^{170}Er(^{3}He,d), (α,t)   1994Sc51,1974Ch44

History

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

1994Sc51: E(^{3}He)=30 MeV; Q3D spectrograph; θ(lab)=15°. Measured E(d), dσ/dΩ(15°).

1974Ch44: E(α)=27 MeV, θ=45°, 60°; E(^{3}He)=24 MeV, θ=25°, 60° (plus 7 other angles); 96.89% ^{170}Er oxide targets; measured E(d), E(t) (mag spect with photographic emulsions, FWHM=16-18 keV), (^{3}He,d) angular distributions, (^{3}He,d) and (α,t) differential cross sections and cross-section ratios.

Other: 1975Bu02.

^{171}Tm Levels

E(level)[†]	J$^\pi$[‡]	S[#]	Comments
0.0[@]	1/2$^+$		E(level): E=2.5 5 for 0.0+5.0 doublet in 1994Sc51.
			dσ/dΩ (μb/sr, 15°)=81 4 In (^{3}He,d) for doublet (1994Sc51).
5.0[@]	3/2$^+$	0.65	E(level): rounded value from Adopted Levels. E=2.5 5 for 0.0+5.0 doublet in 1994Sc51. See comment with 0.0 level.
			C^{2}S′=0.67 from (^{3}He,d).
116.7[@] 5	5/2$^+$	0.28	dσ/dΩ (μb/sr, 15°)=48 3 In (^{3}He,d) (1994Sc51).
			C^{2}S′=0.37 from (^{3}He,d).
129[@] 2	7/2$^+$	0.15	E(level): from 1974Ch44; E=134.0 25 in 1994Sc51.
			dσ/dΩ (μb/sr, 15°)=4.2 11 In (^{3}He,d) (1994Sc51).
			C^{2}S′=0.28 from (^{3}He,d).
325.9[@] 10	9/2$^+$	0.04	dσ/dΩ (μb/sr, 15°)=3.9 10 In (^{3}He,d) (1994Sc51).
			C^{2}S′=0.07 from (^{3}He,d).
346.3[@] 14			dσ/dΩ (μb/sr, 15°)=2.4 10 In (^{3}He,d) (1994Sc51).
424[&] 2	7/2$^-$	0.01	E(level): from 1974Ch44; absent in 1994Sc51.
			C^{2}S′=0.02 from (^{3}He,d).
≈520[&]	9/2$^-$	0.02	E(level): from 1974Ch44; absent in 1994Sc51.
			C^{2}S′=0.04 from (^{3}He,d).
635.9[a] 9	7/2$^+$	1.81	E=635 2 in 1974Ch44 for complex peak (wider than normal); may include component from 11/2$^-$ 7/2[523] state (adopted E(level)=637.1).
			dσ/dΩ (μb/sr, 15°)=7.8 12 In (^{3}He,d) (1994Sc51).
			C^{2}S′=1.70 from (^{3}He,d).
675.7[b] 18	3/2$^+$	0.04	dσ/dΩ (μb/sr, 15°)=2.6 8 In (^{3}He,d) (1994Sc51).
			C^{2}S′=0.02 from (^{3}He,d).
737.4[b] 6	5/2$^+$	0.24	dσ/dΩ (μb/sr, 15°)=26.2 23 In (^{3}He,d) (1994Sc51).
			C^{2}S′=0.33 from (^{3}He,d).
751.1[c] 4	5/2$^-$	0.39	E=751 2 in 1974Ch44 for complex peak (wider than normal); may include component from 1/2$^-$ 1/2[541] state (adopted E(level)=754.8).
			dσ/dΩ (μb/sr, 15°)=63 3 In (^{3}He,d) (1994Sc51).
			C^{2}S′=0.64 from (^{3}He,d).
824.3[c] 13	9/2$^-$	1.19	E=823 2 in 1974Ch44 for complex peak (wider than normal); may include component from 7/2$^+$ 3/2[411] state (adopted E(level)=822.4).
			dσ/dΩ (μb/sr, 15°)=3.0 9 In (^{3}He,d) (1994Sc51).
			C^{2}S′=1.11 from (^{3}He,d).
884.1[c] 5	3/2$^-$	0.05	L(^{3}He,d)=1 in 1974Ch44.
			dσ/dΩ (μb/sr, 15°)=30.8 22 In (^{3}He,d) (1994Sc51).
			C^{2}S′=0.13 from (^{3}He,d).
913.1[d] 3	5/2$^+$	0.60	dσ/dΩ (μb/sr, 15°)=78 3 In (^{3}He,d) (1994Sc51).
			C^{2}S′=0.65 from (^{3}He,d).
998.0[d] 15			dσ/dΩ (μb/sr, 15°)=2.1 10 In (^{3}He,d) (1994Sc51).

