Adopted Levels

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Michael Birch	ENSDF	15-May-2011

Q(β^-)=5.6×10^3 *syst*; S(n)=3.5×10^3 *syst*; S(p)=6.7×10^3 *syst*; Q(α)=3.7×10^3 *syst* 2012Wa38
Note: Current evaluation has used the following Q record $ 5400 syst 3760 syst 7130 syst 3520 syst 2011AuZZ.
Estimated uncertainties in 2011AuZZ: 280 for Q(β^-) and S(n) 450 for S(p), 360 for Q(α).
S(2n)=8660 *410* (syst,2011AuZZ), S(2p)=17260 (1997Mo25,calculated).
2010Al24: ^{220}Bi nuclide identified in ^{9}Be(^{238}U,X) reaction with a beam energy of 1 GeV/nucleon produced by the SIS synchrotron at GSI facility. Target=2500 mg/cm^2. The fragment residues were analyzed with the high resolving power magnetic spectrometer Fragment separator (FRS). The identification of nuclei was made on the basis of magnetic rigidity, velocity, time-of-flight, energy loss and atomic number of the fragments using two plastic scintillators and two multisampling ionization chambers. The FRS magnet was tuned to center on ^{210}Au, ^{216}Pb, ^{219}Pb, ^{227}At and ^{229}At nuclei along the central trajectory of FRS.
Unambiguous identification of nuclides required the separation of different charge states of the nuclei passing through the FRS. At 1 GeV/nucleon incident energy of ^{238}U, fraction of fully stripped ^{226}Po nuclei was about 89%. Through the measurement of difference in magnetic rigidity in the two sections of the FRS and the difference in energy loss in the two ionization chambers, the charge state of the transmitted nuclei was determined, especially, that of the singly charged (hydrogen-like) nuclei which preserved their charge in the current experimental setup. Measured production cross sections with 10% statistical and 20% systematic uncertainties.
Criterion established in 2010Al24 for acceptance of identification of a new nuclide: 1. number of events should be compatible with the corresponding mass and atomic number located in the expected range of positions at both image planes of the FRS spectrometer; 2. number of events should be compatible with >95% probability that at least one of the counts does not correspond to a charge-state contaminant. Comparisons of measured σ with model predictions using the computer codes COFRA and EPAX. See also previous report 2009Al32 by the same group as 2010Al24.
structure calculations:
2009Go27: used the statistical approach and the combined dynamical statistical approach to calculate fission rate, and dependence of fission probability and average prescission multiplicities of neutrons, protons and α particles during the fission process.
2003Bo06: Calculated $T_{1/2}$ using shell model and quasiparticle RPA.
2003Bo48: Used microscopic models to calculate $T_{1/2}$.

^{220}Bi Levels

E(level)	$T_{1/2}$	Comments
0	>300 ns	%β^-=? Production σ=28.2 nb (from e-mail reply of Oct 29, 2010 from H. Alvarez-Pol, which also stated that further analysis was in progress). From A/Z plot (figure 1 in 2010Al24), a large number (certainly more than few hundreds) of events are assigned to ^{220}Bi. E(level): the observed fragments are assumed to be in the ground state of ^{220}Bi nuclei. The β^- decay is the only decay mode expected. $T_{1/2}$: lower limit from time-of-flight as given in 2006Ca30 for a similar setup. Actual half-life is expected to be much larger as suggested by the calculated value of 7.7 s for β decay and >10^{20} s for α decay (1997Mo25), and systematic value of 7 s for β decay (2011AuZY). J$^\pi$: 1/2 for proton and 7/2 neutron configuration predicted in 1997Mo25 calculations; 1$^-$ from systematics (2011AuZY). Production cross section measured in 2010Al24, values are given in figure 2, plot of σ versus mass number for Bi isotopes. Statistical uncertainty=10%, systematic uncertainty=20%.