

$^{173}\text{Yb}(\alpha, t), (^3\text{He}, d)$ 1972On02

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	E. Browne, Huo Junde		NDS 87, 15 (1999)	1-Nov-1998

Target: 95% enriched $^{173}\text{Yb}(J^\pi=5/2^-)$. Spectrometer: magnetic.

$^{173}\text{Yb}(\alpha, t)$, $E=28.5$ MeV, FWHM=12 keV, $\theta=20^\circ$, 60° , and 75° .

$^{173}\text{Yb}(^3\text{He}, d)$, $E=12$ MeV, FWHM=16-20 keV, $\theta=30^\circ$, 38° , and 50° .

Results have been interpreted using the Nilsson model with pairing and Coriolis mixing included. The only orbitals considered are those for which the transferred proton is coupled to the $5/2[512]$ neutron of the target nucleus. See Adopted Levels for evaluator's spin assignments.

 ^{174}Lu Levels

Band(E,Q) $K^\pi=3^+$ band member. Proposed Configuration= $(\pi 1/2[541])+(\nu 5/2[512])$. This band is Coriolis mixed with Configuration= $(\pi 1/2[541])+(\nu 5/2[512])$.

Band(L,M) $K^\pi=2^+$ band member. Proposed Configuration= $(\pi 9/2[514])-(\nu 5/2[512])$.

E(O,Q,R) Observed in $(^3\text{He}, d)$ only.

E(level) [‡]	J^π	$T_{1/2}$	L^\dagger	Comments
0.0 [#]	1 ⁻		(4)	
44 [#]	2 ⁻		(4)	
112 [#]	3 ⁻		(4)	
170 [@]	6 ⁻	142 d 2	(4)	$T_{1/2}$: from Adopted Levels.
202 [#]	4 ⁻			
239 ^{&}	3 ⁺			
257 ^{&}	4 ⁺			
281 ^{&}	2 ⁺ ⁱ			
300 ^{&}	5 ⁺			
323 ^j				
367 ^{&}	6 ⁺			
413	3 ⁺			
428 ^h				
455 ^a	5 ⁻		(2)	
506	4 ⁺			
516 ^b	1 ⁻		(2)	
527 ^c	(7 ⁺)			
553 ^b	0 ⁻		(2)	
561				
≈578				
620 ^b	3 ⁻		(2)	
637 ^b	2 ⁻		(2)	
640	5 ⁺			
659 ^c	8 ⁺		(5)	
692 ^g	3 ⁺		5	
714 ^{gk}				
723 ^h				
746 ^{&}	(6 ⁺)			
771	4 ⁺		5	
809 ^g				
831				

Continued on next page (footnotes at end of table)

$^{173}\text{Yb}(\alpha, t), (^3\text{He}, d)$ **1972On02 (continued)** ^{174}Lu Levels (continued)

$E(\text{level})^{\ddagger}$	J^{π}	L^{\dagger}	$E(\text{level})^{\ddagger}$	J^{π}	$E(\text{level})^{\ddagger}$	J^{π}	$E(\text{level})^{\ddagger}$
875	5^{+}	5	1261 ^d	3^{+}	1535 ^{dl}	(6^{+})	1829
906			1286 ^h		1558 ^f	(5^{+})	1847
923			1293 ^e	2^{+}	1592		1868
953			1301 ^h		1609		1903
1007			1328 ^d	4^{+}	1640		1927
1028			1363		1664		1940
1061 ^h			1379		1689		1979
1108			1391		1716 ^l		2012
1132			1422 ^d	5^{+}	1738		2096
1166			1438 ^f	(4^{+})	1753		2120
1209			1460 ^h		1771		2155
1240 ^h			1476		1801		

[†] L transfer values have been inferred (within one unit) from comparison of experimental cross section ratios $\sigma(^3\text{He}, d)/\sigma(\alpha, t)$ with theoretical values. Spin assignments are based on rotational structure, L transfers, and measured cross sections (fingerprint). L=4 have been assumed by 1972On02 for the g.s., 44, 112, and 170 keV states for normalization of the experimental cross sections.

[‡] Average from $(^3\text{He}, d)$ and (α, t) . Energy uncertainties are ≈ 1 keV except for levels populated by very weak peaks or unresolved doublets.

Band(A): $K^{\pi}=1^{-}$ ground-state rotational band member. Proposed Configuration= $(\pi 7/2[404])-(\nu 5/2[512])$.

@ Band(B): $K^{\pi}=6^{-}$ band member. Proposed Configuration= $(\pi 7/2[404])+(\nu 5/2[512])$.

& Band(C): $K^{\pi}=2^{+}$ band member. proposed Configuration= $(\pi 1/2[541])-(\nu 5/2[512])$. This band is Coriolis mixed with Configuration= $(\pi 1/2[541])+(\nu 5/2[512])$ $\nu 5/2[512]$.

^a Band(D): $K^{\pi}=5^{-}$ band member. Proposed Configuration= $(\pi 5/2[402])+(\nu 5/2[512])$.

^b Band(E): $K^{\pi}=0^{-}$ band member. Proposed Configuration= $(\pi 5/2[402])-(\nu 5/2[512])$.

^c Band(F): $K^{\pi}=7^{+}$ band member. Proposed Configuration= $(\pi 9/2[514])+(\nu 5/2[512])$.

^d Band(G): $K^{\pi}=3^{+}$ band member. Proposed Configuration= $(\pi 1/2[530])+(\nu 5/2[512])$.

^e Band(H): $K^{\pi}=2^{+}$ band member. Proposed Configuration= $(\pi 1/2[530])-(\nu 5/2[512])$.

^f Band(I): $K^{\pi}=(4^{+})$ band member. Proposed Configuration= $(\pi 3/2[532])+(\nu 5/2[512])$.

^g Possible unresolved multiplet.

^h Observed in (α, t) only.

ⁱ See Adopted Levels for adopted spin.

^j Doublet.

^k Observed in $(^3\text{He}, d)$ only.

^l Possible unresolved doublet.

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Band(C): $K^\pi=2^+$ band member

(6^+) 746

Band(E): $K^\pi=0^-$ band member

2^- 637
 3^- 620

Band(F): $K^\pi=7^+$ band member

8^+ 659

0^- 553

1^- 516

(7^+) 527

Band(D): $K^\pi=5^-$ band member

5^- 455

6^+ 367

5^+ 300

2^+ 281

4^+ 257

3^+ 239

Band(A): $K^\pi=1^-$ ground-state rotational band member

4^- 202

Band(B): $K^\pi=6^-$ band member

6^- 170

3^- 112

2^- 44

1^- 0.0

$^{173}\text{Yb}(\alpha, t), (^3\text{He}, d)$ 1972On02 (continued)

		Band(I): $K^\pi=(4^+)$ band member
	<u>(5^+)</u>	<u>1558</u>
Band(G): $K^\pi=3^+$ band member		
	<u>(6^+)</u>	<u>1535</u>
		<u>(4^+)</u>
		<u>1438</u>
	<u>5^+</u>	<u>1422</u>
	<u>4^+</u>	<u>1328</u>
		Band(H): $K^\pi=2^+$ band member
	<u>2^+</u>	<u>1293</u>
	<u>3^+</u>	<u>1261</u>