

Influence of Anions on the Self-assembly of Cd(II)-containing Coordination Polymers Based on the Flexible Ligand 2-((1*H*-1,2,4-Triazol-1-yl)methyl)-1*H*-benzimidazole

Guanghua Jin^a, Yang Yang^a, Xiaoli Zhou^b, and Xiangru Meng^a

^a Department of Chemistry, Zhengzhou University, Zhengzhou 450052, P. R. China

^b Experiment Administrative Center, Zhongzhou University, Zhengzhou 450044, P. R. China

Reprint requests to Prof. Xiangru Meng. Fax: +86-0371-67783126. E-mail: mxr@zzu.edu.cn

Z. Naturforsch. **2012**, *67b*, 29 – 35; received September 4, 2011

Three Cd(II)-containing coordination polymers $[\text{CdCl}_2(\text{tmb})]_n$ (**1**) and two polymorphs of $\{[\text{CdI}_2(\text{tmb})] \cdot \text{DMF}\}_n$ (**2**, **3**) (tmb = 2-((1*H*-1,2,4-triazol-1-yl)methyl)-1*H*-benzimidazole) have been synthesized by the reactions of tmb with the cadmium salts. Polymer **1** exhibits an infinite $\cdots\text{Cd}(\text{ClI})_2\text{-Cd}(\text{ClI})_2\text{-Cd}\cdots$ chain with $\mu_2\text{Cl}$ bridges, while polymers **2** and **3** are isomers, in which the Cd(II) ions are bridged by the bidentate tmb ligands leading to $\cdots\text{Cd-tmb-Cd}\cdots$ chains. The polymers form 3-D supramolecular frameworks through hydrogen bonds and $\pi \cdots \pi$ stacking interactions. The different structures of polymers **1**–**3** indicate that the anions and the flexibility of the tmb ligand can influence the structures of the coordination polymers. The infrared spectra and luminescent properties of the polymers have been investigated in the solid state at room temperature.

Key words: Crystal Structure, Anion Influence, Flexibility of Ligand, Luminescence