^{9}Be(^{9}C,^{9}C) 2017Br07

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	J. H. Kelley, B. Grees	ENSDF	31-July-2020

2017Br07: ^{9}Be(^{9}C,^{9}C) inelastic scattering to one- and two-proton unbound levels in ^{9}C using a 68 MeV/nucleon ^{9}C beam, from the MSU/A1900. The beam impinged on a 1 mm thick ^{9}Be target that was surrounded by the HiRA array, which comprised a set of 14 64 mm × 64 mm position sensitive ΔE-E telescopes that covered the forward direction of the outgoing beam ($\theta_{lab}\approx2°$ to 13.9°). The telescopes were arranged in vertical towers with a 2-3-4-3-2 configuration where the central tower had a gap between the upper and lower two telescopes to permit the beam a downstream exit at θ=0°. In addition, 158 CsI(Na) crystals from the CAESAR array covered polar angles between θ_{lab}=57.5° and 142.4° and measured the coincident γ-ray deexcitations.

Analysis of the p+^{8}B events revealed levels corresponding to decay of the known first and second excited states of ^{9}C to $^{8}B_{g.s.}$. Further analysis of the 2p+^{7}Be events revealed a broad asymmetric peak around E_x=5.5 MeV, which was found to include ^{9}C states at $E_x\approx$4.4 and 5.8 MeV that decay sequentially via ^{8}B states at E_x=0.77 and 2.32 MeV, respectively.

Finally, the authors evaluated the ^{9}C*(4.4,5.8) states along with ^{9}B*(19.25,20.42) states that they measured in ^{9}Be(^{9}C,^{9}B) reactions. Their analysis of the Coulomb-displacement energies suggests the claim that $^{9}C_{4.4}$-$^{9}B_{19.25}$ and $^{9}C_{5.8}$-$^{9}B_{20.42}$ are analog states.

^{9}C Levels

E(level)	J^{π}	Γ	Comments
2218[†] *11*	1/2^{-}[†]	52 keV *11*	T=3/2 Decays via p+$^{8}B_{g.s.}$
3549 *20*	5/2^{-}[‡]	673 keV *50*	T=3/2 Decays via p+$^{8}B_{g.s.}$
4400 *40*	(1/2^{+},5/2^{+})	2.75 MeV *11*	T=3/2 Decays via p+^{8}B*(770 keV: J^{π}=1^{+})→2p+^{7}Be. Shell model and R-matrix analysis of the Γ suggest J^{π}=(1/2^{+},5/2^{+}).
5750 *40*		601 keV *50*	T=3/2 Decays via p+^{8}B*(2320 keV: J^{π}=3^{+})→2p+^{7}Be.

[†] From (1974Be66).
[‡] From 2007Ro01.