

# Tuning 1-D Pb(II) Coordination Polymers by Flexible and Semirigid Dicarboxylates: Synthesis, Structure and Properties

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Two new one-dimensional (1-D) Pb(II) coordination polymers, namely,  $[\text{Pb}(3\text{-pdip})(\text{L}^1)]\cdot\text{H}_2\text{O}$  (**1**) and  $[\text{Pb}(3\text{-pdip})(\text{L}^2)]$  (**2**) [ $\text{L}^1\text{H}_2 = 1,6\text{-hexanedioic acid}$ ,  $\text{L}^2\text{H}_2 = \text{homophthalic acid}$ ,  $3\text{-pdip} = 2\text{-}(3\text{-pyridyl})\text{imidazo}[4,5\text{-f}]1,10\text{-phenanthroline}$ ] have been obtained from hydrothermal reactions of Pb(II) nitrate with the phenanthroline derivative and the two dicarboxylic acids. Single-crystal X-ray diffraction analysis reveals that compound **1** is a staircase-like double-chain coordination polymer constructed from binuclear  $[\text{Pb}_2\text{N}_4\text{O}_8]$  subunits and pairs of  $[\text{L}^1]^{2-}$  anions. Compound **2** is a linear coordination polymer connected *via* two  $\mu_2\text{-}\eta^2:\eta^1$  carboxylate groups from  $[\text{L}^2]^{2-}$  anions. Furthermore, adjacent chains of **1** and **2** are extended into 3-D supramolecular networks by hydrogen bonds and  $\pi\text{-}\pi$  stacking interactions. The organic carboxylic acids with different flexibility determine the structures of the coordination polymers. Moreover, the thermal stabilities and photoluminescence properties of compounds **1** and **2** were investigated.

*Key words:* Hydrothermal Syntheses, Crystal Structures, Lead Coordination Polymers, Photoluminescence