

Adopted Levels

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

$Q(\beta^-) = -17370$ SY; $S(n) = 18470$ SY; $S(p) = -35 \times 10^1$ 16; $Q(\alpha) = -672 \times 10^1$ 16 [2021Wa16](#)

Estimated uncertainties ([2021Wa16](#)): 430 for $Q(\beta^-)$ and $S(n)$.

$Q(\epsilon) = 13700$ 160, $Q(\epsilon p) = 9090$ 160, $S(2n) = 34640$ 520 (syst), $S(2p) = 3550$ 160 ([2021Wa16](#)).

[1987Po04](#): ^{55}Cu produced and identified in $\text{Ni}(^{58}\text{Ni}, X)$, $E = 55$ MeV/nucleon, followed by mass separation via tof and ΔE -E method using LISE separator at GANIL, with a total of 75 events assigned to ^{55}Cu in their mass spectral Fig. 2.

[2007BI09](#): ^{55}Cu produced in $\text{Ni}(^{70}\text{Ge}, X)$, $E = 71.6$ MeV/nucleon using LISE-3 separator at GANIL. Measured production cross-sections of ≈ 80 pb for ^{55}Cu , and compared with theoretical values.

[2007Do17](#): ^{55}Cu produced and identified in fragmentation of 74.5 MeV/nucleon $^{58}\text{Ni}^{26+}$ beam with nickel target using SISSE/LISE3 separator facility in GANIL. Fragment identification by energy loss, residual energy and time-of-flight measurements using two micro-channel plate (MCP) detectors and Si detectors. Double-sided silicon-strip detectors (DSSSD) and a thick Si(Li) detector were used to detect implanted events, charged particles and β particles. The γ rays were detected by four Ge detectors. Coincidences measured between charged particles and γ rays. $T_{1/2}$ measured by time correlation of implantation events due to ^{55}Cu and subsequent emission of protons and γ rays. Total proton branching ratio is from time spectrum of events with energy > 900 keV in the charged-particle spectrum.

[2013Tr09](#): ^{55}Cu produced in $^9\text{Be}(^{58}\text{Ni}^{28+}, p2n)$, $E(^{58}\text{Ni}) = 160$ MeV/nucleon particle-transfer reaction followed by separation using A1900 fragment separator and NSCL Radio Frequency Fragment separation at NSCL, MSU facility. Dominant fragments were ^{54}Ni and ^{55}Cu . The known decay characteristics of ^{54}Ni served as calibration of data for ^{55}Cu decay. The fragments were stopped in a planar Ge double-sided strip detectors (GeDSSD) surrounded by SeGA array of two rings of eight Ge detectors each on either side. Measured $E\gamma$, $I\gamma$, (implants) β -correlated events, $\beta\gamma$ -, $\gamma\gamma$ - and $\beta\gamma\gamma$ -coin, half-life of ^{55}Cu g.s. Deduced levels, J, π , IAS doublet, beta feedings, $\log ft$ values, isospin mixing. Discovered split isobaric analog state (IAS) in ^{55}Ni .

Additional information 1.

Mass measurement: [2013Ya03](#).

[2021Ru09](#): shell-model calculations of level scheme of ^{55}Cu using KB3G56-ISB interaction, and following population of levels in ^{55}Cu via one-proton and one-neutron removals from a radioactive beams of ^{56}Zn and ^{56}Cu , respectively.

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

 ^{55}Cu Levels

E(level)	J^π	$T_{1/2}$	Comments
0	(3/2 ⁻)	55.9 ms 18	$\% \epsilon + \% \beta^+ = 100$; $\% \epsilon p = ?$ $S(p)(^{55}\text{Ni}) = 4615$ keV, thus no delayed protons can be emitted from the IAS doublet identified at 4579+4599. 2013Tr09 state that no protons were detected indicating that delayed proton branch is small. 2007Do17 reported a β^+ -delayed proton branch of 15.0% 43, which appears questionable in view of non-confirmation by 2013Tr09 . J^π : from shell-model calculations using KB3G56-ISB interaction (2021Ru09). Same J^π is proposed by 2013Tr09 , with $T_z = -3/2$. Others: 3/2 ⁻ (syst, 2021Ko07), $\Omega p = 1/2^-$ (theory, 2019Mo01). $T_{1/2}$: weighted average of 57 ms 3 (2013Tr09 , from (implant) β correlated decay curve fitted for parent decay, growth and decay of daughter nuclide ^{55}Ni and background); and 55.5 ms 18 (2020Gi02 , from implants-decay correlated events, same $T_{1/2}$ in 2017GoZT). Other: 27 ms 8 (2007Do17 , from β^+ -delayed proton decay curve) appears questionable since 2013Tr09 did not observe any proton decay branch from ^{55}Cu decay.