

MICROWAVE SPECTRA AND STRUCTURES OF $\text{H}_4\text{C}_2\cdots\text{AgCl}$ AND $\text{H}_4\text{C}_2\cdots\text{CuCl}$

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A Balle-Flygare FT-MW spectrometer coupled to a laser ablation source has been used to measure the pure rotational spectra of $\text{H}_4\text{C}_2\cdots\text{AgCl}$ and $\text{H}_4\text{C}_2\cdots\text{CuCl}$. Both molecules are generated via laser ablation (532 nm) of a metal rod in the presence of CCl_4 , C_2H_4 and argon and are stabilized by supersonic expansion. Rotational constants (A_0 , B_0 , C_0) and the centrifugal distortion constant, D_J , have been measured for six isotopologues of $\text{H}_4\text{C}_2\cdots\text{AgCl}$ and five isotopologues of $\text{H}_4\text{C}_2\cdots\text{CuCl}$ with substitutions at the metal, chlorine and carbon atoms in each case. The spectrum of each molecule is consistent with a C_{2v} structure in which the metal atom interacts with the π -orbital on ethene. The measured rotational constants allow determination of the length of the bond between the metal and chlorine atoms, r_{MCl} , and the distance between the metal atom and the centre of the ethene double bond, r_{MEt} . Nuclear quadrupole coupling constants have been determined for the chlorine atom in each molecule and also for copper in $\text{H}_4\text{C}_2\cdots\text{CuCl}$.