^{46}Ti(p,α),(pol p,α) 1982Ab03,1981Bo37,1965Pl01

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen[#]	NDS 126, 1 (2015)	31-Mar-2015

1982Ab03: (p,α) E=40.35 MeV proton beam was produced from the University of Manitoba sector-focused cyclotron. Target of 81.2% enriched Ti metal. α particles were detected by 6 counter telescopes of ΔE-E silicon surface barrier detectors, FWHM=70-80 keV. Measured $\sigma(E_\alpha,\theta)$. Deduced levels, J, π from DWBA analysis.

1981Bo37: (pol p,α) E=79.2 MeV polarized proton beam was produced from the Indiana University Cyclotron Facility (IUCF). Target of self-supporting enriched Ti foils. α particles were momentum analyzed with the IUCF QDDM magnetic spectrograph and detected in the 1 m long focal plane detector, FWHM=80-100 keV. Measured $\sigma(\alpha,\theta)$ and $A_y(\theta)$. Deduced levels, J, π from DWBA calculations.

1965Pl01: (p,α) E=10 MeV proton beam was produced from the Florida State University Tandem Van de Graaff accelerator. Target of TiO_2 on a carbon backing. α particles were momentum analyzed with a broad range magnetic spectrograph and detected on 50 μm thick Kodak-NTA emulsions. Measured $\sigma(E_\alpha,\theta)$. Deduced levels.

1971NoZX: (p,α) E=30 MeV. Measured $\sigma(\theta)$.

^{43}Sc Levels

σ(theory)=N×σ(DWBA), where N=47.2×10^6 to give 1.0 for g.s.

E(level)[†]	J$^\pi$	Relative cluster factors[b]	Comments
0	7/2$^-$[&][a]	1.2	σ(exp)/σ(theory)=1.0.
151 *3*	3/2$^+$[a]		σ(exp)/σ(theory)=0.75.
479 *5*			
840[‡]	5/2$^-$[&]		
856 *8*	1/2$^+$[a]		σ(exp)/σ(theory)=2.5.
884 *8*			
1188 *8*			
1400	7/2$^-$[a]		σ(exp)/σ(theory)=0.1.
1640[‡]	5/2$^+$[&]		
1830	11/2$^-$[&][a]	0.27	σ(exp)/σ(theory)=1.8.
2130[@]			
2250[@]			
2650[@]			
2870	(5/2$^+$,9/2$^+$)[#]		J$^\pi$: $\sigma(\theta)$ (1982Ab03) fits 7/2$^+$. σ(exp)/σ(theory)=5.5.
2990	15/2$^-$[&]	0.67	σ(exp)/σ(theory)=1.2.
3120	19/2$^-$[&]	1.0	σ(exp)/σ(theory)=0.5.
3470[@]			
3810[@]			
4180[‡]	(9/2$^+$,13/2$^+$)[#]		
4230	7/2$^-$[a]		σ(exp)/σ(theory)=1.1.
4360[‡]	17/2$^-$	≤0.11	J$^\pi$: poor fit of $\sigma(\theta)$ and Ay(θ) data in (pol p,α) to 17/2$^-$ due probably to contribution from other levels in the vicinity or to complex reaction mechanism.
4550?[‡]	(11/2$^+$,13/2$^-$)[#]	0.34	
4700[‡]	(15/2$^+$)[#]		
5200[‡]	17/2$^+$[#]		
5230	3/2$^+$[a]		
6220	1/2$^+$[a]		

Continued on next page (footnotes at end of table)

^{46}Ti(p,α),(pol p,α) 1982Ab03,1981Bo37,1965Pl01 (continued)

^{43}Sc Levels (continued)

† From 1965Pl01 for levels below 1200. Above this energy, values are from 1982Ab03, unless otherwise indicated.
‡ From 1981Bo37.
# From Ay(θ) in (pol p,α).
@ From spectrum figure of 1982Ab03.
& $\sigma(\theta)$ and Ay(θ) data in (pol p,α) are consistent with the assigned J^{π}.
a From comparison of $\sigma(\theta)$ with DWBA calculations (1982Ab03).
b From 1981Bo37, normalized to 1.0 for $19/2^-$, 3120 state.