^{51}V(d,^{3}He),(pol d,^{3}He) 1988Kr02,1986FuZY

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Jun Chen and Balraj Singh	NDS 157, 1 (2019)	15-Apr-2019

J^π(^{51}V g.s.)=7/2$^-$.

1988Kr02: (d,^{3}He) E=52.9 MeV beam from the KVI in Groningen. Measured $\sigma(\theta$(c.m)≈5°−40°); magnetic spectrograph, position-sensitive detectors, scintillation detector, FWHM≈25 keV. DWBA analysis.

1986FuZY: (pol d,^{3}He) E=56 MeV at RCNP. Measured $\sigma(\theta)$, $A_y(\theta)$, θ(c.m.)≈6°−32°; magnetic spectrometer, position-sensitive proportional counter and ΔE-ΔE-E telescope (proportional counter, scintillator), beam polarization=80-83%.

Others:

1976Cr01: (d,^{3}He),E=30,80 MeV. Measured σ(E,θ), deduced L- values and spectroscopic factors for ground and first 2$^+$, 4$^+$ and 6$^+$ states.

1968Ne03: (d,^{3}He),E=34.4 MeV. Measured σ(E,θ) for eight levels up to 6.16 MeV. Deduced L values and spectroscopic factors. FWHM=85-125 keV.

1967Hi09: (d,^{3}He),E=52 MeV. Measured σ(E,θ) for nine levels up to 7650 keV. FWHM=200-400 keV. Deduced L values and spectroscopic factors.

All data are from 1988Kr02, except as noted.

$\Sigma C^2S(1f_{7/2})$ is similar to that found in (e,e′p) while ΣC^2S(L=0; E_x<8 MeV) and ΣC^2S(L=2; E_x<8 MeV) are not. See (e,e′p) for additional discussion.

^{50}Ti Levels

E(level)[†]	L	C^2S[‡]	Comments
0[#]	3[a]	0.41[@]	E(level): 0 *2*. L=3, C^2S=0.74 (1968Ne03). L=3, S=0.73 (1967Hi09).
1552[#] *4*	3[ab]	0.22[@b]	E=1560, L=3, C^2S=0.37 (1968Ne03). E=1550, L=3, S=0.39 (1967Hi09).
2675[#] *5*	3[ab]	0.41[@b]	E=2680, L=3, C^2S=0.75 (1968Ne03). E=2670, L=3, S=0.64 (1967Hi09).
3199[#] *6*	3[a]	0.65[@]	E=3200, L=3, C^2S=1.14 (1968Ne03). E=3220, L=3, S=1.05 (1967Hi09).
4147 *7*	0	0.008	
4177 *7*	3	0.047	
4317 *7*	3	0.022[@]	
4409[#] *7*	0	0.26[&]	E=4450, L=0, C^2S=0.77 (1968Ne03). E=4450 *100*, L=0, S=0.63 (1967Hi09).
4787 *7*	3	0.042[@]	
4928 *8*	2	0.051	
5191 *8*	0+2	0.006+0.019[&]	
5333 *8*	2	0.71	
5407[#] *8*	0+2	0.064+0.40[&]	E=5460, L=2, C^2S=1.67 (1968Ne03). E=4450 *100*, L=2, S=1.90 (1967Hi09).
5528 *8*	0+2	0.013+0.069[&]	
5771 *9*	0	0.046[&]	
5795 *9*	2	0.43	
5880 *9*	3	0.013[@]	E=5890, L=2, C^2S=0.82 (1968Ne03).
5945 *9*	2	0.028	
6041 *9*	0	0.42[&]	E=6050 *150*, L=0, S=1.10 (1967Hi09).
6137 *9*	3	0.021[@]	E=6160, L=0, C^2S=1.03 (1968Ne03).
6191 *9*	3	0.016[@]	
6248 *9*	3	0.013[@]	

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$^{51}V(d,^3He),(pol\ d,^3He)$ 1988Kr02,1986FuZY (continued)

^{50}Ti Levels (continued)

E(level)[†]	L	C^2S[‡]	Comments
6310 *9*	2	0.14	
6386 *9*	2	0.36	
6400 *9*	0	0.035[&]	
6461 *9*	2	0.023	E=6450 *150*, L=2, S=1.40 (1967Hi09).
6517 *9*	1	0.009	
6583 *10*	2	0.18	
6606[#] *10*	2	0.073	
6665 *10*	2	0.027	
6716 *10*	1	0.006	
6770 *10*	3	0.023[@]	
6847 *10*	2	0.067	
6963 *10*	0	0.017[&]	
7037 *10*	1	0.007	
7083 *10*	2	0.038	
7605[c] *11*	(0)[c]	[c]	E=7650 *200*, L=2, S=1.10 (1967Hi09).
7697[#c] *11*	(0)[c]	[c]	

[†] Uncertainties estimated by evaluators from statement by 1988Kr02 that the uncertainties range from 2 keV at 0 MeV to 10 keV at 7 MeV.

[‡] $C^2S=(2j+1)[d\sigma/d\Omega(exp)]/(N[d\sigma/d\Omega(DWBA)])$, where N=2.95. Separation energy method. See 1988Kr02 for results when the rms radius is kept constant.

[#] Also identified by 1986FuZY.

[@] $\Sigma C^2S=1.89$ is less than expected. If the $1f_{7/2}$ orbital radius is fixed at 4.10 fm, $\Sigma C^2S=1.63$ which is about two thirds of that expected from extensive shell model calculations (1988Kr02).

[&] $\Sigma C^2S=0.87$ is less than half that expected from extensive shell model calculations (1988Kr02).

[a] Shape of $A_y(\theta)$ very similar for these states (1986FuZY).

[b] no evidence of L=1 admixture ($C^2S<0.01$).

[c] Observed only at forward angles. Parentheses added by the evaluators.