Adopted Levels

History			
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	ENSDF	15-Sep-2023

Q(β^-)=19650 *syst*; S(n)=70 *syst*; S(p)=24900 *calc*; Q(α)=−19120 *syst* 2021Wa16,2019Mo01

Estimated uncertainties (2021Wa16): 710 for Q(β^-), 300 for S(n), 840 for Q(α).

S(p) from 2019Mo01. Q(β^-), S(n), Q(α) from 2021Wa16.

S(2n)=2950 *710*, Q(β^-n)=16600 *770* (syst, 2021Wa16). S(2p)=47650 (2019Mo01, theory). Q(β^-2n)=13830 *610*, Q(β^-3n)=9910 *590*, Q(β^-4n)=6370 *600*, Q(β^-5n)=520 *590* (syst, deduced by evaluator from relevant mass excesses in 2021Wa16).

1990Le03: ^{64}Ni(^{48}Ca,X),E(^{48}Ca)=44 MeV/nucleon; measured fragment spectra versus atomic number using LISE spectrometer at GANIL. Authors stated that no counts were observed for ^{49}S.

2018Ta17: ^{49}S formed by fragmentation of ^{70}Zn^{30+} beam at 345 MeV/nucleon from RIKEN-RIBF accelerator complex. Rotating target of ^{9}Be of 15 mm thickness were located at the BigRIPS two-stage ion separator. Particle identification (PID) was achieved by measuring time of flight (TOF), energy loss (ΔE), total kinetic energy (TKE), and magnetic rigidity (Bρ) through event by event analysis of reaction products. Particles of interest were stopped in a 76-mm thick CsI crystal after passing through six 1-mm thick silicon p-i-n diodes, while the magnetic rigidity (Bρ) of the fragments was reconstructed from position and angle measurements at foci using two sets of position-sensitive parallel plate avalanche counters (PPACs). Optimization was done using LISE^{++} simulation code. A total of five events were assigned to ^{49}S.

Theoretical calculations:

2019Ne02: calculated S(n), S(2n), posterior probability of existence of neutron-rich nuclei using Bayesian model averaging.

2018Yo06: calculated T$_{1/2}$(β), β-delayed neutron emission probability (Pn), Gamow-Teller (GT) strength distribution, and location of the Gamow-Teller giant resonances using large-scale shell-model with and without first-forbidden (FF) transitions.

2012Ho19: calculated point matter, neutron and proton radii, quadrupole deformation parameter using Skyrme-Hartree-Fock approach with SkM* and SLy4 interactions.

^{49}S Levels

E(level)	Comments
0	%β^-=100; %β^-n=?; %β^-2n=?; %β^-3n=?; %β^-4n=? %β^-5n=?
	Only the β^- decay mode is expected, followed by delayed neutron decays, thus 100% β^- decay is assigned by inference. However, S(n)=70 *300* (syst, 2021Wa16) and 30 keV (theory, 2019Mo01) suggests this nuclide on the margin of being stable towards one-neutron emission.
	A total of five events were assigned to ^{49}S, one event each with tuned setting of the spectrometer for ^{53}Cl and ^{57}K, and three events for setting on ^{54}Ar (2018Ta17).
	Theoretical T$_{1/2}$(β)=4.0 ms, %β^-n=31, %β^-2n=14, %β^-3n=1, %β^-4n=0, %β^-5n=0 (2019Mo01).
	Theoretical T$_{1/2}$(β)=12.4 ms, %β^-n=27.4, 26.8; %β^-2n=22.2, 24.2; %β^-3n=2.1, 2.0; %β^-4n=0.026, 0.023; %β^-5n=0 (2021Mi17); two values for a decay mode refer to different fission barriers.
	The observed events are assumed to correspond to the ground-state of ^{49}S.
	T$_{1/2}$: half-life of the ^{49}S activity has not been measured. It is expected to be greater than the time-of-flight through the beam transport system, which may be about 500 ns. From systematics of half-lives of neighboring S isotopes, the half-life is expected to be <25 ms from 50 ms for ^{46}S, 68 ms for ^{45}S, 117 ms for ^{44}S and 265 ms for ^{43}S, assuming a decreasing trend of half-life as neutron number increases in neutron-rich nuclei. From systematics, T$_{1/2}$=4 ms in 2021Ko07.
	J$^\pi$: 5/2$^-$ (2019Mo01, theory); 1/2$^-$ (syst, 2021Ko07).