^{19}C β^- decay 1995Oz02

History

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

Parent: ^{19}C: E=0; $T_{1/2}$=46.3 ms *40*; Q(β^-)=1.656×10^4 *10*; %β^- decay=100.0

^{19}C-$T_{1/2}$: weighted value of (1988Du09,1995Oz02 and P.L. Reeder et al., Int. Conf. on Nucl. Data for Science and Technology, May 9-13, 1994, Gatlinburg, Tennessee).

^{19}C-Q(β^-): From (2017Wa10).

^{19}C-Q(β^-n)=1.123×10^4 keV *10* (2017Wa10).

1995Oz02: A beam of ^{19}C ions, produced by fragmenting a ^{22}Ne beam on a ^{9}Be target, was magnetically separated and degraded to lower energies before being stopped in a plastic scintillator. The implantation detector was sandwiched between four other scintillator detectors; a valid event required a coincidence between three ajacent detectors. Three neutron walls surrounded the implantation target and covered about 1.4 sr. The decay neutron energy was deduced by the time of flight between the implantation detector and the neutron wall detectors. The time-of-flight (tof) was calibrated by studying the decay of ^{17}N which has three visible known neutron groups. A set of two NaI detectors faced the target for use measuring γ-ray singles events and n-γ coincidence events.

The measured neutron spectrum shows several decay groups. A significant ^{17}B component was present in the beam, and its decay radiations presented a background that was analyzed and subtracted. The final analysis of the neutron energy spectrum revealed five neutron groups that are attributed to β delayed neutron decay of ^{19}C, or its daughter ^{19}N.

Throughout the experiment, ions were implanted for a 100 ms period followed by a 200 ms counting period; analysis of the time dependence for the neutron groups permitted assignment of four groups to decay of ^{19}C ($T_{1/2}$≈50 ms) and one group to decay of ^{19}N ($T_{1/2}$≈320 ms).

Four neutron groups at E_n=0.46, 1.01, 1.50 and 2.08 keV are observed; poor statistics prohibited full analysis of the E_n=2.08 MeV group. Three excited states of ^{19}N were deduced from these E_n energies. The results are presented by normalizing to %β^-1n=47% *3* from (1988Du09).

^{19}N Levels

E(level)	Comments
6400 *27*	From E_n=460 keV *10* (→^{18}N*(0.587 MeV)).
6508 *27*	From E_n=1010 keV *10* (→^{18}N*(0.115 MeV)).
7025 *33*	From E_n=1500 keV *20* (→^{18}N*(0.115 MeV)).

β^- radiations

E(decay)	E(level)	Iβ^-[†]	Log *ft*	Comments
(9.54×10^3 *11*)	7025	12.7 *15*	4.94 *8*	av Eβ=4531 *53*
(1.005×10^4 *10*)	6508	20.0 *16*	4.86 *7*	av Eβ=4788 *52*
(1.016×10^4 *10*)	6400	14.3 *20*	5.02 *8*	av Eβ=4841 *52*

[†] Absolute intensity per 100 decays.