Si(P,^{20}Mg) 2014Ga20

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	J. H. Kelley, G. C. Sheu	ENSDF	20-June-2019

2014Ga20: The mass of ^{20}Mg was measured using a Penning trap. Beams of ^{20,21}Mg ions were produced via 480 MeV proton spallation on a SiC target and separately transported to the TRIUMF/TITAN system. The cyclotron frequency was determined relative to a ^{23}Na reference. The mass excess of 17477.7 keV *18* was deduced, which compares relatively poorly with the value given in AME2012 (17559 keV *27*). In addition, the IMME parameters were discussed.

2016Lu13: XUNDL dataset compiled by TUNL, 2017.

A pulsed beam of 30 keV ^{20}Mg ions was produced at the CERN/ISOLDE facility using standard spallation techniques. The beam was magnetically purified, for mass separation, and implanted in a 24.5 μg/cm^2 carbon foil. The foil was surrounded by an array of four position sensitive ΔE-E Si detector telescopes that were placed at $\theta\approx\pm45^\circ$ and $\pm135^\circ$ in the horizontal plane. The 5 cm × 5 cm ΔE detectors each covered about 5.2% of 4π. A thick position sensitive E detector covered the region below the implantation foil while the target apparatus occupied the space above. In addition, a set of four clover segmented HPGe detectors were positioned downstream of the target, to measure decay γ rays.

The decay paths and branching intensities are determined from analysis of the p+γ coincidences for proton decays to ^{19}Ne*(0,235,275,1508,1536). The ^{20}Na energies are deduced using the measured γ ray and proton energies and the known S_p=2190.1 keV *11*. The ^{20}Mg half-life, T=91.4 ms *10*, was deduced from analysis of the delayed proton events.

^{20}Mg Levels

E(level)	$T_{1/2}$	Comments
0	91.4 ms *10*	The cyclotron frequency was determined relative to a ^{23}Na reference, and the mass excess of 17477.7 keV *18* was deduced. $T_{1/2}$: From (2016Lu13).