^{40}Ca(^{3}He,nγ) 1973Co38,1973Ha10

History

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

1973Co38: E=8.0 MeV beam was produced at the Oxford University tandem Van de Graaff accelerator. Target of about 1 mg/cm^2 natural Ca metal (99.7% purity) evaporated onto a 10 mg/cm^2 gold foil. Neutrons were detected by the Oxford high efficiency neutron detector and γ-rays were detected by a true coaxial Ge(Li) detector Measured σ(E$_n$), Eγ. Deduced levels, T$_{1/2}$ by DSAM.

1973Ha10: E=10.0-11.5 MeV. Targets of 200-300 μg/cm^2 natural calcium evaporated on Ta backings. Neutrons were detected in a 5.1-cm-diam by 7.6-cm-long liquid scintillator and γ-rays were detected by a 55 cm^3 Ge(Li) detector (FWHM=4.5 keV at 1.28 MeV). Measured nγ, n$\gamma\gamma$-coin. Deduced levels, T$_{1/2}$ by DSAM.

1977Br20 (1971BrYK), 1975Ku17: E=10, 12 MeV. Measured T$_{1/2}$ by γ(t).

1971Bo23: E=9-10 MeV. Measured Eγ, $\gamma\gamma$-coin, T$_{1/2}$ by DSAM.

1971FoZV: E=6, 6.5, 10 MeV. Measured nγ-coin, p$\gamma(\theta)$, T$_{1/2}$ by DSAM.

1969Ni03: E=8.0-9.0 MeV. Measured Eγ, $\gamma(\theta)$, T$_{1/2}$.

^{42}Ti Levels

E(level)[‡]	J$^\pi$[#]	T$_{1/2}$[†]	Comments
0	0$^+$		
1556.0 *5*	2$^+$	0.44 ps *11*	T$_{1/2}$: from mean lifetime τ=0.63 ps *16* as weighted average of τ=0.56 ps *16* (1973Ha10), 0.75 ps *30* (1973Co38), 0.53 ps *24* (1971BrYK), 0.49 ps *21* (1971FoZV), 1.7 ps *4* (1971Bo23). 2001Ra27 evaluation gives τ=0.56 ps *15*.
1854.2 *12*	0$^+$	>0.14 ps	T$_{1/2}$: from 1973Co38.
2396.1 *12*	(2$^+$)	0.22 ps *13*	T$_{1/2}$: weighted average of 0.31 ps *18* (1973Ha10), 0.35 ps *25* (1973Co38).
2676.6 *8*	4$^+$	>1.4 ps	T$_{1/2}$: from 1973Co38. Other: >1.1 ps (1973Ha10).
3043.0 *15*	6$^+$	3.12 ns *21*	T$_{1/2}$: from $\gamma\gamma$(t) (1977Br20). Others: 3.5 ns *14* (1975Ku17), 18 ns *4* (1973Co38).
3335?			E(level),J$^\pi$: level and J$^\pi$=(1,2) are considered as uncertain since It is reported by 1973Ha10 only.
3744 *3*	2$^+$	<0.17 ps	J$^\pi$: 1973Co38 proposed 6$^+$. T$_{1/2}$: from 1973Co38.

[†] From DSAM, unless otherwise stated.
[‡] From 1973Co38, except where noted.
[#] From Adopted Levels.

γ(^{42}Ti)

E$_i$(level)	J$_i^\pi$	E$_\gamma$[†#]	I$_\gamma$	E$_f$	J$_f^\pi$
1556.0	2$^+$	1556.0		0	0$^+$
1854.2	0$^+$	298.2		1556.0	2$^+$
2396.1	(2$^+$)	840.1	100	1556.0	2$^+$
		2396.0	28[‡] *10*	0	0$^+$
2676.6	4$^+$	1120.6		1556.0	2$^+$
3043.0	6$^+$	366.4		2676.6	4$^+$
3335?		1779		1556.0	2$^+$
3744	2$^+$	2188	100 *9*	1556.0	2$^+$
		3744	40[#] *9*	0	0$^+$

[†] From level-energy differences.
[‡] Average of 37 (1973Co38) and 18 (1973Co38).
[#] From 1973Ha10.

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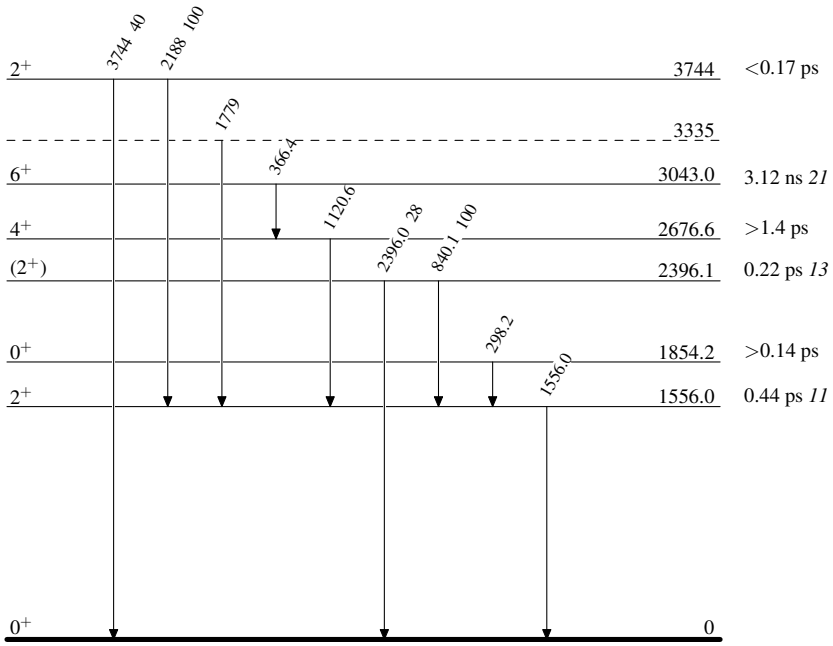
Level Scheme

Intensities: Relative photon branching from each level



$^{42}_{22}Ti_{20}$