^{51}V(^{3}He,α) 1975Ma06,1973Sm02

History

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

^{51}V g.s. target $J^{\pi}=7/2^{-}$.

1975Ma06: E=18 MeV beam from the Harwell Tandem Van de Graaff accelerator. Measured $\sigma(\theta)$ at θ=5°−175° with a magnetic spectrograph (FWHM≈22 keV). Deduced levels, J, π, L-transfers, spectroscopic factors from DWBA analysis Observed states up to 9.3 MeV.

1973Sm02: E=13, 22 MeV beam from the Argonne tandem Van de Graaff. Measured $\sigma(\theta)$ at θ(c.m.)≈5°−45° with a split-pole magnetic spectrometer (FWHM=30 keV). Deduced levels, J, π, L-transfers, spectroscopic factors from DWBA analysis. Observed states up to 4.8 MeV.

Others:

2006La12: (^{3}He,$\alpha\gamma$) E=30 MeV. Measured continuum γ-ray spectra, deduced level densities and γ strength functions.

Cross sections listed under comments are from 1975Ma06 and correspond to an angle where maximum value is obtained.

Additional information 1.

1965Br38: E=12-14 MeV. Measured $\sigma(\theta)$.

^{50}V Levels

E(level)[†]	L[†]	C^{2}S′[†‡]	Comments
0	3	2.10	C^{2}S′: 1.9 (1973Sm02). dσ/dΩ=1.82 mb/sr.
226	3	0.76	C^{2}S′: 0.9 (1973Sm02). dσ/dΩ=0.745 mb/sr.
324	3	1.40	C^{2}S′: 1.3 (1973Sm02). dσ/dΩ=1.52 mb/sr.
358	3	0.56	C^{2}S′: 0.7 (1973Sm02). dσ/dΩ=0.498 mb/sr.
393	3	0.39	C^{2}S′: 0.5 (1973Sm02). dσ/dΩ=0.392 mb/sr.
841	3	1.00	C^{2}S′: 1.3 (1973Sm02). dσ/dΩ=1.20 mb/sr.
907	3	2.43	C^{2}S′: 3.1 (1973Sm02). dσ/dΩ=3.23 mb/sr.
1305[@]	3[&]	0.50	C^{2}S′: from 1973Sm02.
1322	3	0.70	C^{2}S′: 0.2 (1973Sm02). dσ/dΩ=0.726 mb/sr.
1522	3	0.05	dσ/dΩ=46.9 μb/sr.
1558[#]	0	0.05	
1715	3	0.04	dσ/dΩ=41.3 μb/sr.
1768	3	0.13	C^{2}S′: 0.2 (1973Sm02). dσ/dΩ=0.130 mb/sr.
1807[#]	3	0.10	dσ/dΩ=90.1 μb/sr.
1938[#]	3	0.20	dσ/dΩ=0.170 mb/sr.
1956	3	0.24	C^{2}S′: 0.6 (1973Sm02). dσ/dΩ=0.210 mb/sr.
1984[#]	3	0.20	dσ/dΩ=0.226 mb/sr.
2040[@]			
2107[@]	3[&]	0.11	C^{2}S′: from 1973Sm02.
2131[#]	1	0.10	dσ/dΩ=0.142 mb/sr.
2162	0	0.1	dσ/dΩ=35.2 μb/sr.
2310	3	0.30	E(level): from 1973Sm02, 2333 from 1975Ma06 deviate from other studies. dσ/dΩ=0.437 mb/sr for 2333 group in 1975Ma06.

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^{51}V(^{3}He,α) 1975Ma06,1973Sm02 (continued)

^{50}V Levels (continued)

