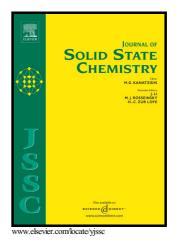
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 PII:
 S0022-4596(18)30374-8

 DOI:
 https://doi.org/10.1016/j.jssc.2018.09.002

 Reference:
 YJSSC20363

To appear in: Journal of Solid State Chemistry

Received date: 5 July 2018 Revised date: 29 August 2018 Accepted date: 1 September 2018

Cite this article as: Ling Ma, Yanyun Liu and Feng Su, Self-assembly of Zn/Cdcoordination polymers based on 3,3',4,4'-biphenyltetracarboxylic acid and Ndonor ligands and luminescence sensing of Fe³⁺ ions, *Journal of Solid State Chemistry*, https://doi.org/10.1016/j.jssc.2018.09.002

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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 Fe³⁺ ions

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Abstract:

Two new d^{10} configuration coordination polymers based on H₄bpta (H₄bpta = 3,3',4,4'-biphenyltetracarboxylic acid) N-donor ligands, and namely $[Zn_2(1,3-bimb)_2(bpta)]_n$ (1) and $[Cd_2(1,3-bimb)(bpta)(H_2O)]_n \cdot 0.5nH_2O$ (2) (1,3-bimb = 1,3-bis((1H-imidazol-1-yl)methyl)benzene), have been obtained under solvothermal conditions. The bpta⁴⁻ 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 bpta⁴⁻ and 1,3-bimb ligands bonding with Zn^{2+} ions in monodentate modes. Compound 2 also exhibits a 3D structure formed through H₄bpta and 1,3-bimb linkers cross-linking the $[Cd_3(\mu - COO)_2]^{2+}$ secondary-building units (SBUs), in which the carboxylate groups can adopt three coordination modes with chelating, μ_2 -O and syn-syn bridging types. In addition, different 1D zigzag chains (-Zn-(1,3-bimb)-Znfor 1, and $-Cd-(1,3-bimb)-Cd-(\mu-O)-Cd-$ 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^{3+} ions in DMF solution.

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