^{20}C β^-n decay 1989Le16,2003Yo02

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	G. C. Sheu, J. H. Kelley	ENSDF	06-Nov-2018

Parent: ^{20}C: E=0; $J^\pi=0^+$; $T_{1/2}$=16.3 ms *+40−35*; Q(β^-n)=1.358×10^4 *23*; %β^-n decay=65 *19*

^{20}C-$T_{1/2}$: from weighted average of (1989Le16,1990Mu06,2003Yo02 and P.L. Reeder et al., Int. Conf. on Nucl. Data for Science and Technology, May 9-13, 1994, Gatlinburg, Tennessee).

^{20}C-Q(β^-n): from (2017Wa10).

1989Le16,1990Mu06: ^{20}C particles were filtered using magnetic analysis in the LISE spectrometer and identified with energy loss and ToF measurements. The fragments were implanted in a Si detector surrounded by a plastic scintillator for β-ray detection. The target was placed inside a 4π neutron detector that had a neutron energy threshold of 350 keV. The ^{20}C $T_{1/2}$ reported in this work was 16 ms *+14−7* and P_n=(50 *30*)% was determined; values of $T_{1/2}$=14 ms *+6−5* and P_n=(72 *14*)%, which are apparently revised, were published in (1990Mu06). See also (1989MuZU).

2003Yo02: ^{20}C ions were produced at the RIKEN/RIPS facility and implanted a plastic scintillator detector. An array of 13 liquid scintillator detectors surrounded the implantation target. Following implantation, β and β+n coincidence counting were carried out for 100 ms (to permit decay of daughter & grandaughter activity). Standard pulse shape analysis was used to identify high-energy neutrons, while for 50 keV≤E_{eq}≤200 keV the time of flight information was used to separate neutrons and γ rays. Analysis of the 1n- and 2n- coincidence events yielded values of P_{1n}=(65 *+19−18*)% and P_{2n}<18.6%. $T_{1/2}=21.8^{+15.0}_{-7.4}$ ms was also measured.

In summary, $T_{1/2}$=14 ms *+6−5* (1990Mu06) appears most reliable. In (2003Yo02), limited statistics on ^{20}C were obtained since it was a contaminant to their beams of interest. The measured P_{1n} and P_{2n} values are consistent with the P_n values deduced in (1989Le16,1990Mu06), hence P_{1n}=(65 *+19−18*)% and P_{2n}<18.6% are accepted; this implies %β-0n≈35 *20*. No information on neutron-emission energies is given, but P_{1n}=(65 *+19−18*)% implies that $^{19}N_{g.s.}$ will be fed (by some decay path) in a significant fraction of decays.

See also (1973To16).

^{19}N Levels

E(level)
0.0

Delayed Neutrons (^{19}N)

E(^{19}N)	I(n)†	Comments
0.0	65 *19*	I(n)=65 *+19−18*.

† Absolute intensity per 100 decays.