AXIS SWITCHING AND CORIOLIS COUPLING IN THE A-X TRANSITION OF DCCl AND HCCl

TREVOR J. SEARS, GREGORY E. HALL, KAORI KOBAYASHI, AO LIN, JAMES T. MUCKERMAN AND HUA-GEN YU, *Department of Chemistry, Brookhaven National Laboratory, Upton, NY 11973-5000*; ANTHONY J. MERER, *Department of Chemistry, University of Vancouver, 2036 Main Mall, Vancouver, BC V6T 1Z1, Canada*.

The rotationally resolved $\tilde{A}(010)$ - $\tilde{X}(000)$ spectrum of DCCl between 12880 and 12964 cm^{-1} was measured using frequency-modulated laser absorption spectroscopy of jet-cooled and ambient temperature samples. Transitions to levels with K'_a=0 and 1 were assigned, and their analysis leads to improved accuracy of both the ground state rotational constants of DCCl and, when combined with existing data for HCCl, the geometry of the radical. In addition to the expected perpendicular band structure, a number of parallel (ΔK_a=0) sub-bands were observed. Their intensity derives from a combination of c-type Coriolis coupling and axis-switching [J. T. Hougen and J. K. G. Watson, Can. J. Phys. **43**, 298 (1965)] resulting from the change in geometry bewteen the two states. The two contributions have been calculated for the (010)-(000) band of DCCl and previously recorded data for HCCl. Satisfactory agreement with experimental measurements was obtained. The Coriolis contributions are small for these bands, but may add to or subtract from the axis-switching. For transitions to levels with higher bending excitation in the excited state, Coriolis coupling is expected to make larger contributions to the parallel sub-band intensities.