## $^{9}$Be($^{20}$N,$^{19}$C$\gamma$) 2015Wh02

History

| Type | Author | Citation | Literature Cutoff Date |
|---|---|---|---|
| Full Evaluation | J. H. Kelley, G. C. Sheu | ENSDF | 23-March-2017 |

2015Wh02: The authors studied the magnetic response of the halo nucleus $^{19}$C by measuring the lifetime of the first excited state and deducing the B(M1) transition strength.

A beam of E($^{20}$N)=74 MeV/nucleon ions ($\Delta$p/p=2%), produced by fragmentation of $^{22}$Ne in a thick $^{9}$Be target at the NSCL, impinged on a 370 mg/cm$^2$ $^{9}$Be target that sometimes induced single proton knock-out reactions populating $^{19}$C*(209). The heavy $^{19}$C recoil was detected using the S800 focal plane detectors, while de-excitation $\gamma$-rays were detected using seven elements of the GRETINA array. The Doppler-shift of the de-excitation $\gamma$-rays was measured in two configurations: first with only the $^{9}$Be reaction target (v/c=0.36) located 13 cm upstream with respect to the center of the array and second with the reaction target at 15.5 cm upstream with respect to the center of the array and a 1527 mg/cm$^2$ thick Ta degrader located 5 cm downstream from the reaction target (v/c=0.32). In this arrangement, the GRETINA detectors were located at $\theta_{lab}$=40° and $\theta_{lab}$=65°.

### $^{19}$C Levels

| E(level) | J$^\pi$ | T$_{1/2}$ | Comments |
|---|---|---|---|
| 0 | 1/2$^+$ | | J$^\pi$: from 2001Ma08. |
| 209 *2* | (3/2$^+$) | 1.34 ns *10* | T$_{1/2}$: Analysis of the spectra using lineshape and recoil-distance techniques indicate T$_{mean}$=198 ns *10* and 190 ns *10* values, respectively (2015Wh02). Additional systematic uncertainties give final uncertainties of T$_{mean}$=198 ns *12* and 190 ns *13* for the two methods, respectively. The authors give a recommended value T$_{mean}$=194 ns *15*.<br>J$^\pi$: from 2015Wh02, based on the B(M1) value; E2 components are excluded and neglected. |

### $\gamma$($^{19}$C)

| E$_i$(level) | J$_i^\pi$ | E$_\gamma$ | I$_\gamma$ | E$_f$ | J$_f^\pi$ | Mult. | Comments |
|---|---|---|---|---|---|---|---|
| 209 | (3/2$^+$) | 209 *2* | 100 | 0 | 1/2$^+$ | M1 | B(M1)↓=0.00321 *25* (2015Wh02); B(M1)(W.u.)=0.00179 *14* (2015Wh02) |

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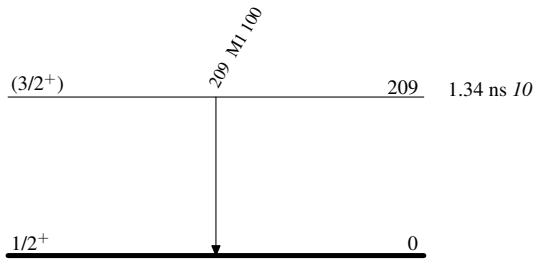
Level Scheme

Intensities: % photon branching from each level




$^{19}_{6}C_{13}$