^{161}Dy(^{3}He,α) 1981Ji01

Type	Author	History 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 1969ElZY.

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

J^{π}(^{161}Dy)=5/2^{+}. Configuration=5/2^{+}[642].

^{160}Dy Levels

E(level)	J$^{\pi}$ †	L	S ‡#	Comments
87 &	2^{+}			
283 & 5	4^{+}	(6)	0.09	
583 & 5	6^{+}	6	0.45	
967 & 5	8^{+}	6	0.15	
1286 a 5	1^{-}			
1359 a 5	2^{-}		0.04 @	
1399 a 5	3^{-}		0.06 @	
1535 a 5	4^{-}		0.08 @	
1607 b 5	4^{+}		0.06	J$^{\pi}$,S: L=6 assumed (1981Ji01). These authors report J^{π}=(4^{+}).
1651 a 5			0.06 @	J$^{\pi}$: 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$^{\pi}$: 1981Ji01 report J^{π}=(5^{-}).
1860 c 7	5^{-}	5	0.37	J$^{\pi}$: 1981Ji01 report J^{π}=6^{-}, (3 through 8)$^{-}$.
1948 c 7	(6)$^{-}$	5	0.18	J$^{\pi}$: 1981Ji01 report J^{π}=7^{-}, (3 through 8)$^{-}$.
1974 b 7	(8)$^{+}$	6	0.20	J$^{\pi}$: 1981Ji01 report J^{π}=8^{+}, (4 through 9)$^{+}$.
2075 7	7^{+}	5	0.85	J$^{\pi}$: tentatively assigned as the 7^{+} member of the K^{π}=4^{+} band at 1694 by 1987Ri08 in (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 suggests J=7.
2125 7	3^{-}	(5,6)	0.29 @	J$^{\pi}$: 1981Ji01 report J^{π}=(4^{-}).
2188 7				J$^{\pi}$: peak may correspond to two ^{160}Dy levels, one of which has J^{π}=4^{+},5^{+},6^{+}. 1981Ji01 report J^{π}=(5^{-}).
2279 d 15	8^{-}	5	1.65	
2372				
2444				
2515				
2577 15	3^{+} to 9^{+}	6	0.73	J$^{\pi}$: L=6 pickup of neutron in an i13/2 state.

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

‡ σ(exp)/σ(DWUCK).

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

@ Relative strength derived assuming L=5.

Continued on next page (footnotes at end of table)

^{161}Dy(^{3}He,α) 1981Ji01 (continued)

^{160}Dy Levels (continued)

[&] 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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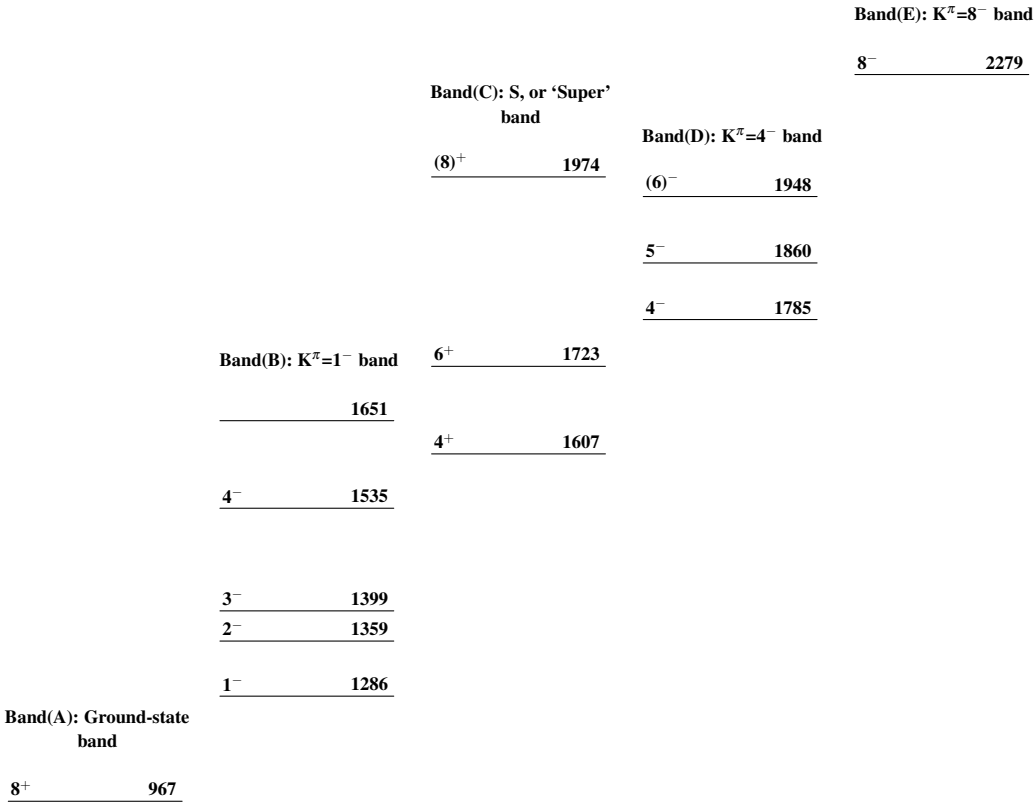

$^{160}_{66}Dy_{94}$