

Adopted Levels

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	ENSDF	20-Jul-2015

$Q(\beta^-)=10750$ SY; $S(n)=5130$ SY; $S(p)=19140$ CA; $Q(\alpha)=-13040$ CA [2012Wa38,1997Mo25](#)

Estimated uncertainties ([2012Wa38](#)): 720 for $Q(\beta^-)$, 780 for $S(n)$.

$Q(\beta^-)$ and $S(n)$ from [2012Wa38](#); $S(p)$ and $Q(\alpha)$ from theory ([1997Mo25](#)).

$S(2n)=8150$ 780, $Q(\beta^-n)=7020$ 720. $S(2p)=35040$ ([1997Mo25](#),theory).

[2010Oh02](#): ^{124}Ru nuclide identified in $\text{Be}(^{238}\text{U},\text{F})$ and $\text{Pb}(^{238}\text{U},\text{F})$ reactions with a $^{238}\text{U}^{86+}$ beam energy of 345 MeV/nucleon produced by the cascade operation of the RBIF accelerator complex of the linear accelerator RILAC and four cyclotrons RRC, fRC, IRC and SRC. Identification of ^{124}Ru nuclei was made on the basis of magnetic rigidity, time-of-flight and energy loss of the fragments using BigRIPS fragment separator. Experiments performed at RIKEN facility. Based on A/Q spectrum and Z versus A/Q plot, one count was assigned to ^{124}Ru isotope. (Q=charge state).

[2015Lo04](#): ^{124}Ru nuclide produced at RIBF-RIKEN facility in $^9\text{Be}(^{238}\text{U},\text{F})$ reaction at $E=345$ MeV/nucleon with an average intensity of 6×10^{10} ions/s. Identification of ^{124}Ru 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 ^{124}Ru 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+CQRPA theoretical calculations.

[2013Fa08](#): theoretical calculations of $T_{1/2}$ and $\% \beta^-n$.

[2010No01](#): calculated potential energy surface, levels, $S(2n)$, $B(E2)$.

[Additional information 1](#).

 ^{124}Ru Levels

E(level)	J^π	$T_{1/2}$	Comments
0	0^+	15 ms 3	$\% \beta^- = 100$; $\% \beta^-n = ?$; $\% \beta^-2n = ?$ Theoretical $T_{1/2}=45.0$ ms, $\% \beta^-n=15.8$, $\% \beta^-2n=0.0$ (2003Mo09). Measured $\sigma=0.6$ pb (2010Oh02), systematic uncertainty $\approx 40\%$. Probability of misidentification of ^{124}Ru isotope $< 0.001\%$ (2010Oh02). $T_{1/2}$: measured by 2015Lo04 from (implanted ions) β correlated curves in time and position using maximum likelihood method. See 2015Lo04 for comparison of their experimental value with theoretical values.