Title:	Coordination driven self-assembly of [2 + 2 + 2] molecular squares: synthesis, crystal structures, catalytic and luminescence properties
Authors:	Gupta, Vijay (/jspui/browse?type=author&value=Gupta%2C+Vijay) Mandal, S.K. (/jspui/browse?type=author&value=Mandal%2C+S.K.)
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Abstract:	The one-pot self-assembly of three components (metal acetates as the metal precursor, the tridentate polypyridyl ligand, N,N′-bis(2-pyridylmethyl)-tert-butylamine (bpta), as a capping ligand and bent dicarboxylic acids, 4,4′-(dimethylsilanediyl)bis-benzoic acid (H2L1) or 4,4′-oxybis-benzoic acid (H2L2), as bridging ligands) under ambient conditions has resulted in the formation of a series of discrete [2 + 2 + 2] molecular squares (1-10) of the general formula [M2(bpta)2L2(H2O)2], where M = Mn, Co, Ni, Zn or Cd and L = L1 or L2. In addition to their characterization by elemental analysis and FTIR spectroscopy, a combination of single crystal and powder X-ray diffraction confirmed their isostructural nature. Their chemical (towards various solvents) and thermal stabilities have been established by powder X-ray diffraction and thermogravimetric analysis (TGA), respectively. The presence of metal centers with coordinated water molecules has provided an opportunity for their use as an efficient Lewis acid catalyst for the Knoevenagel condensation reaction of malononitrile with various aldehydes (98-100% conversion in 100 minutes with 2 mol% catalyst in water). Furthermore, the blue emitting nature of 4 and 10 (M = Cd) was utilized for the selective detection of nitrobenzene via the fluorescence quenching mechanism involving host-guest interactions.
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