Crystallographic and Spectroscopic Evidence of O-Bonding in 3d-Metal Dicyanomethanidonitrite Complexes

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Dicyanomethanidonitrite Complexes

The coordination of the dicyanomethanidonitrite group through the nitroso oxygen atom in the tetrakis(pyridine) complexes $[M\{ONC(CN)_2\}_2(py)_4]$, M = Ni, Co, Cu, and in the bis(pyridine) complex $[Cu\{ONC(CN)_2\}_2(py)_2]$ was proved by X-ray crystallography of the Ni^{II} complex and re-evaluated infrared spectra. The Ni^{II} and Co^{II} complexes exhibit almost octahedral structures composed of four pyridine nitrogen atoms and two oxygen atoms of dicyanomethanidonitrite ions. Both copper(II) complexes display a considerable axial distortion of the pseudooctahedral arrangement. In the bis(pyridine) Cu^{II} complex the $ONC(CN)_2$ groups are involved in the bridging function by use of the oxygen and nitrile nitrogen atoms.