THE OPTICAL STARK SPECTRUM OF THE $A^3\Phi_4 - X^3\Phi_4$ BAND SYSTEM OF IRIDIUM MONOFLUORIDE, IrF

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Recently the New Brunswick group[a] reported on the field-free detection and analysis of the $A^3\Phi_4 - X^3\Phi_4$ band system of IrF. Here we report on the analysis Q(4)(15922 cm^{-1}) branch feature of the (1,0) band of the ^{191}IrF isotopologue of that system recorded at field strengths of up to 3000 V/cm. The spectra are surprisingly complex at the achieved resolution of 40 MHz due to the presence of both the ^{191}Ir(I=3/2) and ^{19}F(I=1/2) magnetic hyperfine splitting. The determined permanent electric dipole moment, μ_{el}, for the $X^3\Phi_4$ state is compared with that recently determined [b] for the $X^3\Phi_4$ state of isovalent CoF. The trend in μ_{el} amongst the ground states of IrF, IrC and IrN [c] will be discussed. Finally, a simple molecular orbital correlation diagram will be used to rationalize the change in μ_{el} upon excitation from the $X^3\Phi_4$ to $A^3\Phi_4$ state.

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[b] H. Wang; X. Zhaung; and T.C. Steimle *J. Chem. Phys.* **131** 114315, 2009.
[c] A.J.Marr; M.E. Flores; and T.C. Steimle *J. Chem. Phys.* **104** 8183, 1996.