

Adopted Levels, Gammas

| Type | Author | History | Citation | Literature Cutoff Date |
|-----------------|--|---------|-------------------|------------------------|
| Full Evaluation | Jun Chen [#] and Balraj Singh | | NDS 135, 1 (2016) | 31-May-2016 |

$Q(\beta^-) = -17490$ SY; S(n)=17478 28; S(p)=3751.22 27; $Q(\alpha) = -5471.1$ 3 [2012Wa38](#)

Estimated uncertainty for $Q(\beta^-) = 300$ (syst, [2012Wa38](#)).

S(2n)=32400 160, S(2p)=4836.20 28, $Q(\epsilon p) = 2744.25$ 24 ([2012Wa38](#)).

Identification and production of ^{42}Ti nuclide by [1962Ob03](#) using $^{40}\text{Ca}(^3\text{He}, n)$ which measured a half-life of 0.25 s 4.

[2009Ku19](#): ^{42}Ti produced in $^{40}\text{Ca}(^3\text{He}, n\gamma)$ E=17 MeV, beam from the Ion Guide Isotope Separator On-Line (IGISOL) facility at the Accelerator Laboratory of the University of Jyväskylä. Target of a 1.5 mg/cm² natural Ca. Measured $E\gamma$, $\beta\gamma$ -coin, $T_{1/2}$, mass differences using JYFLTRAP Penning-trap spectrometer.

 ^{42}Ti LevelsCross Reference (XREF) Flags

| | | | |
|---|--|---|---|
| A | ^{43}Cr ϵp decay (21.2 ms) | D | $^{40}\text{Ca}(^3\text{He}, n\gamma)$ |
| B | ^{45}Fe $\epsilon 3p$ decay (2.45 ms) | E | $^{40}\text{Ca}(^{12}\text{C}, ^{10}\text{Be})$ |
| C | $^{40}\text{Ca}(^3\text{He}, n)$ | F | $^{42}\text{Ca}(\pi^+, \pi^-)$ |

| E(level) [†] | J^π | $T_{1/2}$ [#] | XREF | Comments |
|------------------------|-------------------|------------------------|--------|---|
| 0 | 0 ⁺ | 208.65 ms 80 | ABCD F | $\% \epsilon + \% \beta^+ = 100$ $T_{1/2}$: weighted average of 211.7 ms 19 (2015Mo01 , from analysis of β -decay and correlated implantations), 209.5 ms 52 (2015Mo01 , from the analysis of γ -ray data), 208.14 ms 45 (2009Ku19 , also 2011KuZY , from decay timing of positrons emitted by a pure ^{42}Ti source deposited on a mylar tape and counted by a 4π cylindrical plastic scintillator, source production used Penning-trap system; uncertainty increased by evaluators by a factor of 2), 230 ms 50 (1972Zi02 , β counting), 202 ms 5 (1969Ga27 , γ counting), and 200 ms 20 (1969Ni03 , γ counting), 250 ms 40 (1962Ob03). Other: 173 ms 14 (1969Al12 , β counting) seems discrepant as compared to all the other values. 2015Ha07 review gives $T_{1/2} = 208.09$ ms 55. |
| 1554.6 [‡] 3 | 2 ⁺ | 0.44 ps 11 | A CD F | J^π : L($^3\text{He}, n$)=2. |
| 1854.2 12 | 0 ⁺ | >0.14 ps | CD | J^π : L($^3\text{He}, n$)=0. |
| 2396.1 [‡] 10 | (2 ⁺) | 0.22 ps 13 | A CD | J^π : γ to 0 ⁺ ; RUL; systematics. |
| 2676.6 8 | 4 ⁺ | >1.4 ps | CD | J^π : L($^3\text{He}, n$)=4. |
| 2730? 35 | | | C | |
| 2945? 25 | | | C | |
| 3043.0 15 | 6 ⁺ | 3.12 ns 21 | CDE | J^π : L($^3\text{He}, n$)=6. |
| 3130? 45 | | | C | |
| 3280 40 | | | C | |
| 3335? | | | D | |
| 3440 30 | 1 ⁻ | | C | J^π : L($^3\text{He}, n$)=1. |
| 3540 30 | | | C | |
| 3660 25 | | | C | |
| 3744 3 | 2 ⁺ | <0.17 ps | CD | J^π : L($^3\text{He}, n$)=2. |
| 3850 25 | | | C | |
| 3990 25 | | | C | |
| 4130 25 | | | C | |
| 4245 25 | 0 ⁺ | | C | J^π : L($^3\text{He}, n$)=0. |
| 4375 20 | 3 ⁻ | | C | J^π : L($^3\text{He}, n$)=3. |
| 4.40×10^3 20 | | | E | |
| 4440 20 | 2 ⁺ | | C | J^π : L($^3\text{He}, n$)=2. |
| 4665 20 | 2 ⁺ | | C | J^π : L($^3\text{He}, n$)=2. |
| 4730 30 | | | C | |

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued) ^{42}Ti Levels (continued)

| E(level) [†] | J ^π | XREF | Comments |
|-------------------------|-------------------|------|---|
| 4890? 45 | | C | |
| 4950 25 | 4 ⁺ | C | J ^π : L(³ He,n)=4. |
| 5160? 50 | | C | |
| 5220 30 | 4 ⁺ | C | J ^π : L(³ He,n)=4. |
| 5555 20 | 0 ⁺ | C | J ^π : L(³ He,n)=0. |
| 6370 30 | (0 ⁺) | C | J ^π : L(³ He,n)=(0). |
| 6445 40 | | C | |
| 7.50×10 ³ 20 | | E | |

[†] From (³He,n γ) and (³He,n).

[‡] From E γ in ⁴³Cr ϵ cp decay.

From DSAM in (³He,n γ), unless otherwise noted.

 $\gamma(^{42}\text{Ti})$

| E _i (level) | J _i ^π | E _{γ} [†] | I _{γ} [#] | E _f | J _f ^π | Mult. | Comments |
|------------------------|-----------------------------|---|---|----------------|-----------------------------|-------|--------------------|
| 1554.6 | 2 ⁺ | 1554.6 [‡] 3 | 100 | 0 | 0 ⁺ | (E2) | B(E2)(W.u.)=16 4 |
| 1854.2 | 0 ⁺ | 298.2 | 100 | 1554.6 | 2 ⁺ | [E2] | |
| 2396.1 | (2 ⁺) | 838.4 [‡] 10 | 100 | 1554.6 | 2 ⁺ | [M1] | B(M1)(W.u.)=0.13 8 |
| | | 2396.0 | 28 10 | 0 | 0 ⁺ | [E2] | B(E2)(W.u.)=0.8 6 |
| 2676.6 | 4 ⁺ | 1120.6 | 100 | 1554.6 | 2 ⁺ | [E2] | |
| 3043.0 | 6 ⁺ | 366.4 | 100 | 2676.6 | 4 ⁺ | [E2] | B(E2)(W.u.)=3.2 2 |
| 3335? | | 1779 | | 1554.6 | 2 ⁺ | | |
| 3744 | 2 ⁺ | 2188 | 100 9 | 1554.6 | 2 ⁺ | [M1] | |
| | | 3744 | 40 9 | 0 | 0 ⁺ | [E2] | |

[†] From level-energy differences, recoil correction removed, unless otherwise noted.

[‡] From ⁴³Cr ϵ cp decay.

From (³He,n γ).

Adopted Levels, GammasLevel Scheme

Intensities: Relative photon branching from each level

