Adopted Levels

History

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

Q(β^-)=21070 *SY*; S(n)=1270 *SY*; S(p)=20640 *SY*; Q(α)=−17660 *SY* 2017Wa10

Estimated ΔQ(β^-)=780, ΔS(n)=850, ΔS(p)=900, ΔQ(α)=920 (2017Wa10).

Q(β^-n)=16860 *720*, S(2n)=4120 *780* (syst, 2017Wa10). S(2p)=44540 (2019Mo01, theory). Q(β^-2n)=14590 *980*, Q(β^-3n)=8890 *930* (syst), deduced by evaluators from mass excesses in 2017Wa10.

2009Ta05, 2009Ta24: ^{50}Cl 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.

Theory references: consult the NSR database (www.nndc.bnl.gov/nsr/) for two references for structure calculations.

Additional information 1.

^{50}Cl Levels

E(level)	Comments
0	%β^-=100; %β^-n=?; %β^-2n=?; %β^-3n=? β^- is the only possible decay mode, followed by β-delayed neutron emissions, thus 100% β^- decay is assigned by inference, although, no radiation from the decay of ^{50}Cl has yet been observed. Theoretical $T_{1/2}$=5.5 ms, %β^-n=66, %β^-2n=18 (2019Mo01). Theoretical $T_{1/2}$=17.2 ms, %β^-n=5.2, %β^-2n=50.6, %β^-3n=2.6 (2016Ma12). E(level): observed activity is assumed to correspond to the ground state of ^{50}Cl. Measured cross section=0.037 pb *+43−26*, received in e-mail reply of Nov 11, 2009 from O. Tarasov (first author of 2009Ta05). E(level): fragment observed by 2009Ta05 is assumed to be in the ground state of ^{50}Cl. J^π: 2^-,3^- from $\Omega=1/2^+$ for proton and $\Omega=5/2^-$ for neutron in theoretical calculations by 2019Mo01. $T_{1/2}$: half-life of the decay of ^{50}Cl has not yet been measured. $T_{1/2}$>650 ns from time-of-flight of 620-650 ns, given in e-mail reply of Sept 23, 2009 from O. Tarasov. From a general decreasing trend of half-lives with increasing neutron number, $T_{1/2}$ for ^{50}Cl g.s. is expected to be <50 ms, based on measured half-lives of 101 ms for ^{47}Cl, 232 ms for ^{46}Cl, 413 ms for ^{45}Cl, and 560 ms for ^{44}Cl available in the ENSDF database (as of March 25, 2019). 2017Au03 give 20 ms from systematic trend.