

HYPERFINE STRUCTURE OF THE NEAR INFRARED TRANSITIONS OF CoI AND CoCl

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Electronic transition of cobalt monochloride and monoiodide have been studied using laser vaporization/reaction free jet expansion and laser induced fluorescence in the near infrared region. The observed transitions were characterized as the $[10.3] {}^3\Phi_4 - X^3\Phi_4$ transition of CoCl and the $[11.0] {}^3\Phi_4 - X^3\Phi_4$ transition of CoI. Magnetic hyperfine structure resulting from the cobalt nucleus with $I = 7/2$ have been observed and analyzed. Accurate rotational and hyperfine parameters for both of the upper and lower ${}^3\Phi_4$ states of CoCl and CoI have been determined. Comparison of Fermi contact parameter b_F for the upper states indicated that the observed transitions are arisen from the promotion of electron between $\sigma \rightarrow \sigma$ orbitals.