^{12}C(^{22}C,^{19}B2n)   **2018Le18**

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	J. H. Kelley, G. C. Sheu	ENSDF	01-Jan-2019

2018Le18: XUNDL dataset compiled by TUNL, 2019.

A beam of $E_{effective}$=233 MeV/nucleon (target midpoint) ^{22}C ions, from the RIKEN/RIBF facility, impinged on a 1.8 g/cm^2 carbon slate that was located at the target position of the SAMURAI spectrometer. The ^{19}B reaction products were momentum analyzed using the SAMURAI focal plane, while the momentum of coincident neutrons were determined using the 120 module NEBULA plastic scintillator array. A prevalent peak near E(2n+^{19}B)≈2.5 MeV was observed in the relative energy spectrum, which was determined by analysis of invariant mass spectrum; note: the absence of ^{19}B excited states simplifies the analysis. This is the first observation of any ^{21}B resonance.

The peak was fit by assuming a Breit−Wigner shape, which resulted in a resonance with E(2n+^{19}B)=2.4 MeV 4 with Γ<3 MeV. The authors exploited a technique developed in (2016Ko11) that fitted the spectrum "with a combination of the uncorrelated distribution derived from event mixing and simulated events arising from the decay of a resonance in ^{21}B. The latter was assumed to occur by (decay into the) three-body phase space into $^{19}\beta^{+}$n+n, and E_{rel} was reconstructed between the fragment and the neutron with the shortest time of flight." This method yielded E(2n+^{19}B)=2.47 MeV 19 with Γ<0.6 MeV.

A comparison with Shell Model predictions suggest the ground state is formed via the removal of the $0p_{3/2}$ proton from ^{22}C, hence J^{π}=(3/2^{-}) is suggested.

^{21}B Levels

E(level)	J^{π}	Γ	Comments
0	(3/2^{-})	<600 keV	E(level): From E(2n+^{19}B)=2.47 MeV 19, which implies ΔM=78.38 MeV 40. J^{π}: From Shell Model systematics.