

¹⁵⁸Dy(³He,d) 1977Pa23

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	C. W. Reich	NDS 113, 157 (2012)	31-Dec-2010

Additional information 1.

(³He,d) with E(³He)=24 MeV in magnetic spectrograph with FWHM≈14 keV at 45° and 70°. Also (α,t) results given in the same paper.

¹⁵⁹Ho Levels

E(level) [†]	J ^π [‡]	L [#]	S@&	Comments
0 ^d	7/2 ⁻		3	L: Cross-section ratio (fig. 10 of 1977Pa23) suggests L=1,2, but L=(3) from (p,α) (1982Ha17).
98 ^d	9/2 ⁻	5	1	
166 ^e	7/2 ⁺	4	23	
212 ^f	3/2 ⁺	(2) ^b	103	J ^π : Peak probably includes the J ^π =1/2 ⁺ member of the same band.
254 ^g	5/2 ⁺	2	248 ^a	
315 ^f	5/2 ⁺	2	20	
342			3	
364		(3)	7	
382	3/2 ⁺ ,5/2 ⁺	2	7	
425 ^h	1/2 ⁻	1	30	
464 ^h	5/2 ⁻	3	41	
483		2,3	8	L: Adopted L=4, from (p,α) (1982Ha17).
521 ^h	3/2 ⁻	1	41	
589 ^h	9/2 ⁻	5	14	L: The angular-distribution graphs (fig. 6) of 1977Pa23 indicate a level at 539 keV, which evaluator assumes is actually this level (589 keV).
681 ^h	7/2 ⁻	3	20	
719	3/2 ⁺ ,5/2 ⁺	2	9	J ^π : Assigned as (5/2 ⁻ ,7/2 ⁻) from L=(3) in (p,α). (7/2 ⁻) is adopted, based on band and conf assignment.
780		(4)	2	
816 ^j	3/2 ⁺	2	44	J ^π : L=2 indicates 3/2 ⁺ ,5/2 ⁺ . Vibrational assignment gives 3/2 ⁺ .
875 ^k	1/2 ⁺	0	44	
908		1,2	38	
933	7/2 ⁺ ,9/2 ⁺	4	12	J ^π : 9/2 ⁺ in Adopted Levels.
1045			8	
1156 ⁱ	11/2 ⁻	5	9	J ^π : L=5 indicates 9/2 ⁻ ,11/2 ⁻ . Band assignment and population in this reaction give preference to 11/2 ⁻ .
1179	(1/2 ⁺)	(0)	8	
1201			7	
1267		>3	10	
1297		^c	≈6	
1309		^c	≈7	
1334	1/2 ⁻ ,3/2 ⁻	1	20	
1405			12	L: Cross-section ratio (fig. 10 of 1977Pa23) suggests L=4,(3).
1427	3/2 ⁺ ,5/2 ⁺	2	16	
1449			9	L: Cross-section ratio (fig. 10 of 1977Pa23) suggests L=3.
1480		≤2	10	
1502		2,3	12	
1521		2,3	14	
1589	1/2,3/2 ⁻	0,1	10	
1617			4	
1636			5	
1687		≤2	16	

Continued on next page (footnotes at end of table)

$^{158}\text{Dy}(\text{}^3\text{He,d})$ **1977Pa23 (continued)** ^{159}Ho Levels (continued)

<u>E(level)[†]</u>	<u>J^π[‡]</u>	<u>L[#]</u>	<u>S^{@&}</u>	Comments
1752	1/2 ⁺	0	31	
1789			9	
1805	(7/2 ⁺ ,9/2 ⁺)	(4)	11	
1822		(3)	10	L: From the cross-section ratio (fig. 10 of 1977Pa23).
1855		2,3	26	

[†] Uncertainty is 2 keV for strongly populated levels, from a general statement by the authors.

[‡] From the list of populated levels (table 3) in [1977Pa23](#), based on L value, intensity patterns, and band assignment. These assignments agree with those in the ^{159}Ho Adopted Levels, except as noted.

[#] Deduced by [1977Pa23](#) from comparison of measured angular distributions with DWBA calculations and ratio of ($^3\text{He,d}$) and (α,t) cross sections.

[@] Label= $d\sigma/d\Omega(d,t)$.

[&] Values in $\mu\text{b/sr}$, measured at 45°.

^a Value is larger than expected for the $\pi 5/2[402]$ Nilsson state. This may reflect contributions from the L=2 members of the $\pi 3/2[411]$ and/or $\pi 1/2[411]$ bands.

^b From analysis of doublet 212+218 peak (see fig. 6 of [1977Pa23](#)).

^c L=(2) for combined 1292+1310 levels.

^d Band(A): $\pi 7/2[523]$ band.

^e Band(B): $\pi 7/2[404]$ bandhead.

^f Band(C): $\pi 1/2[411]$ band.

^g Band(D): $\pi 5/2[402]$ bandhead.

^h Band(E): $\pi 1/2[541]$ band.

ⁱ Band(F): $\pi 9/2[514]$ band member.

^j Band(G): $K^\pi=3/2^+$ bandhead. probable bandhead of the K-2 γ vibration built on $\pi 7/2[404]$, with an admixture of $\pi 3/2[402]$.

^k Band(H): $K^\pi=1/2^+$ bandhead. probable bandhead of the K-2 γ vibration built on $\pi 5/2[402]$, with an admixture of $\pi 1/2[400]$.

$^{158}\text{Dy}(^3\text{He,d})$ 1977Pa23Band(F): $\pi 9/2[514]$ band member11/2⁻ 1156Band(E): $\pi 1/2[541]$ band7/2⁻ 6819/2⁻ 5893/2⁻ 5215/2⁻ 4641/2⁻ 425Band(C): $\pi 1/2[411]$ band5/2⁺ 315Band(D): $\pi 5/2[402]$ bandhead5/2⁺ 2543/2⁺ 212Band(B): $\pi 7/2[404]$ bandhead7/2⁺ 166Band(A): $\pi 7/2[523]$ band9/2⁻ 987/2⁻ 0

 $^{158}\text{Dy}(\text{}^3\text{He,d})$ 1977Pa23 (continued)

Band(G): $K^\pi=3/2^+$ bandhead		Band(H): $K^\pi=1/2^+$ bandhead	
<u>$3/2^+$</u>	<u>816</u>	<u>$1/2^+$</u>	<u>875</u>

 $^{159}_{67}\text{Ho}_{92}$