Adopted Levels

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 170, 1 (2020)	16-Aug-2020

Q(β^-)=9590 *SY*; S(n)=2830 *SY*; S(p)=14830 *SY* 2017Wa10

Estimated uncertainties (2017Wa10): ΔQ(β^-)=500, ΔS(n)=570, ΔS(p)=640.

S(2n)=7640 *570*, Q(β^-n)=4750 *500*, from 2017Wa10 (based on syst).

Data set first introduced in ENSDF database by F.G. Kondev based on the XUNDL compilation of 2017Wu04 also done by F.G. Kondev (ANL) (including *Supplemental Material* table of 94 measured β-decay half-lives).

2018Sh11 and 2018Fu08 compiled for XUNDL database by B. Singh (McMaster).

2017Wu04, 2020Wu04: ^{153}Ba nuclide produced at the RIBF-RIKEN facility using the ^{9}Be(^{238}U,F) reaction at E=345 MeV/nucleon. Identification of the nuclide of interest was made in the BigRIPS separator by determining the atomic number and the mass-to-charge ratio of the ion using the tof-Bρ-ΔE method. Reaction products were transported through the ZeroDegree Spectrometer and implanted into the beta-counting system WAS3ABi that was surrounded by the EURICA array of 84 HPGe detectors. The typical implantation rate was about 100 ions/s. Measured: implanted ion-β^--t, implanted ion-β^--γ-t and implanted ions-γ-t correlations. Deduced: $T_{1/2}$.

2017Wu04 gave the first positive identification of ^{153}Ba nuclide and $T_{1/2}$ measurement. 2020Wu04 (same group) reconfirm ^{153}Ba production and retrieve consistent $T_{1/2}$ value at higher uncertainty.

2018Sh11, 2018Fu08: ^{153}Ba nuclide produced at the RIBF-RIKEN facility using the ^{9}Be(^{238}U,F) reaction at E=345 MeV/nucleon. Target=^{9}Be with a thickness of 2.92 mm. Nuclidic identification (PID) was made by determining the atomic number Z and mass-to-charge (A/Q) ratio of the ions using magnetic rigidity, time-of-flight, and energy loss (tof-Bρ-ΔE method) using the BigRIPS fragment separator. Time-of-flight measured with thin plastic scintillators placed at foci of the BigRIPS. The Bρ values were deduced from trajectory reconstruction of measured position and angle of fragments at each focus using parallel plate avalanche counters (PPACs). The ΔE values were measured using multisampling ionization chambers (MUSICs). Two HPGe clovers were used for isomer tagging by detecting delayed gamma rays from known μs isomers in fission fragments. The separated ions were then transported to the EURICA setup, where decay measurements were made through the ZeroDegree spectrometer. Comparison of measured cross sections with theoretical calculations using LISE$^+$ abrasion-fission (AF) model.

2018Sh11 assigned 81 counts to ^{153}Ba with production σ=54 pb (spectrometer setting on Te, 50% systematic uncertainty and probability of misidentification for this isotope <0.01%). 2018Fu08 reported 40 counts with production σ=61 pb *+19−15* (spectrometer setting on Pr, 50% systematic uncertainty).

^{153}Ba Levels

E(level)	$T_{1/2}$	Comments
0.0	0.116 s *52*	%β^-=100; %β^-n=? %β^-: Only β^- decay mode is expected. $T_{1/2}$: From 2017Wu04 fit to the implanted ion-β^--t spectrum using the least-squares and maximum-likelihood methods. Other: 0.109 s *59* (2020Wu04), same basic method. Data analysis included contributions from the parent, daughter and grand-daughter decays, as well as a constant background.