^{46}Ti(d,n),(^{3}He,d) 1969Cu02,1967Ro13,1967Do03

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The following three groups all measured $\sigma(\theta)$ (spectrometer,emulsion) and performed DWBA analysis.
1967Do03: E(^{3}He)=12 MeV. Energy resolution=25 keV. θ=7.5°−172.5°.
1967Ro13: E(^{3}He)=16.5 MeV. θ=7°−60°.
1969Cu02: E(^{3}He)=10 MeV. Energy resolution=25 keV or 85 keV. θ=10°, 20°, 30°, 40°.
1971Ok06: ED≈11.2 MeV. Measured σ(E(n),θ); tof, stilbene. θ=10°−35°.
See 1977Ha45 for a more detailed presentation and comparison of the data from the references cited here including states observed only by 1967Ro13. Others: see 1995Bu05.

^{47}V Levels

E(level)†	Jπ‡	L#	C^{2}S@	Comments
0.0&	3/2$^-$	1&	0.04&a *1*	Weakness of transition indicates a small admixture of ((π 1f$_{7/2}$)^2(π 2p$_{3/2}$)) in expected (π 1f$_{7/2}$)^3.
88 *7*				
149& *7*	7/2$^-$	3&	0.58&	
263 *7*	3/2$^+$	2	0.08 *3*	
666b *8*				
1665 *7*	1/2$^+$	0	0.06 *2*	L: 1969Cu02 obtained L=0+1.
2081& *8*	3/2$^-$	1&	0.35&a *11*	Jπ: if Jπ=1/2$^-$, a spectroscopic factor would be obtained which alone would exceed the total 2p$_{1/2}$ strength by 15%.
2213 *8*	(3/2)$^-$	1	0.15a *5*	Jπ: 3/2 from comparison of S(+)(L=1) for ^{47}V and other V isotopes states (1989Bo18) discrepant with adopted Jπ=1/2$^-$.
2546 *8*	5/2$^-$	3	0.23 *7*	Jπ: since the 149 state takes most if not all of the T=1/2, 1f7/2 strength, the 2546 and 2723 states most probably are 1f5/2 (1967Ro13); however, see the comment on the 2.55-MeV state in (^{16}O,^{15}N).
2723 *8*	5/2$^-$	3	0.16 *5*	Jπ: see comment on 2546 state. L: 1967Do03 obtain L=2; however L=3 would also agree with their data but not as well as L=2 (evaluator).
2767 *8*	3/2$^-$	1	0.07a *2*	
3005&b *11*	3/2$^-$	1&	0.03&a *1*	1969Cu02 note that this state appears to be a doublet (L=1+3) with a width of 40 keV.
3241? *10*	3/2$^+$,5/2$^-$	2,3	0.04,0.26 *7*	Observed only by 1969Cu02.
3366& *8*	1/2$^-$	1&	0.07&a *2*	
3516 *15*				L,C^{2}S: 1971Ok06 obtain L=1, C^{2}S′=0.21 *7* for 3540 *+50−70*.
3595 *15*				L,C^{2}S: see comment on 3516 state.
3875 *15*				
3986 *15*				
4098b *12*	1/2$^-$	1	0.21a *7*	
4155 *20*				
4195 *20*				L,C^{2}S: 1971Ok06 obtain L=1+(3), C^{2}S′=0.30+(1.7) for 4250 *+50−70*.
4261b *12*	5/2$^-$	3	0.14 *4*	Jπ: since spectroscopic strength of this plus the 4300 state would be 70% greater than the IAS sum-rule limit of 0.17 if J=7/2 (1967Ro13). L,C^{2}S: see comment on 4195 state.
4296b *12*	7/2$^-$	3	0.20 *6*	IAS(^{47}Ti,161) (1971Ok06,1967Ro13,1967Do03). L,C^{2}S: see comment on 4195 state. Additional information 1.
4389&b *12*	1/2$^-$	1&	0.12&a *4*	
4516 *20*	1/2$^-$	1	0.02a *1*	
4613 *20*				
4763 *37*	1/2$^-$	1	0.05a *2*	E(level): unweighted av of 1967Ro13 and 1967Do03.

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^{46}Ti(d,n),(^{3}He,d) 1969Cu02,1967Ro13,1967Do03 (continued)

^{47}V Levels (continued)

E(level)[†]	Jπ[‡]	L[#]	C^{2}S[@]	Comments
5056 *20*				
5157 *20*				
5210 *20*				
5244 *20*	1/2$^-$	1	0.17[a] *5*	
5387 *20*				
5474 *20*				
5538 *20*				
5585[b] *12*	1/2$^-$	1	0.09 *3*	
5635[&b] *12*	3/2$^-$	1[&]	0.14[&] *4*	IAS(^{47}Ti,1545) (1971Ok06,1967Ro13,1967Do03).
5711 *20*				
5748 *20*				
5859 *20*				
5882 *20*				
5928 *20*				
6040 *20*		0		L: from shape of $\sigma(\theta)$ (1967Ro13).
6176 *20*				L,C^{2}S: 1971Ok06 obtain L=1, C^{2}S′=0.21 *7* for 6280 *+50−70*.
6284 *20*				L,C^{2}S: see comment on 6176 state.
6399 *20*				
6431 *20*				
6570 *20*				
6708 *20*				
6749 *20*				
6895 *20*				
6948 *20*				
7008 *20*				

[†] For E(level)<3500 keV, weighted average from 1969Cu02, 1967Ro13, and 1967Do03, except as noted. The higher-energy states were observed only by 1967Ro13, except as noted.

[‡] Assumed by 1967Ro13 for their DWBA calculations, except as noted.

[#] From DWBA analysis of 1967Ro13, except as noted. These values are in agreement with those extracted by 1969Cu02 and 1967Do03, except as noted.

[@] From 1967Ro13, except as noted. Normalized to C^{2}S(149)=0.58, based on the assumption that this state takes the full 1f7/2(T=1/2) strength. 1969Cu02 used a similar normalization method and obtained similar results. The results of 1967Do03 are about 30-40% lower. 1969Cu02 note that this difference may be attributed to the choice of the normalization constants which differ by a factor of 1.7.

[&] Also observed by 1971Ok06. Results consistent with data presented here.

[a] Σ C^{2}S′=4.0 for all L=1 transitions. Agreement with theory is probably fortuitous but does indicate that at least most of the 2p3/2 and 2p$_{1/2}$ strength has been observed (1967Ro13).

[b] Weighted average of 1967Ro13 and 1967Do03.