^{45}Sc(^{3}He,α) 1971Ra09

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^{π}=7/2^{-}.

1971Ra09: E=13 MeV ^{3}He beam was produced from the MIT cyclotron. Target was made by vacuum evaporation of 52 μg/cm^{2} metallic scandium onto a thin carbon backing. Reaction products were momentum analyzed by the MIT multiple-gap spectrograph (FWHM=30 keV). Measured $\sigma(E_{\alpha},\theta)$, θ(lab)=7.5° to 172.5°. Deduced levels, J, π, L, spectroscopic factors from DWBA analysis.

Others:

1970Ri04: E=6-19 MeV ^{3}He beam produced from the Florida State University Tandem Van de Graaff accelerator. Targets of scandium metal (99.9% purity) evaporated onto aluminum backings. NaI(Tl) scintillator for detecting γ-rays. Measured σ(E(^{3}He)). Deduced isomer ratio, spin cutoff parameter.

1985Ko34: E=32.1 MeV. Measured residuals yields.

2007La23: E=30,38 MeV. Measured Eγ, Eα, E(^{3}He), (particle)γ-coin. Deduced level densities and giant resonance strength functions.

2007La31: E=38 MeV. Measured Eγ, Iγ. Deduced level densities, γ-strength functions.

2008Vo02: E=11 MeV. Measured Eγ, Iγ, $\alpha(\theta)$. Deduced level densities.

^{44}Sc Levels

Spectroscopic factor C^{2}S: N×C^{2}S=$\sigma(\theta)^{exp}/\sigma(\theta)^{DWBA}$, where N is the normalization factor. N=25 *5* in 1971Ra09.

dσ/dΩ under comments are maximum observed cross section at θ(lab)=7.5° in 1971Ra09, unless otherwise noted.

E(level)†	L‡	C^{2}S‡	Comments
0	3	0.35	dσ/dΩ=0.22 mb/sr.
269 *20*	3	0.50	dσ/dΩ=0.35 mb/sr.
344 *20*	3	0.37	dσ/dΩ=0.28 mb/sr.
654 *20*	3	0.32	dσ/dΩ=0.26 mb/sr.
756 *20*	3	0.14	dσ/dΩ=0.11 mb/sr.
976 *20*	3	1.37	dσ/dΩ=1.09 mb/sr.
1043 *20*	3	0.23	dσ/dΩ=0.18 mb/sr.
1181 *20*	3	0.23	dσ/dΩ=0.20 mb/sr.
1424 *20*	(2)	0.20	dσ/dΩ=0.08 mb/sr.
1531 *20*	(3)	0.25	dσ/dΩ=0.24 mb/sr.
1682 *20*	2	0.32	dσ/dΩ=0.18 mb/sr.
2110 *20*	(2,3)	0.30,0.15	dσ/dΩ=0.17 mb/sr.
2210 *20*	(2)	0.19	dσ/dΩ=0.10 mb/sr.
2584 *20*	(0)	0.12	dσ/dΩ=0.03 mb/sr at θ(lab)=30°.
2696 *20*			dσ/dΩ=0.01 mb/sr at θ(lab)=22.5°.
2763# *20*	3	0.10@	dσ/dΩ=0.15 mb/sr at θ(lab)=22.5°.
2907 *20*			dσ/dΩ=0.06 mb/sr.
3004 *20*	(2)	0.20	dσ/dΩ=0.14 mb/sr.

† From 1971Ra09.

‡ From DWBA analysis of measured $\sigma(\theta)$ in 1971Ra09. 1978En02 give S factors for selected well-resolved levels adjusted upwards by ≈9%, based on standard normalization factors in DWBA analysis (see 1977En02).

Analog of ^{44}Ca g.s. T=2.

@ S=0.50 (1978En02).