^{162}Dy(d,t),^{162}Dy(^{3}He,α) 1986Sc16,1976Pe02,1970Gr46

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	C. W. Reich	NDS 112,2497 (2011)	1-Jun-2011

Additional information 1.

Data for levels below 1400 keV are from 1986Sc16 and above 1440 keV from 1970Gr46, both from ^{162}Dy(d,t), unless otherwise noted. These studies used E(d)=12 to 22 MeV and had FWHM=3 to ≈9 keV. Other (d,t) studies: 1973Ma43, 1975Ho21, 1976Pe02, 1977Be03, and 1980St31 with E(d)=12 to 17 MeV. An ^{162}Dy(^{3}He,α) study, by 1975Gr37 with E(^{3}He)=25.5 MeV and FWHM=45 keV, provides very little information.

1970Gr46: ^{162}Dy(d,t) reaction with E(d)=12.1 MeV. ^{3}H measured in magnetic spectrograph at 60°, 90°, and 125°. FWHM not given, but expected to be ≈9 keV and uncertainty in level energy expected to be 3-5 keV. ^{160}Dy(d,p) reaction also studied.

1975Ho21: ^{162}Dy(d,t) reaction on enriched (≈90% ^{162}Dy) metallic target, E(d)=12.1 MeV. ^{3}H measured in magnetic spectrograph at angles from 10° to 150°. FWHM ranged from 12 to 20 keV, depending on the angle. Used results from 1970Gr46 for well-known states to assist in assigning L values to other states. DWBA analysis.

1976Pe02: ^{162}Dy(d,t) reaction on enriched (96.3%) target with E(d)=17 Mev. ^{3}H measured in magnetic spectrometer at fifteen angles from 8° to 50° with FWHM≈10 keV. L values are given. Band assignments are mostly from 1970Gr46.

1986Sc16: ^{160}Dy(d,t): E(d)=14 MeV at θ=30° and 22 MeV at θ=35°. Isotope-separated targets. Q3D spectrograph. Data recorded using two multiwire proportional counters, operated in coincidence with a scintillation counter. FWHM=3-5 keV.

^{161}Dy Levels

Additional information 2.

E(level)[†]	J$^{\pi}$[‡]	L[#]	Relative I$_t$ At θ=35°[@]	Comments
0[f]	5/2$^+$	(2)	3.6 *11*	L: from 1975Ho21.
25.69[g] *24*	5/2$^-$	3	80 *4*	
43.1[f] *4*	7/2$^+$		13 *2*	
74.56[h] *14*	3/2$^-$	1	588 *12*	
100.7[f] *3*	9/2$^+$	4	258 *8*	L: 1977Be03 have L=3, which applies to the 7/2$^-$ level at 103.
132.10[h] *21*	5/2$^-$	(3)	30 *3*	L: from 1977Be03. L=(2) of 1976Pe02 is not consistent with π.
183.3[f] *7*	11/2$^+$		5.7 *10*	
201.06[g] *15*	9/2$^-$		108 *4*	
213.08[h] *13*	7/2$^-$	3	1000	
267.74[f] *17*	13/2$^+$	6	316 *13*	
313.9[h] *5*	9/2$^-$		14 *3*	
319.9[g] *3*	11/2$^-$	(5)	25 *9*	L: from 1977Be03.
367.08[i] *12*	1/2$^-$	1	3.5×10^2 *3*	
418.16[i] *17*	3/2$^-$	1	50 *9*	
443.40[h] *18*	11/2$^-$	(5)	123 *7*	L: from 1975Ho21.
451.56[i] *15*	5/2$^-$	(3)	60 *5*	
485.56[j] *16*	11/2$^-$	(5)	301 *16*	L: from 1977Be03; also L=5 from 1975Ho21.
512[a]				
521[b]				
550[k] *1*	3/2$^+$	2	1.65×10^3 *20*	E(level): energy given as 550 *13* in 1986Sc16, but evaluator assumes that this is a misprint and that the uncertainty should actually be 1.3 keV. The value in 1970Gr46 is 551.
568.4[i] *3*	7/2$^-$	(3)	113 *7*	L: also L=3 from 1975Ho21.

