DETECTION AND CHARACTERIZATION OF SCANDIUM IMIDE, ScNH

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Supersonic molecular beams of scandium imide, ScNH, and deuterated imide, ScND, were produced using a laser ablation/reaction source and interrogated by laser induced fluorescence and dispersed fluorescence spectroscopy. The fine and magnetic hyperfine interactions and Stark effect in the (0,0) $A^2\Pi_r$ - $X^2\Sigma^+$ transition of ScNH (origin = 15023.033 cm^{-1}) were analyzed. Ground state vibrational spacings for ScNH and ScND were measured. The determined permanent electric dipole moments are μ($A^2\Pi_r$) = 4.08(7)D and μ($X^2\Sigma^+$) = 2.28(15)D. The Sc $(I = \frac{7}{2})$ magnetic hyperfine structure was analyzed from which a plausible molecular orbital description was made. A comparision with experimental observations[a,b] and theoretical predictions[c] for YNH has been made.

[a] B. Simard, W.J. Balfour, M. Vasseur, and P.A. Hackett, J. Chem. Phys. **93**, 4481,(1990).
[b] *ibid* Presentation TC13 "45th Ohio State Symposium on Molecular Spectroscopy", June 11-15, 1990.
[c] K.K. Das and K. Balsubramanian,, J. Chem. Phys. **93**, 6671,(1990).