C(^{17}C,N15B) 2004Le29,2009Le02

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	J. H. Kelley, G. C. Sheu	ENSDF	16-Jan-2016

2004Le29, 2009Le02: Details on an experimental study of ^{16}B levels, populated in ^{17}C one-proton removal reactions, were first reported in (2004Le29) then later in (2009Le02). A 35 MeV/nucleon ^{17}C beam was selected using the GANIL/LISE3 fragment separator. The trajectory of the beam was measured as it impinged on a 95 mg/cm^2 ^{nat}C target. The reaction products were momentum analyzed by using either a position sensitive ΔE-ΔE-E (Si-Si-CsI) telescope (for charged particles) or the 97 element DEMON liquid scintillator neutron array.

The $^{15}\beta^+$n relative energy, with an estimated resolution of 100 keV FWHM, is best fit with a narrow peak, E_{res}=85 keV *15*, and a broad background component. The authors assume the decay populates $^{15}B_{g.s.}$ and that the peak then corresponds to $^{16}B_{g.s.}$. The observed width of the peak is similar to the experimental resolution; hence Γ<100 keV. The best fit utilizes Γ=0.5 keV.

The authors carried out a *s-p-sd-fp* shell model calculation to gain some insight into the expected J^π. Their analysis suggests the lowest states of ^{16}B should have, in order, J^π=0$^-$, 3$^-$, 2$^-$.

^{16}B Levels

E(level)	J^π	$T_{1/2}$	Comments
0.0	(0$^-$)	<100 keV	A resonance is observed at 85 keV *15* above the neutron+^{15}B threshold. The resonance has Γ<<100 keV and decays mainly via d-wave neutron emission. A fit shown in Fig. 3 of 2009Le02 uses resonance parameters E_{res}=85 keV *15* Γ=0.5 keV. It is also consistent with S_n=−40 keV *60* observed in 2000Ka21.