MICROWAVE SPECTRA AND STRUCTURES OF $H_2O\cdots AgF$

S. L. STEPHENS, N. R. WALKER, D. P. TEW AND A. C. LEGON, *School of Chemistry, University of Bristol, Bristol, BS8 1TS, U.K.*

A Balle-Flygare FT-MW spectrometer coupled to a laser ablation source has been used to measure the pure rotational spectra of $H_2O\cdots AgF$. Generation is via laser ablation (532 nm) of a silver rod in the presence of SF_6, argon, a low partial pressure of H_2O and the molecules are stabilized by supersonic expansion. The spectra of eight isotopologues have been measured. Rotational constants, B_0 and C_0, and the centrifugal distortion constant, Δ_J have been determined. Isotopic substitutions are available at the silver, oxygen and hydrogen atoms. The spectra are consistent with a linear arrangement of oxygen, silver and fluorine atoms and the structure is either $C_{2\mathrm{v}}$ planar at equilibrium or C_{S} pyramidal but with a low potential-energy barrier to planarity such that the v = 0 and 1 states associated with the motion that inverts the configuration at the O atom are well separated.