Adopted Levels

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	ENSDF	25-Mar-2022

Q(β^-)=21490 *SY*; S(n)=560 *SY*; S(p)=19120 *CA*; Q(α)=−16800 *SY* 2021Wa16,2019Mo01
S(p) from theory (2019Mo01). Other values are from 2019Mo01.
Estimated uncertainties (2021Wa16): 650 for Q(β^-), 780 for S(n), 920 for Q(α).
Q(β^-n)=18560 *620*, S(2n)=3010 *720* (syst, 2021Wa16). S(2p)=43320 (theory,2019Mo01).
Q(β^-2n)=17000 *600* (syst), Q(β^-3n)=13160 *600* (syst), Q(β^-4n)=9960 *600* (syst), Q(β^-5n)=3950 *600* (syst) deduced by evaluator from relevant mass excesses in 2021Wa16.
2009Ta24, 2009Ta05: ^{56}K identified by fragmentation of ^{76}Ge beam at 132 MeV/nucleon with W target 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: only one primary reference extracted from the NSR database (www.nndc.bnl.gov/nsr/) is listed under document records.
Additional information 1.

^{56}K Levels

E(level)	Comments
0	%β^-=100; %β^-n=?; %β^-2n=?; %β^-3n=?; %β^-4n=? %β^-5n=? As β^- is the only possible decay mode, followed by β^--delayed-neutrons, 100% β^- decay is assigned by inference. Theoretical $T_{1/2}$=3.9 ms, %β^-n=51, %β^-2n=34, %β^-3n=1, %β^-4n=0, %β^-5n=0 (2019Mo01). Theoretical $T_{1/2}$=7.3 ms, %β^-n=18.9, 21.2; %β^-2n=65.3, 62.8; %β^-3n=2.0, 2.3; %β^-4n=0.34, 0.21; %β^-5n=0 (2021Mi17). Measured cross section=8×10^{-11} mb *3* for W target (read by the evaluator from Fig. 8 in 2009Ta24). E(level): fragment observed by 2009Ta05, 2009Ta24 is assumed to be in the ground state of ^{56}K. J$^\pi$: 1$^-$ or 2$^-$ from Ω_p=1/2$^+$ and Ω_n=3/2$^-$ (theory,2019Mo01); 2$^-$ from systematics (2021Ko07). $T_{1/2}$: >620 ns estimated from time-of-flight of 620-650 ns (from (e-mail reply of Sept 23, 2009 from O. Tarasov). Actual half-life is expected to be much longer as suggested by theoretical values of 3.9 ms (2019Mo01), 7.3 ms (2021Mi17), and 5 ms from systematics (2021Ko07). From a decreasing trend of half-lives with increasing neutron number in neutron-rich nuclei, $T_{1/2}$ of ^{56}K is expected to be <10 ms from known half-lives of 10 ms for ^{54}K, 30 ms for ^{53}K and 110 ms for ^{52}K.