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 $^{132}$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.