^{54}Zn 2p decay 2011As08,2005Bl15

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Yang Dong, Huo Junde	NDS 128, 185 (2015)	10-Jul-2015

Parent: ^{54}Zn: E=0.0; $J^\pi=0^+$; $T_{1/2}$=1.59 ms *+60−35*; Q(2p)=1.28×10^3 *21*; %2p decay=88 *10*

^{54}Zn-$T_{1/2}$: Determined as 1.59 ms $^{60-35}$ (2011As08) by time difference between implantation and decay events. Previous result: 3.2 ms *+18−8* (2005Bl15).

^{54}Zn-Q(2p): From 2011As08. Previous result: 1480 keV *20* (2005Bl15).

^{54}Zn-%2p decay: %2p=92 *+6−13* (2011As08). Previous result: 87 $^{10-17}$ (2005Bl15).

2005Bl15: ^{54}Zn isotope produced by the Ni(^{58}Ni^{26+},X) quasifragmentation reaction at E=74.5 MeV/nucleon. Fragments mass-separated by the α-LISE3 separator and identified on event-by-event basis with two micro-channel plate (MCP) detectors and four Si detectors. Measured E(fragments), Eβ, fragment energy loss, time of flight with four Si detectors and a double-sided Si-strip detector (DSSSD). The detector setup yielded eight fragment identification parameters to unambiguously identify the different fragments and reject any background. All eight parameters of an event had to lie within three σ's of the predefined values in order to be accepted. σ=100fb. β-delayed proton decay of ^{52}Ni with energies comparable to those in ENSDF were also observed, indicating the occurrence of 2p radioactivity.

2011As08: Direct observation of two protons from ^{54}Zn decay. ^{54}Zn produced by quasifragmentation of a ^{58}Ni beam, E=74.5 MeV/nucleon, on a 200 μm thick natural Ni target. ^{54}Zn fragments selected by magnetic-rigidity, energy-loss, and velocity analysis using the LISE3 separator at GANIL. Fragments identified individually by two silicon detectors by means of an energy-loss and time-of-flight analysis. Decays were detected in a time-projection chamber(TPC), where signals from four gas electron multipliers (GEM) detected in a two-dimensional strip detector combined with drift-time analysis could be used to reconstruct the tracks of the particles in three dimensions. Measured energy loss, E(particle), decay event counts, angular correlation between two protons. A total of 18 ^{54}Zn events detected, thirteen correlated in time and space to decays; five decay events could not be recorded due to the data acquisition dead time and short half-life of ^{54}Zn. Two decay events emitted protons which did nonstop in the active volume of the chamber, thus no energy information could be obtained. The remaining eleven events were used to determine the $T_{1/2}$, branching ratio, and Q(2p) data. See also 2012As02.

^{52}Ni Levels

E(level)	J^π
0	0^+