

^{104}Te α decay:tentative 2018Au04,2019Xi06

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen		NDS 172, 1 (2021)	31-Jan-2021

Parent: ^{104}Te : $E=0$; $J^\pi=0^+$; $T_{1/2}<18$ ns; $Q(\alpha)=5.1\times 10^3$ eV; $\% \alpha$ decay ≈ 100.0

^{104}Te - $T_{1/2}$: From analysis of second derivative of DSSD traces of the two events, corresponding to $^{108}\text{Xe} - ^{104}\text{Te}$ pileup events (2018Au04). Other: <4 ns (2019Xi06), from analysis of traces of two events in decay-decay correlation.

^{104}Te - $Q(\alpha)$: From 2018Au04, based on $E\alpha=4900$ keV 200.

^{104}Te - $\% \alpha$ decay: Assumed $\% \alpha=100$ for possible α decay of ^{104}Te (2018Au04).

2018Au04: ^{104}Te from α decay of ^{108}Xe which was identified as a heavy α -emitting self-conjugate nucleus through $^{108}\text{Xe} \rightarrow ^{104}\text{Te} \rightarrow ^{100}\text{Sn}$ α -decay chain observed in the study of $^{54}\text{Fe}(^{58}\text{Ni},4n)^{108}\text{Xe}$, $E=245$ MeV reaction at ATLAS-ANL facility. Target= $450 \mu\text{g}/\text{cm}^2$ 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 recoil- α correlated events, $E\alpha$ emitted by ^{108}Xe and its α -decay half-life. Two recoil- α correlated events were observed and analyzed in this work.

2019Xi06: ^{108}Xe ions were produced from fusion evaporation $E=250$ MeV ^{58}Ni beam on $550 \mu\text{g}/\text{cm}^2$ enriched ^{54}Fe target, with the beam from the tandem accelerator of the Japan Atomic Energy Agency (JAEA). Ions were separated by the Recoil Mass Separator (RMS) and implanted into the YAP:Ce detector at the focal plane of RMS. Measured energy spectra, implant-decay energy and time correlations.

 ^{100}Sn Levels

E(level)	J^π	$T_{1/2}$	Comments
0	0^+	1.18 s 8	$T_{1/2}$: from the Adopted Levels.

 α radiations

$E\alpha$	E(level)	Comments
490×10^1 20	0	$E\alpha$: measured by 2018Au04. This value is the average of $E\alpha=4.73$ MeV 24 from the first event, and 5.06 MeV 25 from the second event (2018Au04).