Continued on next page (footnotes at end of table)

^{162}Dy(d,t),^{162}Dy(^{3}He,α) 1986Sc16,1976Pe02,1970Gr46 (continued)

^{161}Dy Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	L[#]	Relative I$_t$ At θ=35°[@]	Comments
607.61[l] *18*	1/2$^+$	0	1.16×10^3 *4*	E(level): doublet with the 609 level (1986Sc16).
609[k]	5/2$^+$			E(level): doublet with the 607.6 level (1986Sc16).
626.4[i] *3*	9/2$^-$	(5)	23 *7*	L: from 1975Ho21.
632.6[l] *3*	5/2$^+$	(2)	47 *8*	
642[c]				
678.65[m]	3/2$^+$	2	385 *18*	J$^{\pi}$: others: Assigned (9/2$^+$) by 1975Ho21 and (7/2$^-$) by 1977Be03. L: others: L=4 from 1975Ho21 and (4) from 1977Be03.
688.3 *3*		2,3	40 *5*	L: from 1986Sc16.
701.1[n] *5*	3/2$^+$		12 *3*	
717.05 *22*		4	120 *7*	J$^{\pi}$: assignment of 1977Be03 is 3/2$^-$,3/2[532], based on L=(1). L: others: L=2,3 from 1975Ho21 and (1) from 1977Be03.
731.24[m] *18*	5/2$^+$		97 *6*	
773.34[n] *14*	1/2$^+$	0	1.11×10^3 *4*	
790.2[p] *5*	5/2$^-$		29 *4*	
803.93[o] *22*	3/2$^-$	(1)	40 *11*	J$^{\pi}$: assigned as 11/2$^-$,1/2[521] by 1970Gr46.
825.91[l] *16*	3/2$^+$	2	98 *6*	J$^{\pi}$: *J*$^{\pi}$=5/2$^-$,7/2$^-$ from 1977Be03, but conf=1/2$^-$,1/2[530], from 1975Ho21.
849.44[n] *19*	5/2$^+$	2	416 *30*	E(level): doublet level (1986Sc16). J$^{\pi}$: assigned as 5/2$^-$,3/2[532] by 1975Ho21. L: others: L=3 from 1975Ho21 and 1 from 1977Be03.
857[m]	(7/2)$^+$			E(level): doublet with 858.39 level (1986Sc16).
858.39[q] *20*	3/2$^-$	1	7.0×10^2 *5*	
872.5[q] *3*	1/2$^-$		41 *6*	J$^{\pi}$: assigned as 5/2$^-$,1/2[530] by 1977Be03. L: L=(3) given by 1977Be03.
878.51[p] *15*	7/2$^-$	3	66 *7*	J$^{\pi}$: assignment of 1977Be03 is 5/2$^-$,5/2[512] and that of 1970Gr46 is 5/2$^-$,1/2[530]. L: from 1975Ho21.
898.87 *22*	9/2$^+$		12.9 *12*	
923.01 *20*	5/2$^-$,7/2$^-$	3	44 *2*	
941.6 *4*			6 *3*	
957.0[q] *3*	7/2$^-$	3	101 *5*	E(level): level and assignment are shown as tentative by 1986Sc16. L: from 1975Ho21.
970.2[q] *3*	5/2$^-$		54 *3*	
972.8 *9*				J$^{\pi}$: assignment of 1977Be03 is 9/2$^-$,3/2[532].
988.0[ap] *10*	9/2$^-$		8.3 *17*	L: L=(5) from 1975Ho21 for a peak at 999 keV.
1005.29 *24*	1/2$^+$,3/2$^+$		30 *6*	J$^{\pi}$: assignment of 1977Be03 is 5/2$^-$.
1024.8 *3*		2	110 *24*	J$^{\pi}$: assignment of 1977Be03 is 5/2$^-$, 7/2$^-$ and of 1975Ho21 is 9/2$^-$,3/2[532]. L: other: L=3 from 1977Be03.
1043[&] *4*				
1062.1 *6*			10.1 *16*	
1098.3 *6*	3/2$^+$		10.0 *21*	
1111.2 *4*			12.2 *15*	
1125.4 *3*		(5)	71 *5*	J$^{\pi}$: assignment of 1975Ho21 is 11/2$^-$,3/2[532] and 11/2$^-$,1/2[530]. L: from 1975Ho21.
1136.1 *4*		3	71 *5*	J$^{\pi}$: assignment of 1977Be03 is 7/2$^+$,9/2$^+$. L: other: L=4 from 1977Be03.

