## Adopted Levels

| History | | | |
|---|---|---|---|
| Type | Author | Citation | Literature Cutoff Date |
| Full Evaluation | Balraj Singh | ENSDF | 30-Jun-2017 |

Q($\beta^-$)=8800 *SY*; S(n)=5520 *SY*; S(p)=16930 *CA*; Q($\alpha$)=−10940 *CA* 2017Wa10
Estimated uncertainties (2017Wa10): 450 for Q($\beta^-$), 500 for S(n), 640 for S(p) and Q($\alpha$).
S(2n)=8900 *450*, S(2p)=31960 *640*, Q($\beta^-$n)=4740 *400* (syst,2017Wa10).

2010Oh02: $^{120}$Ru nuclide produced and identified in Be($^{238}$U,F) and Pb($^{238}$U,F) reactions with a $^{238}U^{86+}$ 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 $^{120}$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, confirmed assignment to $^{120}$Ru isotope can be made for the first time. (Q=charge state).

2015Lo04: $^{120}$Ru nuclide produced at RIBF-RIKEN facility in $^{9}$Be($^{238}$U,F) reaction at E=345 MeV/nucleon with an average intensity of $6\times10^{10}$ ions/s. Identification of $^{120}$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 $\beta$ rays. The half-life of $^{120}$Ru isotope was measured from the correlated ion-$\beta$ 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.

1995CzZZ (short conference paper): possible identification of $^{120}$Ru in $^{9}$Be($^{238}$U,f) at 750 MeV/nucleon at GSI facility. But in subsequent published works (1997Be70,1998Do08) by the same group, there was no mention of the formation or identification of the $^{120}$Ru isotope; the heaviest Ru isotope identified was $^{119}$Ru in 1997Be70 and $^{117}$Ru in 1998Do08 (where a Pb target was used instead of Be). In 1995CzZZ, there was no detailed discussion about the formation of new isotopes, $^{120}$Ru was simply shown in the chart of nuclides figure 2 in their paper. In the absence of sufficient confirmatory evidence from the same experimental group (1994Be24,1995CzZZ,1997Be70,1998Do08), the identification of $^{120}$Ru remained uncertain until the work by 2010Oh02, where Fig. 2b clearly shows a prominent peak assigned to $^{120}$Ru isotope.

@B@0@0@@@@ @B@0@1@@@@@1 moments.

1980Va15: calculated levels, B(E2), magnetic dipole and electric quadrupole moments, S(2n), rms radius.

### $^{120}$Ru Levels

| E(level) | $J^\pi$ | $T_{1/2}$ | Comments |
|---|---|---|---|
| 0 | $0^+$ | 45 ms *2* | %$\beta^-$=100; %$\beta^-$n=?<br>Theoretical $T_{1/2}$=107.9 ms, %$\beta^-$n=3.4 (2003Mo09).<br>Theoretical $T_{1/2}$=71 ms, %$\beta^-$n=0.9 (2016Ma12).<br>$T_{1/2}$: measured by 2015Lo04 from (implanted ions)$\beta$ correlated curves in time and position using maximum likelihood method. See 2015Lo04 for comparison of their experimental value with theoretical values. |