^{162}Dy(d,p) 1989Sc31,1974Ho24,1970Gr46

History

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

Additional information 1.

1989Sc31: E= 14 MeV. Measured proton spectra at θ(lab)=45°, magnetic spectrometer, multiwire detector and scintillation counter in coincidence mode. FWHM=3 to 5 keV.

1974Ho24 (also 1980St31,1980St29): E= 12.1 MeV. Measured $\sigma(\theta)$ for 12-17 angles from 10° to 150°. FWHM= 18 keV. Deduced L-transfers and C^2S values from comparisons with DWBA analysis. Data reanalyzed by 1980St31 and 1980St29 using DWBA including pairing, multipole-multipole, Coriolis, and ΔN=2 interactions. Levels reported up to 2417.

1970Gr46: E= 12.1 MeV. Measured $\sigma(\theta)$ at 60°, 90°, and 125°. Deduced J^π and Nilsson assignments based on intensity patterns for rotational states ("fingerprint method") obtained from cross sections at three angles. Levels reported up to 2351.

Others:

1967Sc05: E= 12 MeV. Measured σ(45°,60°). FWHM≈ 17 keV (evaluators′ estimate). Levels reported up to 1490.

1974Ba26: E= 9 MeV. Measured $\sigma(\theta)$.

1978HaZF: E= 9 MeV. Measured σ(55°−155°, 6 θ′s); semiconductor telescope. FWHM= 60 keV.

1984Pe03: analysis of data at E= 12 MeV.

1989Sc31 report several levels previously either unseen or unresolved (especially above 700 keV) bringing the energy levels into much better agreement with those seen in other reactions.

Tentative multiplets at ≈1370 and ≈1469 from 1967Sc05 have been omitted since these are not confirmed in other studies.

See band assignments under Adopted Levels.

Energy (1989Sc31)	Relative Intensity (1989Sc31)	dσ/dΩ (90°) μb/sr (1974Ho24)
0.0	100	12
73.6	173 *12*	14
167.3	124 *5*	15
251.1	16.8 *16*	
281.5	22 *3*	3
284.9	10 *2*	
336.5	210 *13*	
351.2	1490 *50*	109
389.8	117 *9*	5
413.3	25 *3*	
421.9	550 *21*	
427.7	179 *25*	54
475.5	82 *4*	4
497.2	170 *12*	21
514.6	1350 *50*	90
553.1	292 *15*	28
566.0	9 *2*	
587.5	255 *25*	9
646.3	73 *4*	5
660.0	11.0 *13*	8
705	14.4 *19*	
711.8	36 *3*	
718.2	66 *4*	10
737.4	144 *7*	10
766.3	24 *3*	4
781.5	40 *4*	
793.8	1630 *80*	
801.7	2890 *130*	254
821.0	193 *16*	
826.8	77 *8*	20
851.5	36 *4*	
859.6	285 *15*	21
884.0	392 *20*	32
915.2	121 *8*	9

935.5	72 *9*		
946.3	845 *60*	68	
953.5	32 *9*		
966.4	13 *6*		
991.2	12.4 *23*		
1009.5	10.8 *22*		
1022.4	18 *4*		
1030.5	10.5 *20*		
1049.4	325 *19*		
1058.4	312 *18*	36	
1073.2	6.8 *34*		
1080.6	35 *7*		
1086.5	61 *6*	5	
1093.1	14 *4*		
1122.2	121 *9*	24	
1131.0	57 *6*		
1134.9	41 *5*		
1147.6	17.4 *24*		
1157.7	42 *4*		
1160.4	150 *14*	9	
1183.7	9 *4*		
1195.8	4200 *300*	184	
1229.6	12 *6*		
1258.0	1080 *90*	62	
1281		7	

Energy (1989Sc31)	Relative Intensity (1989Sc31)	dσ/dΩ (90°) μb/sr (1974Ho24)
1341		36
1436		15
1493		7
1519		15
1542		74
1590		8
1623		21
1650		9
1691		22
1708		15
1729		32
1794		172
1814		39
1853		221
1870		75
1887		18
1935		95
1958		74
1983		122
2009		32
2056		37
2087		9
2111		36
2163		34
2196		23
2225		26
2259		20
2288		14
2311		91
2344		46
2388		24
2417		28

