^{162}Dy(^{3}He,d)   1977Pa23,1974Le27

History

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

Additional information 1.

1977Pa23 (also 1975Bu02 for Q value): E= 24 MeV, FWHM≈14. Measured $\sigma(\theta)$ at 8 to 9 angles. Uncertainty for relative σ's is 15% for strong and well resolved peaks and ≈25% for absolute cross sections. Comparisons with DWBA calculations.

1974Le27 (also 1976Br37,1974BrXQ): E= 46.5 MeV; measured $\sigma(\theta)$ from 0° to 35° in 2.5° steps. FWHM=15. Additional analysis, including CCBA, carried out by 1976Br37.

1982An19: measured Q value.

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Cross section data at 45°  (1977Pa23)
   Level        dσ/dΩ  (µb/sr)
    222           31
    299           26
    308           40
    360           24
    393           95
    441           32
    471           36
    501           48
    529            5.1
    578           34
    612            9.9
    710          128
    743           13
    872            5.2
    990            3.6
   1114           22
   1229            5.5
   1328           49
   1371            6.0
   1435           21
   1518            3.9
   1551           10
   1636           18
   1664           21
   1685           10
   1709            5.9
   1743           15
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^{163}Ho Levels

Nuclear structure factor S=[dσ/dΩ(exp)]/2N [dσ/dΩ(DWBA)], where N=4.42. S=[Σ_i(C$_{jl}$)$_i$a$_i$U$_i$]^2; C=expansion coefficients which describe Nilsson orbitals in terms of spherical states, a=Coriolis mixing amplitudes, U=emptiness factors.

E(level)[†]	J$^{\pi}$[‡]	L[#]	Nuclear structure factor	Comments
0[a]	(7/2$^-$)	(3)	(0.02)[&]	L: from figure 6 of 1976Br37 giving $\sigma(\theta)$.
100[a]	(9/2$^-$)	(5)	(0.08)[&]	E(level): from 1974Le27. L: from figure 6 of 1976Br37 giving $\sigma(\theta)$.
222.2[a]	(11/2)$^-$	5	1.60	E(level): from (d,2nγ) (1972Fu09), used for normalization of other energies. Additional information 2.

^{162}**Dy(^{3}He,d)**   **1977Pa23,1974Le27 (continued)**

^{163}Ho Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	L[#]	Nuclear structure factor	Comments
299[b] 5	1/2$^+$	0	0.10	L: from $\sigma(^3$He,d)/$\sigma(\alpha$,t) (1977Pa23).
308[b] 5	(3/2)$^+$	2	0.39	Additional information 3.
360[c] 5	(3/2)$^+$	2	0.19	Additional information 4.
393[b] 2	(5/2)$^+$	2	0.77	Additional information 5.
419?[@]				
441[d] 5	(7/2$^+$&5/2$^+$)	4+2	0.7+0.07	E(level): triplet of levels: dominant component is expected to be the π7/2[404] bandhead. Other components are: 7/2,1/2[411] and 5/2,3/2[411].
471[e] 5	(1/2)$^-$	1	0.13	Additional information 6.
501[e] 2	(5/2$^-$)	3	0.48	Additional information 7.
529[c] 5	7/2$^+$	4	0.26	L: from $\sigma(\theta)$ (1974Le27). L=2,3 (1977Pa23), $\leq$2 (1974Le27) from $\sigma(^3$He,d)/$\sigma(\alpha$,t).
552?[@d]			(0.07)[&]	
578[e] 5	(3/2)$^-$	1	0.15	Additional information 8.
588?[@b]	(9/2$^+$)			
594?[@]				
612[e] 2	(9/2)$^-$	5	0.87	Additional information 9.
710 2	(5/2)$^+$	2	0.96	5/2[402]. Additional information 10.
743[e] 5	(7/2)$^-$	3	0.11	L: 3,4 (1977Pa23), $\leq$2 (1974Le27) from $\sigma(^3$He,d)/$\sigma(\alpha$,t).
872 5	(5/2$^+$)	(2)		5/2[413]. L: 2,3 from $\sigma(^3$He,d)/$\sigma(\alpha$,t) (1977Pa23).
990 5		(4)		E(level): 998 (1974Le27). L: from $\sigma(^3$He,d)/$\sigma(\alpha$,t) (1977Pa23).
1114 2	(3/2)$^+$	2	0.15	E(level)=1128, L=2 (1974Le27). Additional information 11. Possible K-2 γ vibration built on π7/2[404].
1229 5		(2,3)		L: from $\sigma(^3$He,d)/$\sigma(\alpha$,t) (1977Pa23).
1328 2	1/2$^+$	0	0.18	E(level): 1350 (1974Le27). Additional information 12. Possible K-2 γ vibration built on π5/2[402].
1371 5			0.29[&]	E(level): strong 1371 (L=3) reported in 1974Le27 is probably a different group from 1371 in 1977Pa23 due to an energy discrepancy of $\approx$ 25 keV (higher value in 1974Le27) between the two studies near this excitation energy (see comments for 1328 and 1435 levels).
1435[f] 5	(11/2)$^-$	5	0.84	E(level): 1465 (1974Le27). Additional information 13. L: from $\sigma(\theta)$ (1974Le27) and $\sigma(^3$He,d)/$\sigma(\alpha$,t) (1977Pa23).
1518 5				
1551 5				
1636 5				
1664 5				
1685 5				
1709 5				
1743 5				

