

Adopted Levels

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Michael Birch	ENSDF	15-May-2011

$S(p)=1.76\times 10^3$ 6; $Q(\alpha)=8.20\times 10^3$ 3 [2012Wa38](#)

Note: Current evaluation has used the following Q record 10810 calc 1750 60 8202 31 [2011AuZZ,1997Mo25](#).

$S(n)$ from [1997Mo25](#), $S(p)$ from [2011AuZZ](#), $Q(\alpha)$ deduced from measured $E\alpha=8044$ 30 ([2010He25](#)) based on two events where the entire energy deposition occurred in the pssd.

$Q(\epsilon p)=5860$ 60, $S(2p)=1460$ 40 ([2011AuZZ](#)). $S(2n)=19730$ ([1997Mo25](#),calculated),

[2006Ku07](#): $^9\text{Be}(^{238}\text{U},X)$, $E=1$ GeV/nucleon. Fragmentation products were identified by combining time-of-flight, position, and energy-loss information. Indications were found for the occurrence of a few events at the position corresponding to ^{208}Th ; however, the statistics and the resolution of the ion identification procedure at this position were not sufficient to claim unambiguous observation of this isotope. An upper limit for the production of ^{208}Th was set at <0.67 nb 14. Experiments at GSI facility.

[2010He25](#): ^{208}Th nuclide identified in $^{147}\text{Sm}(^{64}\text{Ni},3n)$ complete fusion reaction with beam energies 288 MeV and 294 MeV produced by the UNILAC of the GSI facility. Target consisted of $327\text{--}546\text{ }\mu\text{g}/\text{cm}^2$ thick $^{147}\text{SmF}_3$ enriched to 96.4% purity evaporated onto a $40\text{ }\mu\text{g}/\text{cm}^2$ carbon foil and covered with a $10\text{ }\mu\text{g}/\text{cm}^2$ carbon layer. Evaporation residues were velocity filtered by SHIP and implanted into a $300\text{ }\mu\text{m}$ thick, $35\times 80\text{ mm}^2$ 16-strip positron-sensitive silicon detector (PSSD) mounted at the focal plane of SHIP, each with an energy resolution of about 25 keV (FWHM). Six silicon box detectors were mounted in an open box geometry upstream from the PSSD to measure the energy of α particles which escaped from the PSSD in the backward direction. The sum of the energy depositions in both the PSSD and box detectors gave the full energy of the escaping α -particle, though at a lower energy resolution than the PSSD alone. Three time-of-flight (tof) detectors in front of the box+PSSD system were used to distinguish reaction products from scattered beam particles, transfer reaction products and scattered target-like nuclei. Identification based on the observation of energy, position and time correlated α -decay chains. A fourfold segmented Clover Ge detector was also installed for α - γ or α (x ray) coincidence measurements with $\Delta T(\alpha\text{--}\gamma)\leq 5\text{ }\mu\text{s}$, however no coincidences were seen.

[2008Sc02](#): calculated Fermi level and proton separation energy using the spherical Hartree-Fock-Bogoliubov mean-field theory with a finite-range force supplemented by continuum and particle-number projection effects.

 ^{208}Th Levels

E(level)	J^π	$T_{1/2}$	Comments
0	0^+	$1.7\text{ ms} +17\text{--}6$	$\% \alpha \approx 100$ From calculated half-lives (1997Mo25) of 1.98 s for β decay and 18.2 ms for α decay, $\% \epsilon + \beta^+ \leq 1\%$. $T_{1/2}$: measured by 2010He25 from four events which occurred in the box+PSSD system. 2011AuZY list 2.4 ms 12 by symmetrizing the value quoted in 2010He25. Production $\sigma=95\text{ pb} +219\text{--}79$ for $E(^{64}\text{Ni})=294\text{ MeV}$ for one event; $\sigma=22\text{ pb} +20\text{--}13$ for $E(^{64}\text{Ni})=288\text{ MeV}$ for three events (2010He25). Measured $E\alpha=8044$ 30 (2010He25) from decay of ^{208}Th; assumed to be a g.s. to g.s. transition.