E(level): from 1974Ho24 above 1260

E(level)[†]	J^{π}[‡]	L[#]	S[#]	Comments
0.0	$5/2^-$	(3)	0.018	E(level): 0.1 *2* (1989Sc31).
73.6 *2*	$7/2^-$	(3)	0.015	
167.3 *2*	$9/2^-$	5	0.112	
251.1[d] *2*				
281.5 *4*	$11/2^-$	(5)	0.128	
284.9[d] *5*				
336.5[d] *2*				
351.2 *2*	$(1/2)^-$	1	0.175	
389.8 *3*	$3/2^-$	1	0.004	
413.3[d] *3*				E(level): doublet.
421.9 *2*	$(3/2)^-$	1		
427.7 *3*	$(5/2)^-$			
475.5 *2*	$(5/2)^-$			
497.2 *3*	$13/2^+$	6	0.120	
514.6 *2*	$7/2^-$	(3)	≤0.073	
553.1 *2*	$7/2^-$	3	0.023	
566.0[d] *4*				
587.5 *3*				
646.3 *2*	$9/2^-$			
660.0 *5*				E(level): 651 (1970Gr46).
705[d] *8*				
711.8[d] *4*				
718.2 *2*	$(13/2^+)$	(6)	0.049	J^{π}: from L=(6). $J^{\pi}=(11/2^-)$ in Adopted Levels.
737.4 *2*	$1/2^+$	0	0.008	
766.3 *2*	$(3/2)^+$			E(level): possibly a doublet which is predominantly the $3/2^+$ member of the K-2 γ-vibrational band built on 5/2[642], but may also contain a $11/2^-$, 3/2[521] component (1989Sc31).
781.5[d] *3*				
793.8[d] *3*				
801.7 *3*	$(7/2)^-$	3	0.228	
821.0[@] *2*				
826.8[@] *3*				
851.5[d] *2*	$11/2^-$			J^{π}: Assigned as the bandhead of 11/2[505].
859.6 *2*	$(3/2^+)$	(2)		
884.0 *2*				E(level): doublet (1989Sc31).
915.2 *3*	$(9/2)^-$	5	0.063	E(level): 918 (1967Sc05), 918 (1970Gr46), 915 (1974Ho24). On the basis of a model-dependent assignment, 1989Sc31 suggest that a 915.2 group is populated in (d,p) and a 916.1 in (d,t).
935.5[d] *2*				
946.3 *2*	$(7/2)^-$	3	0.082,0.047	
953.5[d] *3*				
966.4[d] *3*				
991.2[d] *3*				
1009.5[d] *5*				
1022.4[&] *3*				
1030.5[&] *4*				
1049.4[d] *2*				
1058.4 *2*	$1/2^+$	(0)	0.033	
1073.2[d] *6*				
1080.6[a] *4*				
1086.5[a] *4*				
1093.1[a] *3*				

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^{162}Dy(d,p) 1989Sc31,1974Ho24,1970Gr46 (continued)

^{163}Dy Levels (continued)

E(level)†	Jπ‡	L#	S#	Comments
1122.2[b] 3				
1131.0[b] 3				
1134.9[b] 3				
1147.6[c] 4				
1157.7[c] 3				
1160.4[c] 3	(1/2)$^-$			
1183.7[d] 5				
1195.8 3	(3/2)$^-$	(1)	0.104	
1229.6[d] 1				
1258.0 5	5/2$^-$	(3)	0.076	Additional information 2.
1284 5				
1342 5		(3)	0.024	S: for 7/2$^-$.
1448 5				E(level): 1436 (1974Ho24), 1441 (1967Sc05).
1494 5	(1/2$^+$)	(0)	0.004	
1533 5	1/2$^+$	0	0.008	E(level): 1519 (1974Ho24).
1549 5				
1597 5				
1629 5				
1663 5				E(level): 1650 (1974Ho24).
1696 5				
1713 5				
1734 5	3/2$^+$,5/2$^+$	2	0.019,0.011	
1795 5		0,1	0.087	S: for J^π=3/2$^-$.
1817 5				
1856 5		2	0.077	S: for 5/2$^+$.
1870[e]				
1887[e]				
1936 5				
1957 5				
1988 5				
2012 5				
2067 5	5/2$^-$,7/2$^-$	3	0.032,0.018	
2087 5				
2114 5				
2169 5				
2196[e]				
2225[e]				
2259[e]				
2288[e]				
2317 5				
2351 5				
2388[e]				
2417[e]				
≈3400[f]		(2)		L: from 1978HaZF.
≈3700?[f]				

† From 1989Sc31 below 1260 (average of (d,p) and (d,t) when a level is populated in both reactions), and from 1970Gr46 above 1260, except as noted. Above 1260, uncertainty of 5 keV is assigned for levels from 1970Gr46 based on a statement about uncertainty in a related paper by 1967Tj01. No uncertainties are available for energies given by 1974Ho24.

‡ From Adopted Levels, except as noted.

Continued on next page (footnotes at end of table)

^{162}Dy(d,p) 1989Sc31,1974Ho24,1970Gr46 (continued)

^{163}Dy Levels (continued)

From 1974Ho24, except as noted. For spectroscopic factors, normalization factor=1.65 was used in DWBA calculations. For the measured relative intensities and cross sections for the individual proton groups, see the table (above) in this data set.
@ 820 (1967Sc05), 827 (1970Gr46), 824 (1974Ho24).
& 1025 (1967Sc05).
a 1089 (1967Sc05), 1087 (1970Gr46), 1086 (1974Ho24).
b 1129 (1967Sc05), 1126 (1970Gr46), 1123 (1974Ho24).
c 1153 (1967Sc05), 1159 (1970Gr46), 1156 (1974Ho24).
d From 1989Sc31 only.
e From 1974Ho24 only.
f From 1978HaZF only.