02).
[c] Band(C): $K^{\pi}=2^{+}$ γ-vibrational band.
[d] Band(D): $K^{\pi}=4^{+}$ band. Dominant Configuration=(π 5/2 [413])+(π 3/2[411]). identified as a hexadecapole vibrational band by 2001Bu17.
[e] Band(E): $K^{\pi}=1^{+}$ bandhead. excited band members are unresolved in these experiments. Strongly mixed with the other $K^{\pi}=1^{+}$ band. Both bands contain a significant component of Configuration=(π 5/2[413])-(π 3/2[411]).
[f] Band(F): $K^{\pi}=1^{+}$ bandhead. see the comments for the other $K^{\pi}=1^{+}$ band.
[g] Band(G): $K^{\pi}=(5^{-})$ band. Dominant Configuration=(π 5/2[413])+(π 5/2[532]). strong Coriolis mixing is expected to bring in admixtures of other π $h_{11/2}$-related orbitals.

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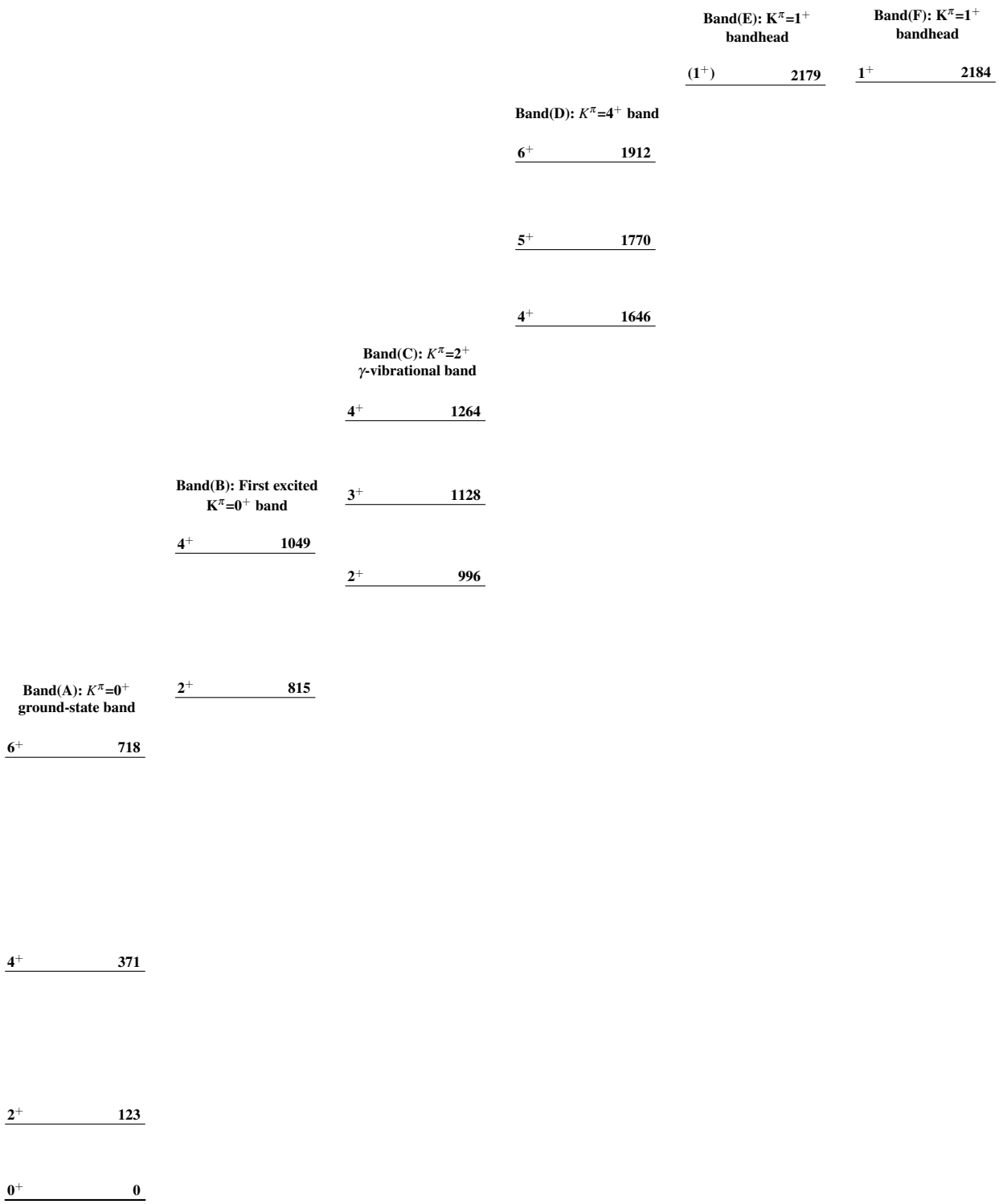

$^{154}_{64}Gd_{90}$

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Band(G): K$^{\pi}$=(5^{-}) band

(7^{-}) 2568

(6^{-}) 2418

$^{154}_{64}Gd_{90}$