## $^{40}\text{Ca}(\alpha,\text{n}\gamma)$    **1978Me15**

### History

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

1978Me15, 1978Me09: E=20 MeV $\alpha$ beam was produced at the Argonne National Laboratory. Target of an enriched (>99.9%) $^{40}$Ca with thickness of about 1 mg/cm$^2$, evaporated onto a 0.127 mm thick Pb foil. Neutrons and $\gamma$-rays were separated by pulse-shape discrimination using a 5-cm diam by 2.5-cm thick stilbene crystal. $\gamma$-rays were detected with a 70-cm$^3$ Ge(Li) detector. Measured E$\gamma$, I$\gamma$, $\gamma$(t), n$\gamma$(t), $\gamma\gamma$(t). Deduced levels, T$_{1/2}$.

1978Ha07: E=21 MeV $\alpha$ beam was produced from the Chalk River MP tandem accelerator. Targets of $\approx$10 mg/cm$^2$ $^{40}$Ca. Delayed $\gamma$-rays were detected with Ge(Li) detectors. Measured $\gamma(\theta,H,t)$. Deduced g factors, T$_{1/2}$.

1981Da06: E=21 MeV $\alpha$ beam was produced from the Stony Brook FN tandem. Target of a 400 $\mu$g/cm$^2$ Ca. $\gamma$-rays were detected with both NaI and Ge(Li) detectors. Measured $\gamma\gamma(\theta,H,t)$. Deduced levels, T$_{1/2}$, quadrupole moments.

Others: 1976Fi08.

All data are from 1978Me15 and 1978Me09 unless otherwise noted.

### $^{43}$Ti Levels

| E(level) | J$^{\pi\dagger}$ | T$_{1/2}$ | Comments |
|---|---|---|---|
| 0.0 | 7/2$^-$ | | J$^\pi$: from Adopted Levels. |
| 313.0 $10$ | (3/2$^+$) | 12.6 $\mu$s $6$ | T$_{1/2}$: from $\gamma$(t) in 1978Me15. |
| 999? | (1/2$^+$) | | |
| 1022.4 $10$ | (5/2$^+$) | | |
| 1483.5 $10$ | (7/2$^+$) | | |
| 1857.7 $10$ | (11/2$^-$) | | |
| 2062.4 $10$ | (9/2$^+$) | | |
| 2951.7 $10$ | (15/2$^-$) | | |
| 3066.4 $10$ | (19/2$^-$) | 560 ns $6$ | $\mu$=+7.22 $1$ (1978Ha07); Q=0.30 $7$ (1981Da06) |
| | | | $\mu$,Q: DPAD method. |
| | | | T$_{1/2}$: from $\gamma$(t) (1978Ha07). 553 ns $21$ from 1981Da06. |

$^\dagger$ From analogy with mirror nucleus $^{43}$Sc.

### $\gamma(^{43}\text{Ti})$

| E$_\gamma$ | E$_i$(level) | J$_i^\pi$ | E$_f$ | J$_f^\pi$ | Mult. |
|---|---|---|---|---|---|
| 114.7 | 3066.4 | (19/2$^-$) | 2951.7 | (15/2$^-$) | [E2] |
| 313.0 | 313.0 | (3/2$^+$) | 0.0 | 7/2$^-$ | |
| 686$^\dagger$ | 999? | (1/2$^+$) | 313.0 | (3/2$^+$) | |
| 709.4 | 1022.4 | (5/2$^+$) | 313.0 | (3/2$^+$) | |
| 1040.0 | 2062.4 | (9/2$^+$) | 1022.4 | (5/2$^+$) | |
| 1094.0 | 2951.7 | (15/2$^-$) | 1857.7 | (11/2$^-$) | |
| 1170.5 | 1483.5 | (7/2$^+$) | 313.0 | (3/2$^+$) | |
| 1857.7 | 1857.7 | (11/2$^-$) | 0.0 | 7/2$^-$ | |

$^\dagger$ Placement of transition in the level scheme is uncertain.

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Legend

<u>Level Scheme</u>

- - - - - - ► γ Decay (Uncertain)



${}^{43}_{22}\text{Ti}_{21}$