

Adopted Levels

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jun Chen	NDS 174, 1 (2021)	15-Apr-2021

$Q(\beta^-)=12640$ SY; $S(n)=2840$ SY; $S(p)=17530$ SY; $Q(\alpha)=-12400$ SY [2021Wa16](#)

$\Delta Q(\beta^-)=640$, $\Delta S(n)=710$, $\Delta S(p)=580$, $\Delta Q(\alpha)=580$ (syst,[2021Wa16](#)).

$S(2n)=8070$ 640, $Q(\beta^-n)=7260$ 580 (syst,[2021Wa16](#)).

[2010Oh02](#): ^{123}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 RIBF accelerator complex of the linear accelerator RILAC and four cyclotrons RRC, fRC, IRC and SRC. Identification of ^{123}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, three counts were assigned to ^{123}Ru isotope. (Q=charge state).

[2015Lo04](#): ^{123}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 ^{123}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 ^{123}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.

Structure calculations: [2019Mo01](#), [2017El01](#), [2017Ko24](#), [2016Ma12](#), [2015Sa14](#), [2013Fa08](#), [2003Mo09](#), [1997Bo24](#), [1997Mo25](#).

[Additional information 1](#).

 ^{123}Ru Levels

E(level)	$T_{1/2}$	Comments
0	19 ms 2	$\% \beta^- = 100$; $\% \beta^- n = ?$; $\% \beta^- 2n = ?$ E(level): measured half-life is assumed to correspond to the ground state of ^{123}Ru . J^π : $3/2^+$ from systematics (2021Ko07 : NUBASE2020) and $1/2^-$ in theoretical calculations (2019Mo01). $T_{1/2}$: 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. Theoretical $T_{1/2}=52.1$ ms (2019Mo01), 33.4 ms (2016Ma12). Theoretical $\% \beta^- n=15$, $\% \beta^- 2n=0.0$ (2019Mo01); $\% \beta^- n=2.5$, $\% \beta^- 2n=0.3$ (2016Ma12). Measured $\sigma=2$ pb (2010Oh02), systematic uncertainty $\approx 40\%$. Probability of misidentification of ^{123}Ru isotope $<0.001\%$ (2010Oh02).