Adopted Levels 2018Le18

Q(β^-)=3.274×10^4 *72*; S(n)=−9.1×10^2 *55* 2017Wa10,2018Le18

Q(β^-),S(n): From $^{21}B_{g.s.}$=E_{res}(2n+^{19}B)=2.47 MeV *19*, which implies ΔM(^{21}B)=78.38 MeV *40* (2018Le18).

Predictions on the mass of ^{21}B are given in (2006KO02, 2012Yu07, 2017Wa10). Notably, (2017Wa10) had predicted ΔM=77.33 MeV *90*.

^{21}B Levels

Cross Reference (XREF) Flags

A	^{9}Be(^{40}Ar,X)
B	^{12}C(^{22}C,^{19}B2n)

E(level)	J^π	Γ	XREF	Comments
0	(3/2$^-$)	<600 keV	B	%2n≈100

^{9}Be(^{40}Ar,X) 2003Oz01

2003Oz01: Production yields for fragmentation of 94 MeV/nucleon ^{40}Ar projectiles were measured on berylium and tantalum targets at RIKEN/RIPS. No events were observed corresponding to ^{21}B, while 3 to 12 events were expected. Hence, $^{21}B_{g.s.}$ is neutron unbound.

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

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}B+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.

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