^{170}Er(^{3}He,d), (α,t)   **1994Sc51,1974Ch44 (continued)**

^{171}Tm Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	S[#]	Comments
1034.9^c 6	7/2$^-$	0.09	dσ/dΩ (μb/sr, 15°)=14.3 *15* In (^{3}He,d) (1994Sc51).
			C^{2}S′=0.13 from (^{3}He,d).
1235? 2			E(level): from 1974Ch44. Level is absent in 1994Sc51, so indicated as tentative here.
1285.0^f 3	5/2$^+$		dσ/dΩ (μb/sr, 15°)=61 *3* In (^{3}He,d) (1994Sc51).
			L(^{3}He,d)=2 in 1974Ch44.
1305.1^e 13	11/2$^-$	0.80	L(^{3}He,d)=5 for E=1309 *2* level in 1974Ch44.
			dσ/dΩ (μb/sr, 15°)=5.0 *11* In (^{3}He,d) (1994Sc51).
			C^{2}S′=0.95 from (^{3}He,d).
1399 3			dσ/dΩ (μb/sr, 15°)=2.1 *10* In (^{3}He,d) (1994Sc51).
1568.1 6	1/2$^+$		L(^{3}He,d)=0 in 1974Ch44.
			dσ/dΩ (μb/sr, 15°)=51 *4* In (^{3}He,d) (1994Sc51).
1785.2 9			dσ/dΩ (μb/sr, 15°)=9.2 *15* In (^{3}He,d) (1994Sc51).
1813.0 10			dσ/dΩ (μb/sr, 15°)=19.8 *24* In (^{3}He,d) (1994Sc51).
1824.5 9	1/2$^+$		L(^{3}He,d)=0 for 1826 *2* level (1974Ch44).
			dσ/dΩ (μb/sr, 15°)=37.1 *28* In (^{3}He,d) (1994Sc51).
1848.5 10			E(level): 1854 *2* in 1974Ch44 is possibly for 1849+1860 doublet.
			dσ/dΩ (μb/sr, 15°)=23.9 *24* In (^{3}He,d) (1994Sc51).
1859.8 12			E(level): 1854 *2* in 1974Ch44 is possibly for 1849+1860 doublet.
			dσ/dΩ (μb/sr, 15°)=14.2 *22* In (^{3}He,d) (1994Sc51).
1908.8 10			dσ/dΩ (μb/sr, 15°)=23.2 *20* In (^{3}He,d) (1994Sc51).
1925.7 11			dσ/dΩ (μb/sr, 15°)=16.6 *18* In (^{3}He,d) (1994Sc51).
1959.4 13			dσ/dΩ (μb/sr, 15°)=8.5 *15* In (^{3}He,d) (1994Sc51).
1979.4 17			dσ/dΩ (μb/sr, 15°)=4.7 *12* In (^{3}He,d) (1994Sc51).
2015.3 12			dσ/dΩ (μb/sr, 15°)=15.1 *18* In (^{3}He,d) (1994Sc51).

[†] From (^{3}He,d), E=30 MeV, except as noted. Energies from (α,t) and (^{3}He,d) in 1974Ch44 agree within ±2 keV, and are
  consistent with the data of 1994Sc51 in most cases.
[‡] From 1974Ch44, based on (^{3}He,d) angular distributions and (^{3}He,d)/(α,t) cross-section ratios. See ^{171}Tm Adopted Levels for
  evaluator′s assignments.
[#] Nuclear structure factor from (α,t). For complex peaks, entire cross section is assumed to be for state indicated (1974Ch44).
  Nuclear structure factor, C^{2}S′, from (^{3}He,d) is given In comments.
[@] Band(A): 1/2[411] band.
[&] Band(B): 7/2[523] band.
[a] Band(C): 7/2[404] band.
[b] Band(D): 3/2[411] band.
[c] Band(E): 1/2[541] band.
[d] Band(F): 5/2[402] band.
[e] Band(G): 9/2[514] band.
[f] Band(H): 5/2[413] band.

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Band(D): 3/2[411] band

5/2^{+} 737.4

3/2^{+} 675.7

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

7/2^{+} 635.9

Band(B): 7/2[523] band

9/2^{-} ≈520

7/2^{-} 424

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

          346.3

9/2^{+} 325.9

7/2^{+} 129

5/2^{+} 116.7

3/2^{+} 5.0

1/2^{+} 0.0

$^{171}_{69}$Tm$_{102}$

^{170}Er(^{3}He,d), (α,t)   1994Sc51,1974Ch44 (continued)

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

11/2^{-} 1305.1

Band(H): 5/2[413] band

5/2^{+} 1285.0

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

7/2^{-} 1034.9

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

998.0

5/2^{+} 913.1

3/2^{-} 884.1

9/2^{-} 824.3

5/2^{-} 751.1

${}^{171}_{69}$Tm$_{102}$