E(level)[†]	L[†]	C^2S'[†‡]	Comments
2350[@]			
2388[#]	0	0.06	dσ/dΩ=30.0 μb/sr.
2422[@]			
2460	0	0.51	dσ/dΩ=27.7 μb/sr. L: 3 (1973Sm02).
2484[#]	3	0.03	dσ/dΩ=30.9 μb/sr.
2507[#]	0	0.26	dσ/dΩ=0.101 mb/sr.
2535	2	0.35	L=3, S=0.2 (1973Sm02). dσ/dΩ=0.234 mb/sr.
2605	0	0.10	dσ/dΩ=64.1 μb/sr.
2650	1	0.05	dσ/dΩ=89.2 μb/sr.
2736	2	0.20	L=0, S=0.5 (1973Sm02). dσ/dΩ=0.139 mb/sr.
2761	0	0.10	dσ/dΩ=74.6 μb/sr.
2802	3	0.30	L=0, S=0.9 (1973Sm02). dσ/dΩ=27.0 μb/sr.
2870	0	0.04	C^2S': 0.7 (1973Sm02). dσ/dΩ=17.7 μb/sr.
2893[#]	2	0.40	dσ/dΩ=0.229 mb/sr.
2930[@]	0		C^2S': 0.3 (1973Sm02).
2959[#]	2	0.22	dσ/dΩ=0.117 mb/sr.
2985[@]			
3020	3	0.12	dσ/dΩ=0.111 mb/sr.
3101	2	0.40	C^2S': 0.4 (1973Sm02). dσ/dΩ=0.325 mb/sr.
3135[@]			
3163[#]	0	0.10	dσ/dΩ=72.2 μb/sr.
3208[#]	0	1.30	E(level),L,C^2S': two levels not resolved, E=3219, L=2, C^2S=1.3. dσ/dΩ=1.12 mb/sr.
3307	3	0.40	C^2S': 0.4 (1973Sm02). dσ/dΩ=0.459 mb/sr.
3472[@]	3[&]	0.2	
3520[#]	2	0.23	dσ/dΩ=0.324 mb/sr.
3542[#]	2	0.04	dσ/dΩ=32.3 μb/sr.
3564[#]	2	0.04	C^2S': 0.2 (1973Sm02). dσ/dΩ=29.1 μb/sr.
3608	3	0.20	dσ/dΩ=0.214 mb/sr.
3695	3	0.03	dσ/dΩ=32.2 μb/sr.
3710[#]	3	0.60	dσ/dΩ=0.634 mb/sr.
3755[#]	0	0.11	dσ/dΩ=67.4 μb/sr.
3795[@]	3[&]	0.2	
3820[#]	3	0.30	dσ/dΩ=0.287 mb/sr.
3840[@]			
3890	3	0.05	dσ/dΩ=52.6 μb/sr.
3950[@]			
4040	2	0.09	dσ/dΩ=0.102 mb/sr.
4080	3	0.10	dσ/dΩ=94.7 μb/sr.
4095[@]			
4120	3	0.20	dσ/dΩ=0.165 mb/sr.
4137[@]			

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^{51}V(^{3}He,α) 1975Ma06,1973Sm02 (continued)

^{50}V Levels (continued)

E(level)[†]	L[†]	C^2S'[†‡]	Comments
4240[@]			
4270	1	0.06	dσ/dΩ=0.116 mb/sr.
4340	2	0.07	dσ/dΩ=87.7 μb/sr.
4380	1	0.06	dσ/dΩ=0.118 mb/sr.
4395[@]			
4430	3	0.05	dσ/dΩ=40.3 μb/sr.
4480	2	0.04	dσ/dΩ=46.5 μb/sr. L=3, S=0.2 (1973Sm02).
4500	2	0.16	dσ/dΩ=0.190 mb/sr.
4580	0	0.20	dσ/dΩ=0.162 mb/sr.
4610	1	0.04	dσ/dΩ=0.101 mb/sr.
4670[#]	2	0.09	dσ/dΩ=0.106 mb/sr.
4780	2	0.10	dσ/dΩ=0.161 mb/sr.
4816	3	0.43	dσ/dΩ=0.365 mb/sr.
4880	0	0.09	dσ/dΩ=0.549 mb/sr.
4910	3	0.09	dσ/dΩ=93.6 μb/sr.
5060	1	0.03	dσ/dΩ=0.143 mb/sr.
5100	3	0.06	dσ/dΩ=50.8 μb/sr.
5440	1	0.06	dσ/dΩ=0.166 mb/sr.
5480	3	0.10	dσ/dΩ=76.8 μb/sr.
6391	3	0.20	dσ/dΩ=0.148 mb/sr.
7517	3	0.38	dσ/dΩ=0.214 mb/sr.
8066	3	0.70	dσ/dΩ=0.373 mb/sr.
9273	0	0.30	dσ/dΩ=0.235 mb/sr.

[†] From 1975Ma06, except as noted. Energies consistent with 1973Sm02. L values consistent with 1973Sm02, except as noted. No errors given on E, L and s.

[‡] $C^2S'=[\sigma(\theta)(\text{expt})(2J+1)]/[N(2s+1)\sigma(\theta)(\text{DWBA})]$, where N=23, s=spin and J=total angular momentum of transferred neutron. 1975Ma06 assumed J=7/2 for L=3 and 3/2 for L=1 and 2.

[#] From 1975Ma06 only.

[@] From 1973Sm02 only.

[&] From 1973Sm02.