THE STUDY OF NOBLE GAS - NOBLE METAL HALIDE INTERACTIONS: FOURIER TRANSFORM MICROWAVE SPECTROSCOPY OF XeCuF

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High resolution Fourier transform microwave (FTMW) spectroscopy has been used to measure the rotational spectra of 7 isotopomers of the complex XeCuF. The molecules were prepared by laser ablation of Cu metal in the presence of xenon and SF_6. The resulting molecules were stabilized in a supersonic jet of Ar injected into the cavity of the FTMW spectrometer. The spectroscopic constants obtained include the rotational constants and centrifugal distortion constants (B_0, D_0). Nuclear quadrupole coupling constants obtained for Cu and ^{131}Xe indicate significant reorganization of the electron distribution on complex formation. The Xe-Cu distance obtained from the experimental data is small compared to the sum of the Xe van der Waals radius and the Cu^+ ionic radius. The nature of the Xe-CuF interaction will be discussed.