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**Self-assembly of Zn/Cd-coordination polymers based on  
3,3',4,4'-biphenyltetracarboxylic acid and N-donor ligands and  
luminescence sensing of Fe<sup>3+</sup> ions**

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**Abstract:**

Two new d<sup>10</sup> configuration coordination polymers based on H<sub>4</sub>bpta (H<sub>4</sub>bpta = 3,3',4,4'-biphenyltetracarboxylic acid) and N-donor ligands, namely [Zn<sub>2</sub>(1,3-bimb)<sub>2</sub>(bpta)]<sub>n</sub> (**1**) and [Cd<sub>2</sub>(1,3-bimb)(bpta)(H<sub>2</sub>O)]<sub>n</sub>·0.5nH<sub>2</sub>O (**2**) (1,3-bimb = 1,3-bis((1H-imidazol-1-yl)methyl)benzene), have been obtained under solvothermal conditions. The bpta<sup>4-</sup> ligands show various coordination modes due to the different radiuses of metal ions in structures **1** and **2**. Compound **1** is a 3D network built up of 4-connected bpta<sup>4-</sup> and 1,3-bimb ligands bonding with Zn<sup>2+</sup> ions in monodentate modes. Compound **2** also exhibits a 3D structure formed through H<sub>4</sub>bpta and 1,3-bimb linkers cross-linking the [Cd<sub>3</sub>(μ-COO)<sub>2</sub>]<sup>2+</sup> secondary-building units (SBUs), in which the carboxylate groups can adopt three coordination modes with chelating, μ<sub>2</sub>-O and *syn-syn* bridging types. In addition, different 1D zigzag chains (–Zn–(1,3-bimb)–Zn– for **1**, and –Cd–(1,3-bimb)–Cd–(μ-O)–Cd– for **2**) are formed by the 1,3-bimb ligands with *trans*-conformation linking metal ions. The fluorescence properties of the free ligands, **1** and **2** have been investigated carefully, and compound **2** displays highly selective and sensitive sensing for Fe<sup>3+</sup> ions in DMF solution.

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