Continued on next page (footnotes at end of table)

^{162}Dy(d,t),^{162}Dy(^{3}He,α) 1986Sc16,1976Pe02,1970Gr46 (continued)

^{161}Dy Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	L[#]	Relative I$_t$ At θ=35°[@]	Comments
1146.8 *7*		3	13 *4*	L: from 1976Pe02.
1154.2 *11*	1/2$^{(-)}$,3/2$^{(-)}$	1	43 *3*	
1163.0 *5*			21.3 *19*	
1178.6 *3*	5/2,7/2$^-$		57 *4*	L: L=0 from 1976Pe02 conflicts with J^{π} assignment.
1204.6 *6*		3	88 *6*	J$^{\pi}$: assignment of 1977Be03 is 5/2$^+$. 1980St31 assigns 11/2$^-$.
1271.9 *6*		3	33 *5*	J$^{\pi}$: 1977Be03 assign this as 1/2$^-$,1/2[510]. L: other: L=(1), from 1977Be03, which would appear to agree with the J^{π}=1/2$^-$ assignment for the 1268.9 level. However, interpreted as the bandhead of 1/2[510], the 1268.9 level is not expected to be observed in this single-nucleon transfer reaction.
1287.5 *6*			21 *3*	
1302.9 *3*	3/2$^-$		13.4 *20*	E(level): assigned as the 3/2$^-$ member of the 1/2[510] band. The other band members are not observed in (d,t) because their smaller relative cross sections imply that they will not be appreciably populated in this reaction (1/2[510] is a high-lying particle state in ^{161}Dy).
1313[d]				
1359.7 *4*	1/2$^-$,3/2$^-$		21 *3*	E(level): reported by 1975Ho21 and 1976Pe02 in (d,t) and by 1975Gr37 in (^{3}He,α).
1378.8 *5*	3/2$^-$	1	115 *10*	J$^{\pi}$: assignment of 1977Be03 is 3/2$^+$. L: other: L=2 from 1977Be03.
1402[d]	5/2,7/2$^+$			
1416[r]	7/2$^+$	4		E(level): from 1970Gr46. L: from 1975Ho21 and 1977Be03. Other: L=(2) from 1976Pe02.
1436[e]		1		
1460				
1493[d]				
1601[b]		0		
1650[b]				
1743[b]		0		
1765[b]				
1780[b]		0		
1818[b]		0		
1859[b]				
1871[b]				
1892[b]		3		
1920[b]				
2215[b]		3		
2230[b]				

[†] Values are from 1986Sc16, unless otherwise noted. Values are authors′ average from (d,t) and (d,p) reactions.
[‡] From adopted values.
[#] From 1976Pe02, unless otherwise noted; conflicting values are noted.
[@] Values are those of 1986Sc16 for E(d)=22 MeV.
[&] Reported only by 1977Be03 in (d,t).

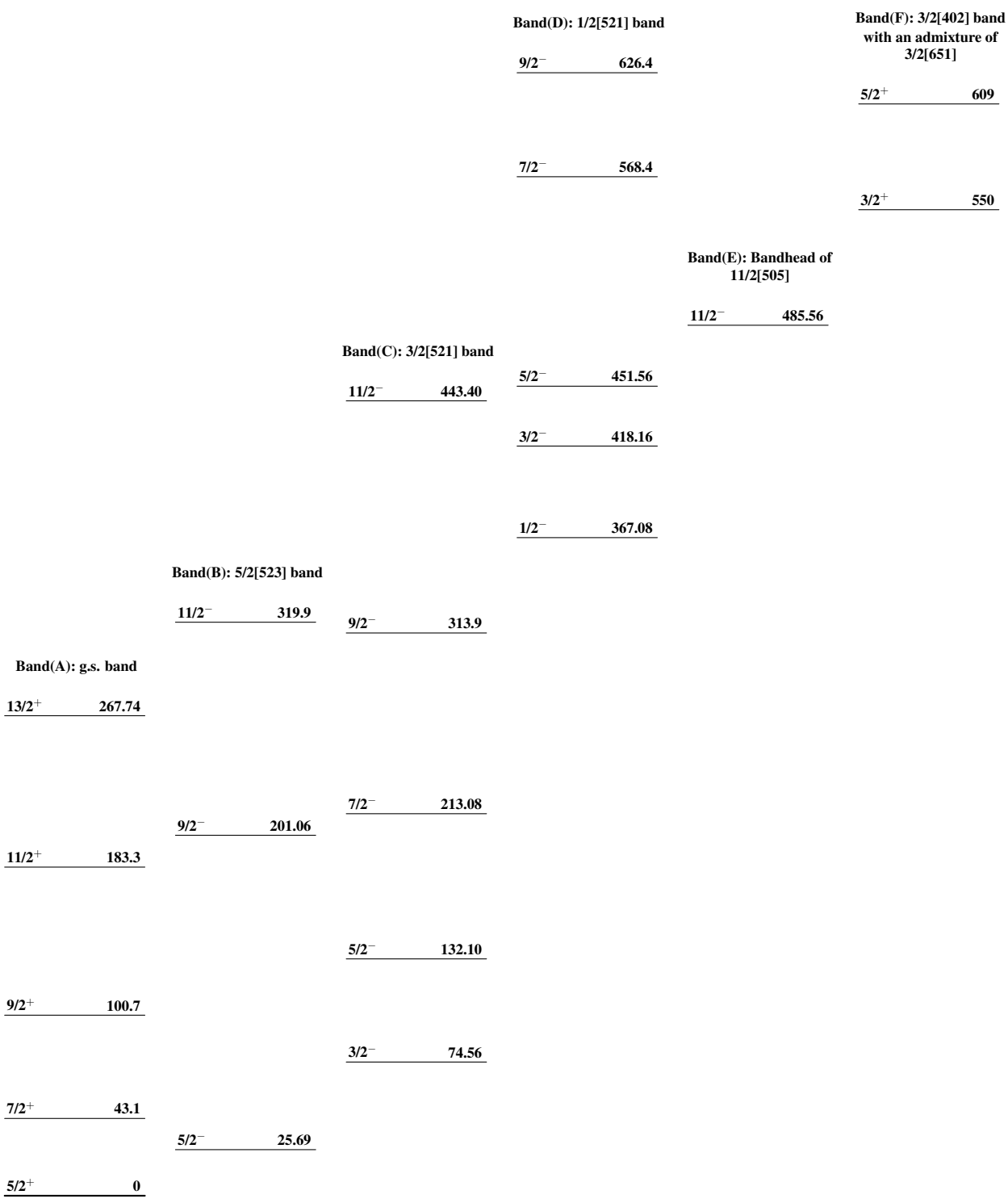
Continued on next page (footnotes at end of table)

