Adopted Levels

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen	NDS 194,460 (2024)	31-Oct-2022

Q(β^-)=7220 *syst*; S(n)=3660 *syst*; S(p)=12440 *syst*; Q(α)=−3710 *syst* 2021Wa16
Estimated uncertainties (2021Wa16): ΔQ(β^-)=ΔS(n)=400, ΔS(p)=ΔS(α)=570.
S(2n)=9050 *400*, S(2p)=24010 *640*, Q(β^-n)=1650 *400* (syst, 2021Wa16).

2017Wu04: ^{165}Sm was produced in ^{9}Be(^{238}U,F), E(^{238}U)=345 MeV/nucleon reaction, followed by separation of fragments based on Bρ-ΔE-TOF method using the BigRIPS separator at RIBF-RIKEN facility, optimized for the transmission of ^{158}Nd and ^{170}Dy ions. The reaction products were transported through the ZeroDegree spectrometer and implanted into the decay counting system WAS3ABi, surrounded by the EURICA array of 84 HPGe detectors for γ detection. Typical implantation rate was ≈100 ions/s. Measured time distribution of (implanted ion)β^-, (implanted ion)$\beta^-\gamma$ and (implanted ions)γ correlated events, and half-life of decay of ^{165}Sm g.s.

2012Ku26: ^{165}Sm was produced and identified in ^{9}Be(^{238}U,F), E=1 GeV/nucleon reaction using SIS-18 synchrotron facility at GSI. Target was 1.6 g/cm^2 ^{9}Be placed at the entrance of projectile Fragment Separator (FRS). Particle identification was achieved by event-by-event in-flight analysis of time-of-flight, energy loss measurement, and magnetic rigidity (tof-ΔE′-Bρ). Time-of-flight measured using two plastic scintillation detectors, energy loss or deposit by ionization chambers (MUSIC), and magnetic rigidity by four time-projection chambers (TPC), which also provided energy deposit information. Isomer tagging method for known μs isomers was used to verify event-by-event identification and in-flight separation of new isotopes. Gamma rays from the known isomers were recorded in coincidence with the incoming ions using either the RISING array of Ge detectors at GSI or only two Ge detectors, a stopper foil and a scintillator for veto signal. Measured production cross section. Comparison of measured σ with predictions from ABRABLA model and EPAX-3 model.

^{165}Sm Levels

E(level)	$T_{1/2}$	Comments
0	0.98 s *21*	%β^-=100; %β^-n=? %β^-: Only β^- decay mode is expected. Theoretical $T_{1/2}$=0.626 s, %β^-n=0.0 (2019Mo01). Theoretical $T_{1/2}$=0.785 s, %β^-n=0.761 and 0.497 for different fission barriers (2021Mi17). E(level): it is assumed that the observed events correspond to ground-state activity of ^{165}Sm. J^π: (5/2$^-$) from systematics of known quasiparticle states in neighboring nuclei and the proposed tentative configuration=ν5/2[512] (evaluators). $T_{1/2}$: from 2017Wu04, fit to the (implanted ion)β^--correlated decay curve using the least-squares and maximum-likelihood methods, by including contributions from the parent, daughter and grand-daughter decays, assuming a constant background. Production σ (at 1 GeV/nucleon)=7.8 nb *16* (2012Ku26).