

Adopted Levels

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	ENSDF	31-May-2015

$Q(\beta^-)=9960$ SY; $S(n)=4760$ SY; $S(p)=17790$ SY; $Q(\alpha)=-11480$ SY [2012Wa38](#)

Estimated uncertainties ([2012Wa38](#)): 500 for $Q(\beta^-)$, $S(p)$ and $Q(\alpha)$, 360 for $S(n)$.

$S(2n)=7890$ 310, $Q(\beta^-n)=6280$ 300 (syst,[2012Wa38](#)). $S(2p)=33090$ (theory,[1997Mo25](#)).

[1997Be70](#), [1995CzZZ](#): ¹⁰⁴Sr produced in Pb(²³⁸U,F), E=750 MeV/nucleon identification by time-of-flight.

[2011Ni01](#): ¹⁰⁴Sr nuclide produced in Be(²³⁸U,F) reactions at E=345 MeV/nucleon produced by the cascade operation of the RBIF-RIKEN accelerator complex. Target=550 mg/cm². Identification of ¹⁰⁵Sr made on the basis of magnetic rigidity, time-of-flight and energy loss. The separated nuclei were implanted in a nine-layer double-sided silicon-strip detector (DSSSD). Correlations were recorded between the heavy ions and β rays. The half-life of ¹⁰⁴Sr isotope was measured from the correlated ion- β decay curves and maximum likelihood analysis technique. In the analysis of the decay curve, β -detection efficiency, background rate, daughter and granddaughter (including those populated in delayed neutron decays) half-lives, and β -delayed neutron emission probabilities were considered. Comparison of measured half-lives with FRDM+QRPA and KTUY+GT2 calculations.

[2015Lo04](#): ¹⁰⁴Sr nuclide produced at RIBF-RIKEN facility in ⁹Be(²³⁸U,F) reaction at E=345 MeV/nucleon with an average intensity of 6×10^{10} ions/s. Identification of ¹⁰⁴Sr was made by determining atomic Z and mass-to-charge ratio A/Q, where Q=charge state of the ions. The selectivity of ions was based on magnetic rigidity, time-of-flight and energy loss. The separated nuclei were implanted at a rate of 50 ions/s in a stack of eight double-sided silicon-strip detector (WAS3ABi), surrounded by EURICA array of 84 HPGe detectors. Correlations were recorded between the implanted ions and β rays. The half-life of ¹⁰⁴Sr isotope was measured from the correlated ion- β decay curves and maximum likelihood analysis technique as described in [2014Xu07](#). Comparison of measured half-lives with FRDM+QRPA, KTUY+GT2 and DF3+QORPA theoretical calculations.

Theoretical calculations:

[2013Fa05](#): calculated half-lives, delayed neutron emission probabilities.

[2009Ch42](#): calculated yrast spectra, B(E2), quadrupole deformation.

[2002Xu02](#): calculated levels, deformations, possible isomeric states.

[1985Ca33](#): calculated levels, B(E2) ratios.

[Additional information 1](#).

[1979Bu20](#): calculated potential energy surfaces; deduced ground-state equilibrium deformation.

¹⁰⁴Sr Levels

E(level)	J ^{π}	T _{1/2}	Comments
0	0 ⁺	53 ms 5	$\% \beta^- = 100$; $\% \beta^- n = ?$; $\% \beta^- 2n = ?$ Theoretical $\% \beta^- n = 9.2$, $\% \beta^- 2n = 0.0$ (1997Mo25). Measured $\sigma = 15$ pb (2010Oh02), systematic uncertainty $\approx 40\%$. Probability of misidentification of ¹⁰⁶ Sr isotope $< 0.001\%$ (2010Oh02). T _{1/2} : measured by 2015Lo04 from (implanted ions) β correlated curves in time and position using maximum likelihood method. Other: 43 ms +9-7 (2011Ni01 , same lab as 2015Lo04). See 2015Lo04 for comparison of their experimental value with several theoretical calculations.