

Synthesis, Structures, and Thermal and Magnetic Properties of New Coordination Polymers Based on Mn(II) and Ni(II) Thiocyanato Complexes with *trans*-1,2-Bis(4-pyridyl)ethylene as Ligand

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Hydrothermal reaction of manganese(II) thiocyanate with *trans*-1,2-bis(4-pyridyl)ethylene (bpe) in water leads to the formation of the new ligand-rich 1 : 3 (ratio metal/ligand) compound $[\text{Mn}(\text{NCS})_2(\text{bpe})_2 \cdot (\text{bpe})]$ (**1-Mn**). In the crystal structure the manganese cations are octahedrally coordinated by two thiocyanato anions and four bpe ligands and are linked into layers by the bpe ligands. Reaction of manganese(II) thiocyanate with bpe in water leads to the known 1 : 2 compound $\text{Mn}(\text{NCS})_2(\text{bpe})_2(\text{H}_2\text{O})_2$ (**2-Mn**). On heating compound **1-Mn** is transformed directly into a ligand-deficient 1 : 1 compound of composition $[\text{Mn}(\text{NCS})_2(\text{bpe})]_n$ (**4-Mn**), whereas on thermal decomposition of **2-Mn** a new 1 : 2 anhydrate of composition $[\text{Mn}(\text{NCS})_2(\text{bpe})_2]_n$ (**3-Mn**) can be isolated in the first step, which is transformed into **4-Mn** on further heating. In further experiments single crystals of the ligand-deficient compound **4-Mn** were also obtained. In its crystal structure the manganese cations are connected by the thiocyanato anions into $\text{Mn}(\text{NCS})_2\text{-Mn}$ double chains, which are further connected by bpe ligands into layers. In contrast, reaction of nickel(II) thiocyanate with bpe leads always to the formation of only one crystalline phase (**1-Ni**) that is isotypic to **4-Mn**. Magnetic measurements have revealed that all compounds show Curie or Curie-Weiss paramagnetism.

Key words: Thermal Decomposition, Magnetic Properties, *trans*-1,2-Bis(4-pyridyl)ethylene, Coordination Polymers, Manganese, Nickel