^{164}Er(d,t) 1969Tj01

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	C. W. Reich, Balraj Singh	NDS 111, 1211 (2010)	12-Apr-2010

Additional information 1.
E= 12.1 MeV. Measured differential cross sections at 60°, 90° and 125°, FWHM≈ 6 keV, DWBA calculations.
1984Pe03: coupled-channel analysis of l=5 neutron transfer to $\nu 11/2^-[505]$ bandheads; deduce occupation numbers from comparison of experimental data of 1969Tj01 with theory.
1969Ka24: Coriolis-coupling analysis of (d,t) cross sections.

^{163}Er Levels

Band assignments by 1969Tj01 are based on "finger-print" method of comparison of experimental differential cross sections with those calculated from DWBA for members within a band. Note that experimental differential cross sections at 90° listed by 1969Tj01 in tables for bands differ somewhat from those in their master table for E(level) and cross section data at 60°, 90° and 125°.

E(level)[†]	Jπ[‡]	dσ/dΩ μb/sr (90°)[#]	Comments
0[c]	5/2⁻	20	
≈69[e]	5/2⁺	≈4[@]	Jπ: from Adopted Levels. 1969Tj01 tentatively propose this as 7/2⁺ member, but 7/2⁺ is inconsistent with γ-ray data.
84[c] 3	7/2⁻	8[@]	
104[d] 3	3/2⁻	101	
121[e] 3	(9/2⁺)	53	Jπ: σ(θ) consistent with 9/2⁺,ν5/2[642], although the experimental cross section is somewhat larger than predicted.
164[bd] 3	(5/2⁻)	2[@]	
190[c] 3	9/2⁻	18	
250[d] 3	7/2⁻	198	Experimental cross section is much higher than predicted, probably due to Coriolis coupling of low-lying negative parity bands. The band assignment, however, seems firm.
320[ac] 3	(11/2⁻)	≈1	
344[f] 3	1/2⁻	47	Jπ: this level may be mixed with the K-2 γ-vibrations built on the levels with the following configurations: ν3/2[521] and ν5/2[523] (1971Bu16,1969Tj01).
359[d] 3	9/2⁻	5	
405[f] 3	3/2⁻	11	
444[a] 3	(11/2⁻)	39	Jπ: comparison of coupled-channel predictions (1984Pe03) agrees with σ(θ) data (of 1969Tj01 at three angles) consistent with the ν11/2[505] assignment to this level. Predicted/experimental dσ/dΩ (90°)=82/95. The latter includes contribution from the 5/2 member of the ν1/2[521] band. Occupation number(V^2)= 0.68 *14*, emptiness number(U^2)<0.14 (1984Pe03, CCBA).
463 3	3/2⁺[&]	172	Jπ: weaker population in (d,p) than in (d,t) implies a hole state, thus supporting ν3/2[402]. Predicted/experimental dσ/dΩ (90°)=612/450.
495[d] 3	11/2⁻	7	
525 3		3	
541 3	1/2⁺[&]	207	Jπ: weaker population in (d,p) than in (d,t) implies a hole state, thus supporting ν1/2[400]. Predicted/experimental dσ/dΩ (90°)=780/602. Expected to be mixed with ν1/2[660] by a ΔN=2 interaction.
553 3		13	
573[f] 3	7/2⁻	34	
610[ag] 3	(5/2⁻)	15	

Continued on next page (footnotes at end of table)

^{164}Er(d,t) 1969Tj01 (continued)

^{163}Er Levels (continued)

E(level)[†]	Jπ[‡]	dσ/dΩ μb/sr (90°)[#]	Comments
619 *3*		5	
664 *3*		26	
683 *3*		11	
698[g] *3*	(7/2⁻)	5	
735 *3*		17	
759 *3*		18	
781 *3*		5	
842 *3*		4	
856[ah] *3*	(3/2⁻)	63	Jπ: σ(θ) indicates low L-transfer and cross section is consistent with that predicted for 3/2⁻,ν1/2[530].
877[bh] *3*	(5/2⁻)	4	
973[bh] *3*	(7/2⁻)	16	
987 *3*		10	
1075[a] *5*	(1/2⁻)	4	Probable assignment: ν1/2[510].

