Title:	Non-hydrothermal synthesis, structural characterization and thermochemistry of water soluble and neutral coordination polymers of Zn(ii) and Cd(ii): precursors for the submicron-sized crystalline ZnO/CdO
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Abstract:	Eight new water soluble and neutral one-dimensional, V-shaped coordination polymers (CPs) of Zn(II) (1–4) and Cd(II) (5–8) with a general formula of {[M2(bpxa)2(adc)2]·xH2O}n (where M(II) = Zn(II) or Cd(II); bpxa = N,N-bis(pyridylmethyl)alkyl amine; adc = acetylene dicarboxylate; x = 0 or 2) are reported. These are synthesized in good yields from the self-assembly reaction of M(OAc)2 (where M = Zn or Cd), bpxa and the corresponding acid in methanol at ambient conditions. Based on the crystal structures of 1–3 and 6–8 by single crystal X-ray diffraction studies and a subtle change in the N-alkyl group in the tridentate ligands has provided structural diversity in these CPs with respect to binding differences of the adc linker and the presence (or absence) of π–π interactions as well as the presence (or absence) of lattice water molecules, which further shows hydrogen bonding interactions between the CP chains forming supramolecular networks. These features are unique for the CPs reported in this work. All these CPs are characterized by elemental analysis and FTIR spectroscopy. The thermal stabilities of these CPs are studied by thermogravimetric analysis and variable temperature (−100 °C to +150 °C) PXRD experiments. For a proof of concept, using field-emission scanning electron microscopy (FESEM) and X-ray energy dispersive spectroscopy (EDS), one CP of each metal (3 and 7, respectively) has been shown to be a suitable precursor for generating submicron-sized crystalline ZnO or CdO at 400 °C or 250 °C, respectively. Some of the CPs were also studied for their photoluminescence properties in the solid state at room temperature.
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