¹⁶¹**Dy**(³**He**,*α*) **1981Ji01**

		History	
Туре	Author	Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 176, 1 (2021)	1-May-2021

Additional information 1.

 $E(^{3}He)=24$ MeV. Multi-angle magnetic spectrograph; emitted α particles detected in nuclear emulsions; enriched (96% ^{161}Dy) targets. Measured angular distribution. Absolute cross sections were determined (with 25% uncertainty) by normalizing measured yield of elastically scattered ^{3}He particles (over range of laboratory angles from 32.5° to 57.5°) to optical-model cross sections calculated using the average ^{3}He parameters given in 1969EIZY.

Empirical L=5 and L=6 angular-distribution shapes were determined from ${}^{162}\text{Dy}({}^{3}\text{He},\alpha)$ transitions to known $h_{11/2}$ and $i_{13/2}$ states in ${}^{161}\text{Dy}$, and made it possible to distinguish between L=5 and L=6 transitions to states in ${}^{160}\text{Dy}$.

 $J^{\pi}(^{161}\text{Dy})=5/2^+$. Configuration= $5/2^+[642]$.

¹⁶⁰Dy Levels

E(level)	$J^{\pi \dagger}$	L	S ^{‡#}	Comments		
87 <mark>&</mark>	2+					
283 <mark>&</mark> 5	4+	(6)	0.09			
583 ^{&} 5	6+	6	0.45			
967 <mark>&</mark> 5	8+	6	0.15			
1286 ^{<i>a</i>} 5	1-					
1359 ^a 5	2-		$0.04^{@}$			
1399 <mark>a</mark> 5	3-		$0.06^{@}$			
1535 ^a 5	4-		$0.08^{\textcircled{0}}{0}$			
1607 <mark>b</mark> 5	4+		0.06	J^{π} ,S: L=6 assumed (1981Ji01). These authors report J^{π} =(4 ⁺).		
1651 ^a 5			0.06 [@]	J ^{π} : 1981Ji01 report J ^{π} =(5 ⁻) and assign it as the 5 ⁻ member of the K^{π} =1 ⁻ octupole band. However, subsequent studies place this state lower in the level scheme, at 1586. Also, this peak may correspond to two ¹⁶⁰ Dy levels, having J ^{π} =4 ⁻ ,5 ⁻ and 4 ⁺ ,5,6 ⁺ , respectively.		
1723 ^b 5	6+	6	0.33			
1785 ^C 5	4-		0.12 [@]	J^{π} : 1981Ji01 report $J^{\pi} = (5^{-})$.		
1860 ^C 7	5-	5	0.37	J^{π} : 1981Ji01 report $J^{\pi}=6^{-}$, (3 through 8) ⁻ .		
1948 [°] 7	(6) ⁻	5	0.18	J^{π} : 1981Ji01 report $J^{\pi}=7^{-}$, (3 through 8) ⁻ .		
1974 ⁰ 7	$(8)^{+}$	6	0.20	J^{π} : 1981Ji01 report $J^{\pi} = 8^+$, (4 through 9) ⁺ .		
2075 7	7*	5	0.85	J ^{π} : tentatively assigned as the 7 ⁺ member of the $K^{\pi}=4^+$ band at 1694 by 1987Ri08 in (α ,2n γ). However, population of this level via L=5 transfer here indicates π = 1981Ji01 assign this level as the head of a $K^{\pi}=3^-$ band. Its γ deexcitation suggests J=7.		
2125 7	3-	(5,6)	0.29 [@]	J^{π} : 1981Ji01 report $J^{\pi} = (4^{-})$.		
2188 7				J^{π} : peak may correspond to two ¹⁶⁰ Dy levels, one of which has $J^{\pi}=4^+,5^+,6^+$. 1981Ji01 report $J^{\pi}=(5^-)$.		
2279 ^d 15 2372 2444 2515	8-	5	1.65			
2577 15	3^+ to 9^+	6	0.73	J^{π} : L=6 pickup of neutron in an i13/2 state.		
$\begin{array}{c} 1535^{a} \ 5\\ 1607^{b} \ 5\\ 1651^{a} \ 5\\ 1651^{a} \ 5\\ 1785^{c} \ 5\\ 1785^{c} \ 5\\ 1860^{c} \ 7\\ 1948^{c} \ 7\\ 1974^{b} \ 7\\ 2075 \ 7\\ 2125 \ 7\\ 2125 \ 7\\ 2188 \ 7\\ 2279^{d} \ 15\\ 2372\\ 2444\\ 2515\\ 2577 \ 15\\ \end{array}$	4^{-} 4^{+} 6^{+} 4^{-} 5^{-} $(6)^{-}$ $(8)^{+}$ 7^{+} 3^{-} 8^{-} 3^{+} to 9^{+}	6 5 6 5 (5,6) 5	0.08 ^(a) 0.06 0.06 ^(a) 0.33 0.12 ^(a) 0.37 0.18 0.20 0.85 0.29 ^(a) 1.65	 J^π, S: L=6 assumed (1981Ji01). These authors report J^π=(4⁺). J^π: 1981Ji01 report J^π=(5⁻) and assign it as the 5⁻ member of the K^π=1⁻ octupole band. However, subsequent studies place this state lower in the level scheme, at 15 Also, this peak may correspond to two ¹⁶⁰Dy levels, having J^π=4⁻,5⁻ and 4⁺,5,6⁺ respectively. J^π: 1981Ji01 report J^π=(5⁻). J^π: 1981Ji01 report J^π=6⁻, (3 through 8)⁻. J^π: 1981Ji01 report J^π=7⁻, (3 through 8)⁻. J^π: 1981Ji01 report J^π=8⁺, (4 through 9)⁺. J^π: tentatively assigned as the 7⁺ member of the K^π=4⁺ band at 1694 by 1987Ri08 (α,2nγ). However, population of this level via L=5 transfer here indicates π= 1981Ji01 assign this level as the head of a K^π=3⁻ band. Its γ deexcitation suggest J=7. J^π: 1981Ji01 report J^π=(4⁻). J^π: peak may correspond to two ¹⁶⁰Dy levels, one of which has J^π=4⁺,5⁺,6⁺. 1981J report J^π=(5⁻). J^π: L=6 pickup of neutron in an i13/2 state. 		