[†] ΔE=3 keV for E(level)< 1 MeV and 5 keV for others as in 1967Tj01.
[‡] From 1969Tj01, based on comparison of measured differential cross sections with those calculated from DWBA. See Adopted Levels levels for final assignments.
[#] 1969Tj01 also give values for θ=60° and 125°.
[@] At 60°.
[&] From systematics of odd-A Gd nuclides. Additional measurements of σ(5°) for ^{165}Er and ^{167}Er show that the L=0 level, corresponding to 1/2⁺,ν1/2[400], lies above the 3/2⁺,ν3/2[402] level.
[a] Orbital assignment is tentative due to lack of resolution or intensity.
[b] Orbital assignment is tentative because experimental cross section is considerably different from that predicted by DWBA.
[c] Band(A): ν5/2[523] band. Predicted/experimental dσ/dΩ (90°) for 5/2, 7/2, 9/2, and 11/2 members, respectively are: 39/31, 41/≈20, 65/34, and 5/≈2. Relative predicted/experimental ($C^2_{j,l}$) coefficients respectively are: 0.07/0.11, 0.08/0.07, 0.79/0.78, 0.06/0.05. A=11.9.
[d] Band(B): ν3/2[521] band. Predicted/experimental dσ/dΩ (90°) for 3/2, 5/2, 7/2, 9/2, and 11/2 members, respectively are: 157/180, 0/≈2, 281/395, 21/12 and 9/16. Relative predicted/experimental ($C^2_{j,l}$) coefficients respectively are: 0.10/0.10, 0/0.003, 0.53/0.61, 0.25/0.12, 0.11/0.16. A=12.1.
[e] Band(C): ν5/2[642] band.
[f] Band(D): ν1/2[521] band. A=13.2, a=0.41.
[g] Band(E): ν5/2[512] band. A=12.6.
[h] Band(F): ν1/2[530] band. A=8.9, a=0.53.

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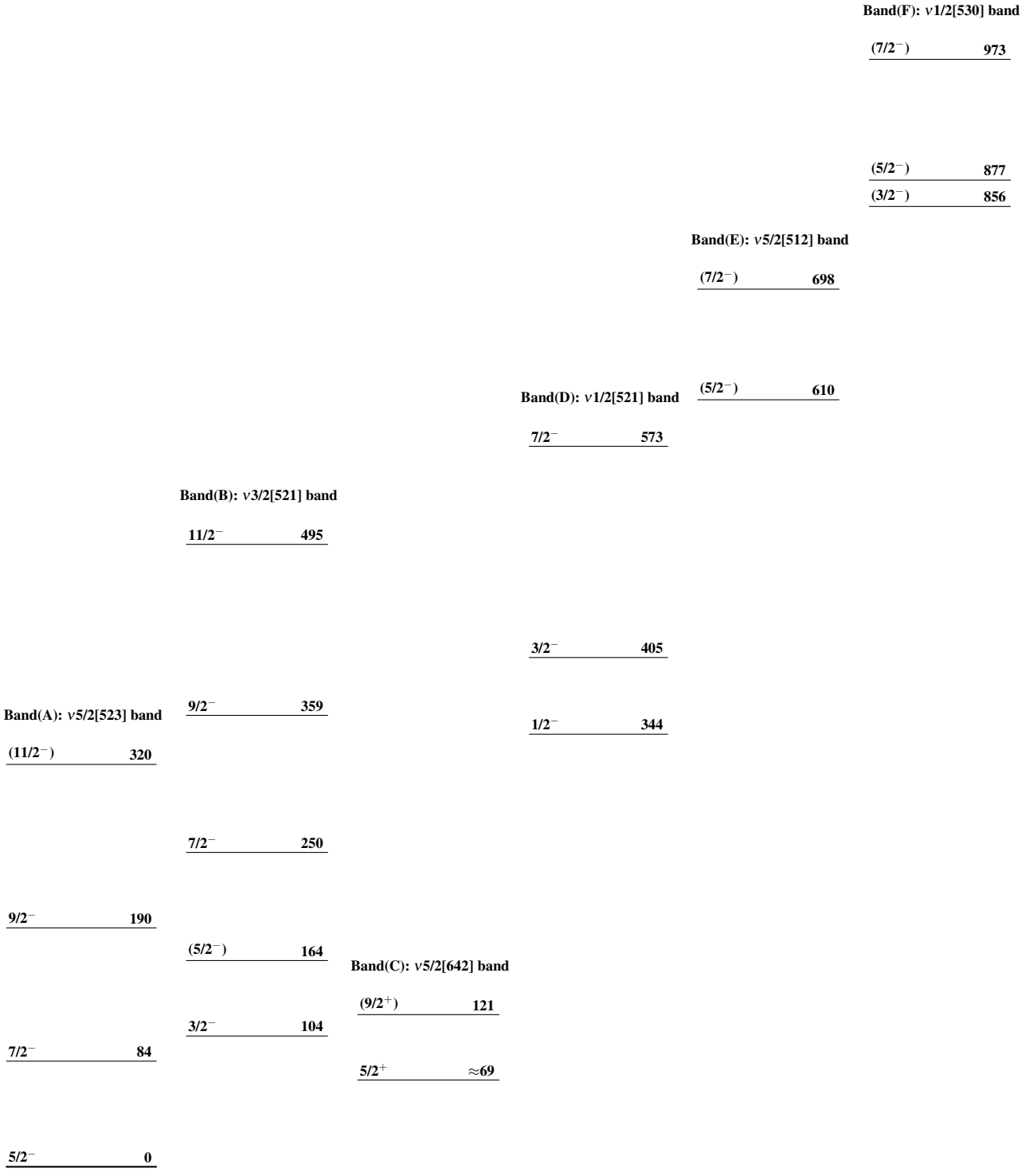

$^{163}_{68}Er_{95}$