

⁴⁶Ti(pol d,α),(d,α) 1986Ba47,1972Gu10

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

Target ⁴⁶Ti $J^\pi=0^+$.

1986Ba47: (pol d,α), E=7 to 9.75 MeV polarized deuteron beam was produced from the McMaster Lamb-shift polarized ion source and accelerated through an FN tandem accelerator. Reaction products were momentum analyzed by an Enge split-pole magnetic spectrometer (FWHM=12 keV) and detected by a position sensitive proportional counter. Deuterons $\sigma(E_\alpha)$, analyzing powers. Deduced levels, J, π .

1972Gu10: (d,α), E=26.7 MeV deuteron beam was produced from the cyclotron of the Institute of Nuclear Sciences at Grenoble. Target was 50 $\mu\text{g}/\text{cm}^2$ ⁴⁶Ti (81.2% enriched) deposited onto a 130 $\mu\text{g}/\text{cm}^2$ carbon backing. Reaction products were momentum analyzed (FWHM=60 keV). Measured $\sigma(E_\alpha, \theta)$ with $\theta(\text{c.m.}) \approx 20^\circ$ to $\approx 50^\circ$. Deduced levels, J, π , L-transfers from DWBA analysis.

1964Bj01: (d,α), E=3.0-4.3 MeV deuteron beams were produced from an electrostatic generator. Targets were 99.% enriched ⁴⁶Ti with a thickness from $\approx 5 \mu\text{g}/\text{cm}^2$ to $\approx 30 \mu\text{g}/\text{cm}^2$ on $\approx 50 \mu\text{g}/\text{cm}^2$ carbon backings. Reaction products were momentum analyzed with a 90° deflecting magnet ($\approx 0.4\%$ energy resolution). Measured $\sigma(E_\alpha)$. Deduced levels.

Others:

1960An15, 1964Ch29: measured total σ .

⁴⁴Sc Levels

E(level) [‡]	J^π [†]	L^b	Comments
0	2+ [@]		
68 6	1- [@]		E(level): other: 68 12 (1964Bj01).
146 6	0-		E(level): other: 141 12 (1964Bj01).
235 6	2- ^{&}		E(level): other: 239 12 (1964Bj01).
350 6	4+ ^a		E(level): other: 357 12 (1964Bj01).
426 [#] 12			
533 [#] 12			
631 6	4- ^{&}	0+2	E(level): others: 633 12 (1964Bj01), 650 30 (1972Gu10). L: from 1972Gu10 for a group at 650 30, which could be a doublet of 631+667.
667 6	1+ ^{&}	0+2	E(level): others: 670 12 (1964Bj01), 650 (1972Gu10). L: see comment for 631 level.
763 6	3+ ^{&}	2	E(level): others: 764 12 (1964Bj01), 750 30 (1972Gu10).
829 [#] 12			
968 6	^{&}	6	E(level): other: 950 30 (1972Gu10).
987 6	3+ ^{&}		E(level): other: 994 12 (1964Bj01).
1050 6	^{&}	4	E(level): other: 1040 30 (1972Gu10).
1142 6	^{&}	(2)	E(level): others: 1144 12 (1964Bj01), 1150 30 (1972Gu10).
1186 6	^{&}		E(level): other: 1192 12 (1964Bj01) could correspond to 1186+1197.
1197 6	[@]		
1277 [#] 12			
1326 6	^{&}		E(level): other: 1346 12 (1964Bj01).
1427 6	^a		E(level): other: 1427 12 (1964Bj01).
1532 6	^{&}	1	E(level): other: 1520 30 (1972Gu10).
1567 6	^a		
1681 6	^{&}	(1,3)	E(level): other: 1680 30 (1972Gu10).
1768 6	^{&}	(2,3)	E(level): other: 1790 30 (1972Gu10).
1811 6	^{&}		
1866 6	^{&}		

Continued on next page (footnotes at end of table)

$^{46}\text{Ti}(\text{pol } d,\alpha), (d,\alpha)$ 1986Ba47, 1972Gu10 (continued) ^{44}Sc Levels (continued)

<u>E(level)[‡]</u>	<u>J^π[†]</u>	<u>L^b</u>	<u>Comments</u>
1957 6	<i>a</i>		
2031 6	&		
2104 6	&	5	E(level): other: 2070 30 (1972Gu10).
2115 6	&		
2179 6	@		
2213 6	&		
2241 6	@		
2333 6	<i>a</i>		
2383 6	&		
2492 6	&		

[†] Natural or unnatural parity assigned from measurement of analyzing powers (1986Ba47).

[‡] From 1986Ba47, unless otherwise noted. No uncertainty is reported in 1986Ba47 and the evaluators have assigned 6 keV based on the energy resolution of 12 keV and also the fact that an uncertainty of 30 keV is assigned in 1972Gu10 with a resolution of 60 keV.

From 1964Bj01 only.

@ Natural parity state from analyzing power (1986Ba47).

& Unnatural parity state from analyzing power (1986Ba47).

a Probable natural parity state from analyzing power (1986Ba47).

b From DWBA analysis of measured $\sigma(\theta)$ in 1972Gu10.