^{162}Dy(d,t),^{162}Dy(^{3}He,α) 1986Sc16,1976Pe02,1970Gr46 (continued)

^{161}Dy Levels (continued)

[a] Reported by 1976Pe02 and 1975Ho21 in (d,t).
[b] Reported only by 1976Pe02 in (d,t).
[c] Reported only by 1975Ho21 in (d,t).
[d] Reported only by 1975Gr37 in (^{3}He,α).
[e] Reported only by 1976Pe02 and 1977Be03 in (d,t).
[f] Band(A): g.s. band. configuration=5/2[642].
[g] Band(B): 5/2[523] band.
[h] Band(C): 3/2[521] band.
[i] Band(D): 1/2[521] band.
[j] Band(E): Bandhead of 11/2[505].
[k] Band(F): 3/2[402] band with an admixture of 3/2[651].
[l] Band(G): 1/2[660] band with an admixture of 1/2[400].
[m] Band(H): 3/2[651] band with an admixture of 3/2[402].
[n] Band(I): 1/2[400] band with an admixture of 1/2[660].
[o] Band(J): K-2 γ-vibrational band based on 3/2[521].
[p] Band(K): 5/2[512] band.
[q] Band(L): 1/2[530] band.
[r] Band(M): bandhead of 7/2[404].

^{162}Dy(d,t),^{162}Dy(^{3}He,α) 1986Sc16,1976Pe02,1970Gr46



$^{161}_{66}Dy_{95}$

^{162}Dy(d,t),^{162}Dy(^{3}He,α) 1986Sc16,1976Pe02,1970Gr46 (continued)

Band(K): 5/2[512] band

9/2$^-$ 988.0

Band(L): 1/2[530] band

5/2$^-$ 970.2

7/2$^-$ 957.0

Band(H): 3/2[651] band with an admixture of 3/2[402]

(7/2)$^+$ 857

Band(I): 1/2[400] band with an admixture of 1/2[660]

5/2$^+$ 849.44

7/2$^-$ 878.51

1/2$^-$ 872.5

3/2$^-$ 858.39

Band(G): 1/2[660] band with an admixture of 1/2[400]

3/2$^+$ 825.91

Band(J): K-2 γ-vibrational band based on 3/2[521]

3/2$^-$ 803.93

5/2$^-$ 790.2

1/2$^+$ 773.34

5/2$^+$ 731.24

3/2$^+$ 701.1

3/2$^+$ 678.65

5/2$^+$ 632.6

1/2$^+$ 607.61

$^{161}_{66}Dy_{95}$

^{162}Dy(d,t),^{162}Dy(^{3}He,α) 1986Sc16,1976Pe02,1970Gr46 (continued)

Band(M): Bandhead of 7/2[404]

$7/2^+$	1416

$^{161}_{66}Dy_{95}$