ELECTRON SPIN RESONONANCE (ESR) STUDIES OF NEON MATRIX-ISOLATED $(HF)_2^-$ AND $(DF)_2^-$ DIMER RADICAL ANIONS: VALENCE OR DIPOLE-BOUND?

BEVAN ELLIOTT and LON B. KNIGHT, JR., *Department of Chemistry, Furman University, Greenville, SC 29613*.

Electron spin resonance (ESR) spectroscopic studies of the hydrogen halide dimer anion radicals $(HF)_2^-$ and $(DF)_2^-$ are presented. These paramagnetic species were created from the parent HF and DF gases using a rare gas microwave discharge, and trapped in neon matrices at 4 K. Whether the matrix-isolated radicals are conventional valence anions or have dipole-bound character is not fully known, but $(HF)_2^-$ exists in the gas phase only as a dipole bound anion. This study of the dimer anions represents the first observation of $(HF)_2^-$ outside the gas phase or isolated in any matrix, and the first observation of $(DF)_2^-$ by any means.