[†] From 1977Pa23, unless otherwise stated. The values are normalized to 222.2 level known from (d,2nγ) (1972Fu09). An uncertainty of 2 keV is given (1977Pa23) for strong and well-resolved peaks. Uncertainty of 5 keV is assigned (evaluators) for

Continued on next page (footnotes at end of table)

^{162}Dy(^{3}He,d)   **1977Pa23,1974Le27 (continued)**

^{163}Ho Levels (continued)

other peaks.

‡ From L-transfers from $\sigma(\theta)$ and DWBA, membership in indicated band, and systematics of odd-A Ho isotopes.

From DWBA comparison to $\sigma(^3$He,d) (1977Pa23), except as noted.

@ From 1974Le27 only.

& From 1974Le27.

^{a} Band(A): $\pi7/2$[523] band.

^{b} Band(B): $\pi1/2$[411] band. (1977Pa23,1974Le27). Strong mixing between $\pi1/2$[411] and $\pi3/2$[411] orbitals. The anomalously high (^{3}He,d) σ's for the 3/2,3/2[411] and 5/2$^+$,1/2[411] levels cannot be completely accounted for by Coriolis mixing between the orbitals (1977Pa23). CCBA also do not reproduce the data for 5/2$^+$,1/2[411] (1976Br37).

^{c} Band(C): $\pi3/2$[411] band. (1977Pa23). Strong mixing between $\pi1/2$[411] and $\pi3/2$[411] orbitals. See discussion under the $\pi1/2$[411] band.

^{d} Band(D): $\pi7/2$[404] band. (1977Pa23,1974Le27).

^{e} Band(E): $\pi1/2$[541] band. σ's underestimated in both DWBA and CCBA calculations (1976Br37).

^{f} Band(F): $\pi9/2$[514] band (?).

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Band(E): π1/2[541] band

(7/2)⁻   743

Band(B): π1/2[411] band   (9/2)⁻   612

(9/2⁺) _ _ _ _ _ _ _ 588   **Band(D): π7/2[404] band**   (3/2)⁻   578

                              Band(C): π3/2[411] band   _ _ _ _ _ _ _ _ 552

                              7/2⁺   529

                                                                              (5/2⁻)   501

                                                                              (1/2)⁻   471

(7/2⁺&5/2⁺)   441   (7/2⁺&5/2⁺)   441   (7/2⁺&5/2⁺)   441

(5/2)⁺   393

                              (3/2)⁺   360

(3/2)⁺   308
1/2⁺   299

Band(A): π7/2[523] band

(11/2)⁻   222.2

(9/2⁻)   100

(7/2⁻)   0

$^{163}_{67}$Ho$_{96}$

^{162}Dy(^{3}He,d)   1977Pa23,1974Le27 (continued)

Band(F): π9/2[514] band
(?)

(11/2)⁻   1435

$^{163}_{67}$Ho$_{96}$