^{50}K IT decay (131 ns) 2009Cr03,2010Da06,2012Ka36

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Jun Chen and Balraj Singh	NDS 157, 1 (2019)	15-Apr-2019

Parent: ^{50}K: E=172.0 *4*; $J^\pi=(2^-)$; $T_{1/2}$=131 ns *40*; %IT decay=100.0

^{50}K-%IT decay: Assumed 100% IT decay.

2010Da06, 1999DaZQ: Ni(^{86}Kr,X) E=60.3 MeV/nucleon. Measured delayed Eγ, Iγ following decay of isomeric states using LISE spectrometer at GANIL. Deduced J, π, $T_{1/2}$, multipolarities.

2009Cr03: ^{9}Be(^{76}Ge,X) E=130 MeV/nucleon. Fragments were separated using A1900 FRS. Measured prompt γ rays using SeGa array of Ge detectors. Three γ rays at 43.0, 128.4 and 172.1 keV were reported from the decay of the isomer.

2012Ka36: ^{50}K isomer produced in ^{9}Be(^{238}U,F),E=345 MeV/nucleon provided by the RIBF accelerator complex at RIKEN facility. Fission fragments were separated and analyzed by BigRIPS separator, transported to focal plane of ZeroDegree spectrometer and finally implanted in an aluminum stopper. Particle identification was achieved by ΔE-TOF-Bρ method. Delayed gamma rays from microsecond isomers were detected by three clover-type HPGe detectors. Measured Eγ, Iγ, γγ-coin, isomer half-life.

^{50}K Levels

E(level)	J^π †	$T_{1/2}$	Comments
0.0	$0^{(-)}$		J^π: (1^-) proposed by 2009Cr03 and 1999DaZQ based on $\pi s^{-1}_{1/2}\otimes\nu p^{-1}_{3/2}$ configuration. (0^-) proposed by 1998Ba80. Spin=0 measured in hyperfine structure.
44.0? *6*	$(1,2^-)$		E(level): ordering of the 127.4-44 γ cascade is not established. Reverse ordering is proposed by 2009Cr03 giving a level at 128 keV, instead. J^π: (1^-) suggested by 1999DaZQ from multipolarity assignments.
70.2? *7*	$(1,2^-)$		E(level): level considered as uncertain by the evaluators in view of weak and unknown ordering of the 101-70 γ cascade. Also 2009Cr03 do not report 70γ and 101γ. J^π: (1^-) suggested by 1999DaZQ from multipolarity assignments.
172.0 *4*	(2^-)	131 ns *40*	$T_{1/2}$: weighted average of 125 ns *40* (1999DaZQ, from γ-ray decay curve); 138 ns *+50−41* (2012Ka36, γ-decay curve). Other: <500 ns (2009Cr03). J^π: 3^- proposed by 2009Cr03 and 1999DaZQ based on (E2) multipolarity of 171γ and J^π(g.s.)=(1^-). Number of implanted fragments=2.0×10^4 (2012Ka36).

† From Adopted Levels.

γ(^{50}K)

E_γ †	I_γ †&	E_i(level)	J^π_i	E_f	J^π_f	Mult.	Comments
44@ *1*		44.0?	$(1,2^-)$	0.0	$0^{(-)}$		E_γ: 43.5 (2009Cr03). Mult.: M1 suggested by 1999DaZQ from comparison of the deduced transition probabilities with Weisskopf estimates.
70#@ *1*		70.2?	$(1,2^-)$	0.0	$0^{(-)}$		
101@ *1*		172.0	(2^-)	70.2?	$(1,2^-)$		Mult.: E2 suggested by 1999DaZQ.
128.1@ *5*	82 *22*	172.0	(2^-)	44.0?	$(1,2^-)$	(E2)‡	B(E2)(W.u.)=3.4 *15* If M1, B(M1(W.u.)=3.7×10^{-5} *16*. If E1, B(E1)(W.u.)=8.2×10^{-7} *35*. E_γ: unweighted average of 127.4 *5* (1999DaZQ), 128.4 (2009Cr03), 128.5 *5* (2012Ka36).
172.0 *5*	100 *25*	172.0	(2^-)	0.0	$0^{(-)}$	(E2)‡	B(E2)(W.u.)=1.4 *6* If M1, B(M1)(W.u.)=1.8×10^{-5} *8*. If E1, B(E1)(W.u.)=4.1×10^{-7} *14*. E_γ: unweighted average of 171.4 *5* (1999DaZQ), 172.1 (2009Cr03), 172.4 *5* (2012Ka36).

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$\gamma(^{50}K)$ (continued)

† From 1999DaZQ, unless otherwise noted.
‡ E2 suggested by 1999DaZQ, in contrast to M1 or E1, based on Weisskopf estimates for E2, M1 and E1 transitions.
# Weak γ-ray.
@ Ordering of the 127-44 and 101-70 γ cascades can be reversed as in 2009Cr03 for the former.
& For absolute intensity per 100 decays, multiply by ≈0.55.

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