^{54}Ca β^- decay:107 ms 2008Ma01,2010Cr02

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Yang Dong, Huo Junde	NDS 121, 1 (2014)	20-Jun-2014

Parent: ^{54}Ca: E=0.0; $J^\pi=0^+$; $T_{1/2}$=107 ms *14*; Q(β^-)=8820 *SY*; %β^- decay=100.0

^{54}Ca-Dqp: SY=620 (syst, 2012WA38).

2008Ma01: The ^{54}Ca isotope formed by bombarding a ^{9}Be target by E=140 MeV/nucleon ^{76}Ge beam, A 1900 fragment separator. TOF technique. Measured β particles using Beta Counting System of three Si PIN detectors, a double-sided silicon strip detector and six single sided silicon strip detectors. Detected γ rays using 16 Ge detectors of the Segmented Germanium array. Measured half-life of ^{54}Ca by fitting the decay curves to a function which included decay of the parent, growth and decay of daughter and a constant background. A 247-keV gamma ray was seen in correlation with β rays and assigned to the decay of ^{54}Ca.

2010Cr02: Same authors as 2008Ma01, source from ^{9}Be(^{76}Ge,Xγ) E=130 MeV/nucleon, tof technique, measured β particles using nscl Beta Counting System of three Si pin detectors, a double-sided silicon strip detector and six single sided silicon strip detectors. Detected prompt and delayed γ rays in coin with fragments using 16 Ge detectors of the Segmented Germanium array. Measured half-life of ^{54}Ca by fitting the decay curves of (^{54}Ca)β(247γ) correlated events.

Decay scheme for ^{54}Ca is from 2008Ma01.

^{54}Sc Levels

E(level)	J^π
0.0	$(3)^+$
247	1^+

β^- radiations

E(decay)	E(level)	Iβ^-[†]	Log *ft*	Comments
(8573 *SY*)	247	83 *17*	4.25 *20*	Iβ^-: other: 97 *+3−32* (2008Ma01).
(8820[‡] *SY*)	0.0	<32	>4.8	Iβ^-: this β branch (involving ΔJ=3) is highly unlikely if $J^\pi=3^+$ for ^{54}Sc g.s..

[†] Absolute intensity per 100 decays.

[‡] Existence of this branch is questionable.

γ(^{54}Sc)

E$_\gamma$	I$_\gamma$[†]	E$_i$(level)	J^π_i	E$_f$	J^π_f	Mult.	Comments
247.2 *2*	100	247	1^+	0.0	$(3)^+$	[E2]	E$_\gamma$: From weighted average values of 246.9 *4* (2008Ma01) and 247.3 *3* (2010Cr02). I$_\gamma$: absolute intensity: 65 *9* (2010Cr02). Other: 97 *32* (2008Ma01),

[†] Absolute intensity per 100 decays.

^{54}Ca β^- decay:107 ms 2008Ma01,2010Cr02

Decay Scheme

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