^{170}Yb(^{3}He,d), (α,t)   1973Gr23

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin, E. A. Mccutchan	NDS 151, 334 (2018)	30-Jun-2018

1973Gr23: E(^{3}He)=24 MeV, θ=38°, 48°; E(α)=26 MeV, θ=90°, 120°; Yb targets enriched to 81.4% in ^{170}Yb; measured E(level) (mag spect, FWHM=18 keV for ^{170}Yb(^{3}He,d), θ=38°; FWHM=17 keV for ^{170}Yb(α,t), θ=90°), differential cross sections, (^{3}He,d)/(α,t) cross-section ratios; DWBA and Nilsson model calculations.

All data are from 1973Gr23.

^{171}Lu Levels

E(level)[†]	J$^\pi$[‡]	L[#]	C^{2}S′[@]	Comments
0.0[&]		4	0.78	
73 2		1+3		E(level): complex; composed of known 71.1 level (assigned L=1) and known 73.0 level (assigned L=3).
				C^{2}S′: 0.27 if entire cross section is for 71.2 level; 0.79 if entire cross section is for 73.0 level.
160[a] 2		5	1.8	
208 2		1+0		E(level): complex; composed of known 206.3 level (assigned L=1) and known 208.2 level (assigned L=0).
				C^{2}S′: 0.18 if entire cross section is for either 206.3 level or 208.2 level.
223[b] 2		2	0.20	
296[c] 2		2	0.85	
335[b] 2		2	0.14	
381[a] 2		3	0.14	
396[c] 3		2	0.03	
472[d] 2		5	0.08	
522[c] 2		4	0.07	
597[d] 2		5	2.4	
625[a] 2		5	0.19	
801 2		2		
968[e] 2	5/2$^-$	3	0.15	
1047 2	3/2$^+$	2	0.19	Possible 3/2[402] state.
1089 2		3		
1111[f] 4	3/2$^-$	1	0.30	
1139 2	1/2$^+$	0	0.18	E(level): from ^{170}Yb(^{3}He,d); 1139 and 1156 levels unresolved in ^{170}Yb(α,t) (E=1151 for doublet).
				Possible 1/2[400] state.
1156 2	1/2$^+$	0	0.04	E(level): see comment with 1139 level.
				Possible 1/2[400] state.
1182[e] 4	9/2$^-$	5	0.29	
1221[f] 3	7/2$^-$	3	0.31	
1256 3				
1546 4				
1569 4	13/2$^+$	6	0.46	1/2[660] state.
1589 6				
1606 3				

[†] Average from ^{170}Yb(^{3}He,d) at θ=38° and ^{170}Yb(α,t) at θ=90°, except where noted. The authors report ΔE=2 keV for strongly-populated states; the evaluator has assigned a minimum ΔE of 2 keV, and increased ΔE to cover the spread in E measured in (^{3}He,d) and (α,t) when the values are more than 4 keV apart.

[‡] Authors′ values based on L-values and spectroscopic factors. See ^{171}Lu Adopted Levels for evaluator′s assignments. 1973Gr23 report and interpret J$^\pi$ only where not assigned in their concurrent study of ^{171}Lu from ^{169}Tm(α,2nγ).

[#] Authors′ values, based on comparison of measured (^{3}He,d) to (α,t) cross-section ratios with those predicted by DWBA

^{170}Yb(^{3}He,d), (α,t)   **1973Gr23** **(continued)**

^{171}Lu Levels (continued)

calculations (normalization factor=4.42 for (^{3}He,d), 46 for (α,t)) and on results of authors′ concurrent study of ^{171}Lu from ^{169}Tm(α,2nγ). These values are consistent with band assignments for levels based on comparison between the characteristic pattern of cross sections within bands (fingerprint) and calculations using Nilsson model wave functions. The evaluator considers that these data provide only weak arguments for adopted J$^\pi$.

@ Nuclear structure factor, dσ/dΩ(exp)/(2*N dσ/dΩ(DWBA)). Data are from ^{170}Yb(^{3}He,d) at 38°; see 1973Gr23 for values from ^{170}Yb(α,t) at 90°.

& Band(A): 7/2[404] band.

^{a} Band(B): 1/2[541] band.

^{b} Band(C): 1/2[411] band.

^{c} Band(D): 5/2[402] band.

^{d} Band(E): 9/2[514] band.

^{e} Band(F): 3/2[532] band.

^{f} Band(G): 1/2[530] band.

^{170}Yb(^{3}He,d), (α,t)   1973Gr23

Band(F): 3/2[532] band

$9/2^-$ 1182

$5/2^-$ 968

Band(B): 1/2[541] band

625

Band(E): 9/2[514] band

597

Band(D): 5/2[402] band

522

472

396

381

Band(C): 1/2[411] band

335

296

223

160

Band(A): 7/2[404] band

0.0

${}^{171}_{71}$Lu$_{100}$

^{170}Yb(^{3}He,d), (α,t)　　1973Gr23 (continued)

Band(G): 1/2[530] band

7/2^{-}　　　　1221

3/2^{-}　　　　1111

$^{171}_{71}$Lu$_{100}$