Adopted Levels

History			
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Filip G Kondev	ENSDF	20-Feb-2017

Q(β^-)=5.84×10^3 *3*; S(n)=4.06×10^3 *20*; S(p)=12183 (syst) *202*; Q(α)=−3977 (syst) *202* 2017Wa10
S(2n)=1.032×10^4 *20*; S(2p)=23259 (syst) *202* 2017Wa10

Additional information 1.

2012Ku26: ^{157}Nd produced and identified in ^{9}Be(^{238}U,F), E=1 GeV/nucleon reaction using SIS-18 synchrotron facility at GSI. Target=1.6 g/cm^2 ^{9}Be placed at the entrance of projectile Fragment Separator (FRS). Particle identification was achieved by event-by-event in-flight analysis of time-of-flight, energy loss measurement, and magnetic rigidity (tof-$\Delta E'$-Bρ). Time-of-flight measured using two plastic scintillation detectors, energy loss or deposit by ionization chambers (MUSIC), and magnetic rigidity by four time-projection chambers (TPC), which also provided energy deposit information. Isomer tagging method for known μs isomers was used to verify event-by-event identification and in-flight separation of new isotopes. Gamma rays from the known isomers were recorded in coincidence with the incoming ions using either the RISING array of Ge detectors at GSI or only two Ge detectors, a stopper foil and a scintillator for veto signal. Measured production cross section. Comparison of measured σ with predictions from ABRABLA model and EPAX-3 model.

2017Wu04: The ^{157}Nd nuclide was produced at the RIBF-RIKEN facility using the ^{9}Be(^{238}U,F) reaction at E=345 MeV/nucleon. Two experiments, optimized for the transmission of ^{158}Nd and ^{170}Dy ions, were carried out with average beam intensities of 7 pnA and 12 pnA, respectively. The 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. The reaction products were transported through the ZeroDegree Spectrometer and implanted into the beta-counting system WAS3ABi that was surrounded by the EURICA array comprising of 84 HPGe detectors. The typical implantation rate was 100 ions/s. Measured: implanted ion-β^--t, implanted ion-β^--γ-t and implanted ions-γ-t correlations. Deduced: $T_{1/2}$.

2012Va02: Penning-trap mass measurement using mass-separated fragments from the ^{252}Cf source at the CARIBU-ANL facility.

Earlier secondary reports for possible identification of the ^{157}Nd isotope:

1992ShZG: tentative identification of ^{157}Nd in the decay of a mass separated sample. Authors observed Pm K x rays and γ rays with $T_{1/2}$ of several seconds, which they tentatively identified as from the decay of ^{157}Nd.

1997Be12, 1995CzZZ: Pb(^{238}U,X),E=750 MeV/nucleon by SIS synchrotron at GSI using FRS separator at an experiment run in 1992. These reports seem to suggest observing ^{157}Nd, but no experimental details, such as production cross section or A/Z fragment yield plots, were given. The production of ^{157}Nd was not mentioned in any of the regular publications of the GSI group (1994Be24, 1997Be70, 2003Be45, 2007Pe01).

^{157}Nd Levels

E(level)	J$^\pi$	$T_{1/2}$	Comments
0.0	(5/2$^-$)	1.15 s *3*	%β^-=100 %β^-: Only β^- decay mode is expected. J$^\pi$: From systematics of known quasiparticle states in neighboring nuclei and the proposed configuration (by the evaluator). The assignment is tentative. $T_{1/2}$: From 2017Wu04, using a fit to the implanted ion-β^--t spectrum using the least-squares and maximum-likelihood methods. The data analysis included contributions from the parent, daughter and grand-daughter decays, as well as a constant background. configuration: ν5/2[523] Nilsson orbital, based on systematics of known structures in neighboring, well-deformed nuclei (by the evaluator). The assignment is tentative. Production σ(at 1 GeV/nucleon)=980 nb *40* (2012Ku26).