Adopted Levels, Gammas

History			
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	ENSDF	30-Apr-2022

Q(β^-)=19120 *SY*; S(n)=2450 *SY*; S(p)=19380 *SY*; Q(α)=−16250 *SY* 2021Wa16

Estimated uncertainties (2021Wa16): 530 for Q(β^-), 640 for S(n), 940 for S(p), 860 for Q(α).

Q(β^-n)=17560 *500*, S(2n)=3380 *510* (syst, 2021Wa16).

S(2p)=42220 (theory, 2019Mo01).

Q(β^-2n)=13720 *500*, Q(β^-3n)=10520 *500*, Q(β^-4n)=4520 *500*, Q(β^-5n)=−300 *500*, all from syst, deduced by evaluator from relevant mass values in 2021Wa16.

2009Ta24, 2009Ta05: ^{55}K identified by fragmentation of ^{76}Ge beam at 132 MeV/nucleon at NSCL facility using A1900 fragment separator combined with S800 analysis beam line to form a two stage separator system. The transmitted fragments were analyzed event-by-event in momentum and particle identification. The nuclei of interest were stopped in eight Si diodes which provided measurement of energy loss, nuclear charge and total kinetic energy. The time-of-flight of each particle that reached the detector stack was measured in four different ways using plastic scintillators, Si detectors, and parallel-plate avalanche counters. The simultaneous measurement of ΔE signals, the magnetic rigidity, total kinetic energy and the time-of-flight (TOF) provided unambiguous identification of the atomic number, charge state and mass number.

Theoretical calculations: five primary references (two for structure and three for ^{55}K decay) retrieved from the NSR database at www.nndc.bnl.gov/nsr/. These are listed in this dataset under 'document' records.

Additional information 1.

^{55}K Levels

Cross Reference (XREF) Flags

A ^{1}H(^{56}Ca,2pγ)

E(level)	J$^{\pi}$[†]	T$_{1/2}$	XREF	Comments
0	(3/2$^+$)		A	%β^-=100; %β^-n=?; %β^-2n=?; %β^-3n=?; %β^-4n=? Theoretical T$_{1/2}$=9.2 ms, %β^-n=87, %β^-2n=7, %β^-3n=1, %β^-4n=0 (2019Mo01). Theoretical T$_{1/2}$=9.9 ms, %β^-n=82.6, 80.5; %β^-2n=5.3, 7.8; %β^-3n=1.5, 1.2; %β^-4n=0 (2021Mi17). Measured production σ=4×10^{-11} mb *+3−2* (read by the evaluator from Fig. 2 in 2009Ta05). E(level): fragment observed by 2009Ta05 is assumed to be in the ground state of ^{55}K. J$^{\pi}$: others: 3/2$^+$ (syst, 2021Ko07), 1/2$^+$ (theory, 2019Mo01). T$_{1/2}$: experimental half-life of ^{55}K g.s. is unknown. Lower limit of ≈360 ns is estimated from time-of-flight as in 2005St29 (from the same lab as 2009Ta05). From a trend of decreasing half-lives with increasing neutron number in neutron-rich nuclei, evaluator estimates T$_{1/2}$<10 ms from known half-lives of 110 ms for ^{52}K, 30 ms for ^{53}K and 10 ms for ^{54}K. Other: 10 ms (syst, 2021Ko07).
668 *10*	(1/2$^+$)	<37 ps	A	E(level): from Eγ. T$_{1/2}$: mean lifetime τ<53 ps, estimated from peak-shape analysis in ^{1}H(^{56}Ca,2p) (2022Ko06).

[†] from theoretical calculations (2022Ko06) using different models: large-scale shell model (LSSM), ab-initio valence-space in-medium similarity renormalization group (VS-IMSRG), and full-space self-consistent Green's function (SCGF NNLO$_{sat}$ and SCGF NN+3N(lnl)).

Adopted Levels, Gammas (continued)

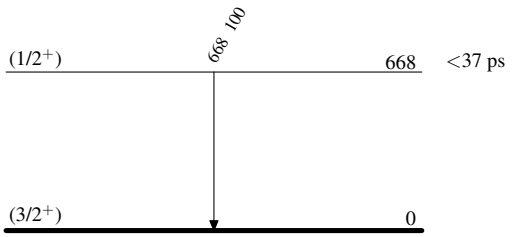
γ(^{55}K)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Comments
668	(1/2$^+$)	668 *10*	100	0	(3/2$^+$)	If M1, B(M1)(W.u.)>0.0020. If E2, B(E2)(W.u.)>9.2.

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level



$^{55}_{19}K_{36}$