

## LASER SPECTROSCOPY OF NICKEL CYANIDE, NiCN, IN THE VISIBLE REGION

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The electronic spectrum of NiCN has been observed in the visible region following the reaction of laser-ablated nickel with either (CN)<sub>2</sub> or CH<sub>3</sub>CN under supersonic jet-cooled conditions. High resolution LIF experiments have shown that the ground state is  $^2\Delta_{5/2}$ , with  $B_0 = 0.1444334(30) \text{ cm}^{-1}$ ; using data taken with CH<sub>3</sub>C<sup>15</sup>N, the bond lengths are found to be  $r_0(\text{Ni-C}) = 1.8292(37) \text{ \AA}$  and  $r_0(\text{C-N}) = 1.1591(52) \text{ \AA}$ . The vibrational structure of the ground state is an excellent example of strong Fermi resonance. Four excited electronic states have been identified. They are assigned as  $\tilde{A}^2\Delta_{5/2}$  at  $16607 \text{ cm}^{-1}$ ,  $\tilde{B}^2\Pi_{3/2}$  at  $16686 \text{ cm}^{-1}$ ,  $\tilde{C}^2\Phi_{7/2}$  at  $17813 \text{ cm}^{-1}$  and  $\tilde{D}^2\Phi_{5/2}$  at  $19129 \text{ cm}^{-1}$ . The electronic structure of NiCN turns out to be remarkably similar to that of NiH<sup>a</sup>.

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<sup>a</sup>S.A. Kadavathu, R. Scullman, R.W. Field, J.A. Gray and M. Li, *J. Mol. Spectrosc.* **147**, 448 (1991)