Adopted Levels:tentative

History			
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	ENSDF	31-Jan-2021

S(n)=15180 *CA*; S(p)=50 *CA*; Q(α)=5780 *CA* 2019Mo01

S(2n)=28110, S(2p)=−1800, Q(ε)=10730 (theory, 2019Mo01).

Q(α)=4486 keV *166* from measured Eα=4320 keV *160*.

2008Ko04: based on production cross section measurements for neighboring nuclei, and theoretical calculations for the production of ^{108}Xe isotope using HIVAP fusion evaporation code, optimum beam energy was proposed as 240 MeV for ^{54}Fe(^{58}Ni,X) reaction for the production of ^{108}Xe isotope.

2018Au04: ^{108}Xe nuclide produced and identified through ^{108}Xe → ^{104}Te → ^{100}Sn α-decay chain observed in the study of ^{54}Fe(^{58}Ni,4n)^{108}Xe,E=245 MeV reaction at the ATLAS-ANL facility. Target=450 μg/cm^2 thick, self-supporting mounted on a rotating wheel. Mass/charge ratio of reaction products was measured using Fragment Mass Analyzer (FMA) and position-sensitive parallel-grid avalanche counter (PGAC). The separated recoils were implanted in a double-sided silicon detector (DSSD). The α particles escaping the DSSD detector were detected by BOX detector of eight single-sided silicon detectors. Measured two recoil-α correlated events, Eα emitted by ^{108}Xe and ^{104}Te, and α-decay half-lives both the isotopes.

2019Xi06: ^{108}Xe produced in ^{54}Fe(^{58}Ni,X),E(^{58}Ni)=250 MeV at the tandem accelerator of the Japan Atomic Energy Agency (JAEA), using 550 μg/cm^2 thick target enriched in ^{54}Fe. Ions were separated by the Recoil Mass Separator (RMS) and implanted into an inorganic scintillator yttrium aluminum perovskite: cerium (YAP:Ce) placed at the focal plane of RMS separator. Two correlated events were observed, but with ambiguous assignment to ^{108}Xe → ^{104}Te → ^{100}Sn α-decay chain. Authors measured energy spectra, implant-decay energy and time correlations, and tentative half-lives of the decays of ^{108}Xe and ^{104}Te. However, no conclusive evidence was found by the authors for the decay chain ^{108}Xe → ^{104}Te → ^{100}Sn within three days of experiment run.

Theoretical calculations: 31 primary reference in the NSR database (available at www.nndc.bnl.gov/nsr/), 22 for nuclear structure and nine for radioactive decay half-lives and other properties.

^{108}Xe Levels

E(level)	J$^\pi$	T$_{1/2}$	Comments
0?	0$^+$	54 μs *+57−21*	%α≈100 (2018Au04); %2p=? %α decay assumed as 100% in 2018Au04. From theoretical β-decay half-life of 184.4 ms and α-decay half-life of 8.3 ps (2019Mo01), $\varepsilon+\beta^+$ decay is expected to be negligible. However, 2p decay mode is possible from theoretical S(2p)(^{108}Xe)=−1800 keV (2019Mo01). 2018Au04 reported observation of two recoil-α correlated events, which were assigned to ^{108}Xe → ^{104}Te → ^{100}Sn α-decay chain, and on this basis half-lives of decays of ^{108}Xe and ^{104}Te were deduced. 2019Xi06 also reported observation of two recoil-α correlated events, but stated that these may be due to ^{108}Xe → ^{104}Te → ^{100}Sn α-decay chain, or could also be due to β-delayed proton emission from more abundant radioactivities. T$_{1/2}$: weighted average of 58 μs *+106−23* (2018Au04, from time difference between a recoil implantation and subsequent decay event in the same pixel of DSSD using maximum-likelihood method); 30 μs *+57−12* (2019Xi06, from analysis of time distribution of implant-α correlated curve by maximum-likelihood method). In each experiment, two correlated events were observed, with a tentative assignment in 2019Xi06. Eα=4320 keV *160* from weighted average of measured Eα=4.56 MeV *26* and 4.23 MeV *20* (for two correlated events in 2018Au04); and measured 4290 *160* (from the two correlated events in 2019Xi06). Measured production σ<130 pb (2019Xi06) for ^{108}Xe, which, according to the authors is about an order of magnitude below the expected value of ≈1 nb, based on earlier cross section measurements for neighboring isotopes, and theoretical predictions of the HIVAP fusion-evaporation code.