Synthesis, Crystal Structure and Thermal Decomposition Reaction of the New Copper(I) Cyanide Coordination Polymer Poly[tri-$\mu_2$-cyano-C,N]-bis($\mu_2$-2,3-dimethyl-pyrazine-N,N)]tricopper(I)

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The new copper(I) coordination polymer poly[tri-$\mu_2$-cyano-C,N]-bis($\mu_2$-2,3-dimethyl-pyrazine-N,N)]tricopper(I) (I) was prepared by the reaction of copper(I) cyanide with 2,3-dimethylpyrazine in acetonitrile. In the crystal structure of I a novel CuCN substructure is found which is connected by the dimethylpyrazine ligands into a three-dimensional coordination network. The thermal properties of I were investigated using simultaneous differential thermoanalysis (DTA), thermogravimetry (TG) and mass spectrometry (MS) as well as temperature resolved X-ray powder diffraction. On heating, compound I looses a part of the dimethylpyrazine ligands in an endothermic reaction to form the known ligand poor compound (CuCN)$_2$-(2,3-dimethylpyrazine) II as an intermediate which decomposes to CuCN on further heating.

Key words: Copper(I) Pseudohalide, Dimethylpyrazine, Coordination Polymers, Crystal Structure, Thermal Decomposition