An experiment to probe species generated within a supersonically-expanding jet consisting of SF$_6$, Ag, C$_2$H$_2$ and argon by broadband rotational spectroscopy revealed the existence of a T-shaped complex of hitherto unknown origin. Empirical tests revealed that this complex requires the presence of C$_2$H$_2$ and Ag within the gas sample. While the intensity of the associated transitions are enhanced by the presence of SF$_6$, theoretical calculations and empirical tests implied that the identified complex is H$_2$C$_2$···AgCCH rather than the original target of the experiment, H$_2$C$_2$···AgF. This deduction is now supported by evidence acquired through experiments exploiting $^{13}$C-enriched isotopic samples. Transitions have been assigned for the H$_2$$^{13}$C$_2$···Ag$^{13}$C$^{13}$CH isotopologue. Data acquired from each isotopologue allows determination of the rotational constants ($B_0$, $C_0$) and centrifugal distortion constant, $\Delta J$. The data are consistent with a T-shaped complex in which the Ag atom of AgCCH binds to electrons within the $\pi$-orbitals of ethyne. Preliminary determinations of bond lengths will be presented. Experiments are in progress to measure the spectra of deuterated isotopologues.