

THE $X^2\Pi_i$, $A^2\Delta_i$ AND $B^2\Sigma^+$ LOW-LYING STATES OF NiCl : LASER INDUCED AND FOURIER TRANSFORM EXPERIMENTS

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The $X^2\Pi_{3/2}$, $A^2\Delta_{5/2}$ (161 cm^{-1}) and $B^2\Sigma^+$ ($1,768\text{ cm}^{-1}$) low-lying states of NiCl have been recently identified. Transitions linking these states to upper $[21.9]^2\Delta_{5/2}$, $[24.5]^2\Pi_{3/2}$ and $[24.9]^2\Pi_{1/2}$ states have been rotationally analyzed. Laser induced fluorescence experiments allowed the identification of the $X^2\Pi_{1/2}$ (382 cm^{-1}) and $A^2\Delta_{3/2}$ ($1,646\text{ cm}^{-1}$) spin-orbit components. All the low-lying states of NiCl associated with the nickel $3d$ atomic orbital are now observed. In addition we identified a new electronic state located at $21,608\text{ cm}^{-1}$. This state is linked to all the five spin-orbit components of the X , A and B states. High resolution Fourier transform experiments made possible the analysis of three of these transitions. Laser induced dispersed fluorescence suggest that this state is also linked to a new low-lying state ($1,378\text{ cm}^{-1}$) which could be a component of a quartet state of NiCl.