^{45}Sc(d,t) 1971Oh01

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Jun Chen and Balraj Singh	NDS 190,1 (2023)	20-Jun-2023

Target ^{45}Sc $J^{\pi}=7/2^{-}$.

1971Oh01: E=19.5 MeV deuteron beam was produced from the University of Minnesota tandem Van de Graaff accelerator. Target was a 80 μg/cm^2 carbon-backed metallic foil of ^{45}Sc. Reaction products were momentum analyzed by a split-pole magnetic spectrometer (FWHM=15 keV) and detected by an array of three position-sensitive detector of 700 μg effective thickness. Measured $\sigma(E_t,\theta)$ with θ(c.m.)=10° to 50°. Deduced levels, J, π, L-transfers, spectroscopic factors from DWBA analysis.

1990Be19: E=12 MeV deuteron beam was produced from the Tandem Van de Graaff accelerator of the Nuclear Physics Laboratory, Oxford. Target was natural scandium of nominal thickness 60 μg/cm^2 deposited onto thin carbon backing. Reaction products were momentum analyzed by a multichannel magnetic spectrograph (FWHM≈30 keV) and recorded on Ilford L4 nuclear track plates. Measured $\sigma(E_t,\theta)$ with θ(c.m.)=11.25° to 78.25°. Deduced levels, J, π, L-transfers, spectroscopic factors from DWBA analysis.

Others:

1973Cl11: analysis of data in 1971Oh01.

1985Ko34: E=22.8 MeV. Measured residuals yields.

2000Zh13: E=19-29 MeV. Analyzed isomer ratios.

2011Sk01, 2011Ku10: E=11.7 MeV. Measured reaction products, Eγ, Iγ. Deduced s. Comparison with experimental data.

^{44}Sc Levels

All data from 1971Oh01, unless otherwise noted.

Spectroscopic factor C^2S is defined by $N\times C^2S=(2J+1)\times\sigma(\theta)^{exp}/\sigma(\theta)^{DW}$, where J is the total angular momentum of the transferred particle. N=3.33 in 1990Be19. For quoted values of C^2S, J=7/2 is assumed for L=3 and J=3/2 is assumed for L=1 and 2 (1971Oh01,1990Be19).

E(level)	L	C^2S[†]	Comments
0	3	0.35	C^2S: other: 0.36 (1990Be19).
271 *5*	3	0.48	C^2S: other: 0.62 (1990Be19).
353 *5*	1+3	0.03,0.35	C^2S: other: 0.40 for L=3 (1990Be19).
427 *8*	2	0.06	C^2S: other: 0.08 (1990Be19).
632 *5*	2	0.13	C^2S: other: 0.21 (1990Be19).
669 *5*	3	0.32	C^2S: other: 0.30 (1990Be19).
765 *5*	3	0.20	C^2S: other: 0.23 (1990Be19).
971 *4*	3	1.3	C^2S: other: 1.35 (1990Be19).
1012 *10*	(0)	0.02	
1056 *5*	1+3	0.04,0.25	C^2S: other: 0.28 for L=3 (1990Be19).
1187 *7*	1+3	0.03,0.26	C^2S: other: 0.34 for L=3 (1990Be19).
1415 *10*	2	0.41	C^2S: other: 0.34 (1990Be19).
1534 *5*	1+3	0.04,0.15	C^2S: other: 0.17 for L=3 (1990Be19).
1560 *5*	0+2	0.05,0.12	
1654 *10*	0	0.01	
1688 *6*	2	0.41	
1768 *10*	2	0.06	
1986 *5*	0	0.05	
2038 *8*	0+2	0.02,0.05	
2108 *5*	2	0.38	
2186 *10*	2	0.05	
2213 *5*	0+2	0.07,0.17	
2243 *10*	2	0.04	
2333 *10*	2	0.08	
2492 *5*	0	0.12	
2526 *10*	2	0.12	

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^{45}Sc(d,t) 1971Oh01 (continued)

^{44}Sc Levels (continued)

E(level)	L	C^2S[†]	E(level)	L	C^2S[†]	E(level)
2586 *5*	0	0.14	2784 *10*	3	0.22[‡]	3183 *15*
2622 *8*	0+2	0.04,0.10	2912 *10*	1+3	0.01,0.30	3206 *10*
2643 *10*			2989 *10*	0+2	0.02,0.07	
2751 *10*	0+2	0.05,0.10	3011 *10*	0+2	0.15,0.15	

[†] 1978En02 give S values for selected well-resolved levels.
[‡] S=1.1 (1978En02) calculated for T=2.