

## HIGH RESOLUTION LASER SPECTROSCOPY OF RHODIUM MONOCHLORIDE.

ALLAN G. ADAM and SCOTT A. SHEPARD, *Department of Chemistry, University of New Brunswick, Fredericton, NB, Canada E3B 6E2*; WALTER J. BALFOUR and RUNHUA LI, *Department of Chemistry, University of Victoria, Victoria, BC, Canada V8W 3V6*.

High resolution laser spectra of rhodium monochloride (RhCl) have been acquired in the green and blue regions of the visible spectrum. The molecules were produced via laser ablation of a rhodium target rod, followed by reaction with trichloromethane in a pulsed supersonic jet. Several electronic transitions have been observed and analysed between 19,700 and 23,100  $\text{cm}^{-1}$ . Two distinct lower state omega values have been determined:  $\Omega = 3$  which is consistent with the  $^3\Delta_3$  ground state observed for RhH and RhD<sup>a</sup>, and  $\Omega = 2$  which curiously enough seems to be the ground state of RhF<sup>b</sup>. As of yet, which  $\Omega$  value represents the ground state is unknown as transitions from either of these states seem equally intense. Dispersed fluorescence (DF) scans have been taken from a number of the observed excited states yielding an estimate of  $350 \pm 20 \text{ cm}^{-1}$  for a lower state vibrational frequency. The DF scans are also quite complicated indicating the presence of a number of low-lying states with energies less than  $3200 \text{ cm}^{-1}$  above the ground state. Work on the RhCl molecule is continuing and results will be discussed.

---

<sup>a</sup>W.J.Balfour, J. Cao, and C.X.W. Qian, *J. Mol. Spectrosc.* **201**, 244(2000)

<sup>b</sup>A.G. Adam, W.J. Balfour, R. Li, and S.A. Shepard, to be published