PROBING THE ELECTRONIC STRUCTURE OF THE NICKEL MONOHALIDES: SPECTROSCOPY OF THE LOW-LYING ELECTRONIC STATES OF NiX (X=Cl,Br,I)

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Laser induced fluorescence and single vibronic level emission spectroscopy has been used to probe five low-lying electronic states ($X^2\Pi_{3/2}$, $A^2\Delta_{5/2}$, $X^2\Pi_{1/2}$, $A^2\Delta_{3/2}$ and $B^2\Sigma^+{}_{1/2}$) of NiX (X=Cl,Br,I) that arise from the $3d^9$ configuration of Ni^+. In this work, term energies and a complete set of vibrational parameters were derived for all five electronic states of the target molecules, and these are compared with recent high level ab initio calculations. Pertubations among these states were examined, and the data set derived in this work affords a detailed analysis of periodic trends in the Nickel monohalide series.