[†] From the adopted values. Where these differ from those of 1981Ji01, this is indicated.

[‡] $\sigma(\exp)/\sigma(DWUCK)$.

Cross-section calculations carried out using the code DWUCK and average optical-model parameters (1969EIZY).

[@] Relative strength derived assuming L=5.

¹⁶¹**Dy**(³**He**, α) **1981Ji01** (continued)

¹⁶⁰Dy Levels (continued)

& Band(A): ground-state band.

- ^a Band(A): ground-state band. ^a Band(B): $K^{\pi}=1^{-}$ band. Configuration=(ν 5/2[642] ν 3/2[521]). ^b Band(C): S, or 'Super' band. ^c Band(D): $K^{\pi}=4^{-}$ band. Configuration=(ν 5/2[642] + ν 3/2[521]). ^d Band(E): $K^{\pi}=8^{-}$ band. Configuration=(ν 11/2[505] + ν 5/2[642]).

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						Band (E): $K^{\pi}=8^{-}$ band		
		Band(C): S, or	'Super'			8-	2279	
		band		Band(D): I	$X^{\pi}=4^{-}$ band			
		(8)+	1974	(6)-	1948			
					1940			
				5-	1860			
				4-	1785			
		6+	1723					
	Band(B): K [*] =1 band	<u>.</u>	1120					
	1651	4+	1607					
		4	1007					
	4- 1535							
	3- 1399							
	2- 1359							
	1- 1286							
Band(A): Ground-state								
Danu								
<u>8+</u> <u>967</u>								
6+ 583								
0 505								
4+ 283								
2 ⁺ 87								
		1600						
		$^{100}_{66}\text{Dy}_{9}$	4					