

Synthesis, Crystal Structure and Thermal Properties of Silver(I) Bromide Ethylenediamine Coordination Polymers

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Z. Naturforsch. **59b**, 992 – 998 (2004); received July 7, 2004

Dedicated to Professor Kurt O. Klepp on the occasion of his 60th birthday

Reaction of silver(I) bromide with ethylenediamine (en) leads to the formation of the 1:1 compound poly[AgBr(μ_2 -en-N,N')] (**I**). In the crystal structure the silver atoms of AgBr dimers are connected to two bridging bromine atoms and two nitrogen atoms of different en ligands. The dimers are thus connected by the ligands into layers *via* μ -N,N' coordination. In the 2:1 coordination polymer poly[(AgBr)₂(μ_2 -en-N,N')] (**II**) a three-dimensional AgBr substructure occur which consists of helical AgBr chains that are connected *via* peripheral Ag-Br contacts into a three-dimensional network that contains large channels. The en ligands are situated in these channels bridging the Ag atoms. From solution this compound cannot be obtained as a pure phase, since compound **I** is always formed as the major phase. On heating the 1:1 compound **I** in a thermobalance the sample mass decreases slowly and several mass steps are observed, which are not fully resolved. If the reaction is stopped at 230 °C, pure AgBr has formed. At 115 °C only traces of compound **II** are found. The major phase consists of an as yet unidentified ligand poor compound.

Key words: Silver(I) Bromide, Ethylenediamine, Coordination Polymers, Crystal Structures, Thermal Properties