^{42}Sc ε decay (680.79 ms) 1985Da04,1997Ko65,1976Wi08

History

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

Parent: ^{42}Sc: E=0; $J^\pi=0^+$; $T_{1/2}$=680.79 ms *28*; Q(ε)=6426.10 *10*; %ε+%β^+ decay=100.0

^{42}Sc-J^π,$T_{1/2}$: From Adopted Levels of ^{42}Sc. 2015Ha07 review gives $T_{1/2}$=680.72 ms *26*.

^{42}Sc-Q(ε): From 2012Wa38. 2015Ha07 review gives 6426.28 *30*.

^{42}Sc decays mainly (>99%) through β^+ decay.

γ: 1985Da04, 1980Sa32, 1977In04, 1971Ke14, 1971Ga17, 1957Cl40.

β^+: 1961Ja22, 1957Cl40, 1955Mo83.

$\beta\gamma(\theta)$: 1974HaYC, 1973KeZI.

$T_{1/2}$(^{42}Sc g.s.): 1997Ko65, 1976Wi08 (also 1972Ha82), 1965Fr08, 1965Ne02, 1962Ja05, 1961Ja22, 1960Ja12, 1957Cl40, 1955Mo83.

Other: 2010StZY: deduced GT strength distributions for β-decay.

2015Ha07: review of superallowed decays; evaluated Q value, $T_{1/2}$ branching ratios, *ft* value, isospin-symmetry-breaking corrections.

^{42}Ca Levels

E(level)[†]	J^π[†]
0	0^+
1525	2^+
1837	0^+

[†] From Adopted Levels, energies are rounded values.

ε,β^+ radiations

E(decay)	E(level)	Iβ^+ [†]	Iε[†]	Log *ft*	I($\varepsilon+\beta^+$)[†]	Comments
(4589.10 *10*)	1837	0.0074 *11*	2.5×10^{-5} *4*	6.79 *7*	0.0074 *11*	av Eβ=1616.83; εK=0.002989; εL=0.0002959; εM+=4.971×10^{-5}
(6426.10 *10*)	0	99.8953 *15*	0.0972 *10*	3.4845 *2*	99.9925 *11*	av Eβ=2510.34; εK=0.0008713; εL=8.620×10^{-5}; εM+=1.448×10^{-5} E(decay): measured E(β^+)=4.8×10^3 *9* (1957Cl40). 0^+ to 0^+ superallowed β transition. I($\varepsilon+\beta^+$): 2015Ha07 review gives 99.9941 *14*.

[†] Absolute intensity per 100 decays.

γ(^{42}Ca)

E_γ	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	α[‡]	Comments
313	0.0075 *12*	1837	0^+	1525	2^+	0.00349	I_γ: assumed the same as for 1524.7γ.
1524	0.0075 *12*	1525	2^+	0	0^+		I_γ: weighted average of 0.0070 *12* (1985Da04), 0.0103 *31* (1980Sa32), 0.0079 *20* (1977In04). Others: 0.0022 *17* (1978De08, same laboratory as 1985Da04), 1971Ke14.

[†] Absolute intensity per 100 decays.

[‡] Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

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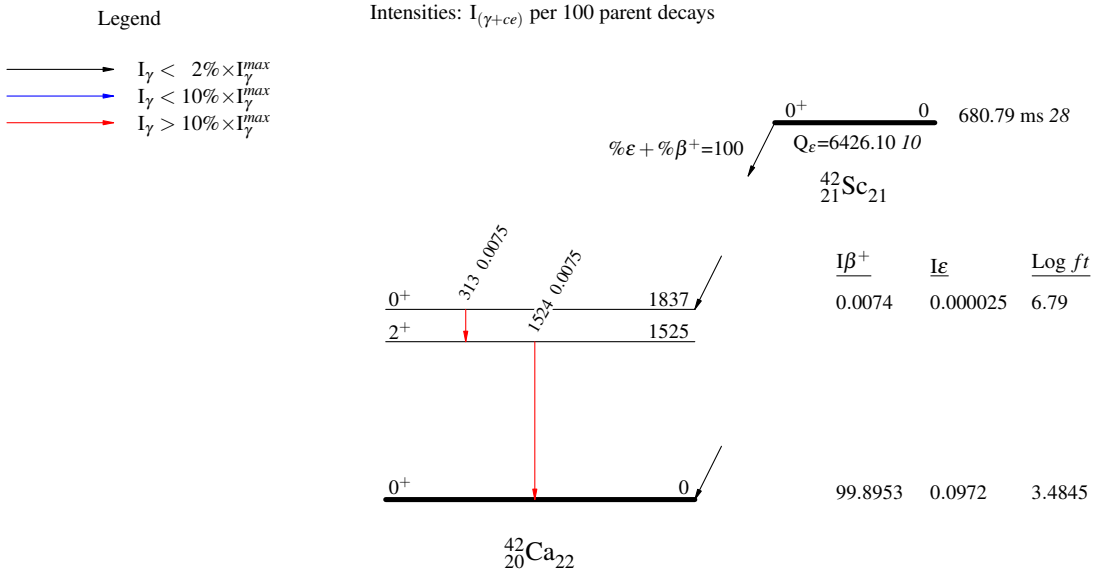
Decay Scheme

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays



	Iβ+	Iε	Log *ft*
	0.0074	0.000025	6.79
	99.8953	0.0972	3.4845