FOURIER TRANSFORM AND INTRACAVITY LASER SPECTROSCOPY OF NICKEL CHLORIDE: IDENTIFICATION OF THE X $^2\Pi_{1/2}$ STATE

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The near infrared electronic transition of NiCl occurring in the region of 11900 cm^{-1}, also known as System I, has been recorded with rotational resolution by Fourier transform emissions spectroscopy and intracavity laser absorption spectroscopy. This band has been identified as the [12.3] $^2\Sigma^+$ - X $^2\Pi_{1/2}$ transition. The molecular constants for the newly identified X $^2\Pi_{1/2}$ state are (in cm^{-1}): T_0=385.666(2), B_0=0.180778(2), D_0=1.652(3)x10^{-7}, p=0.8391(1), p_D=3.90(7)x10^{-6}. Results of the analysis will be discussed. The identification of the low-lying X $^2\Pi_{1/2}$ state completes the analyses of low-lying electronic states of NiCl that correlate to the Ni^+3d^9 electron configuration. Progress on using a 5x5 supermultiplet to describe the low-lying states of NiCl will be reported.