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Title:	Synthesis and structural characterization of Zn(II) and Cd(II) ion directed coordination networks and their template-free fabrication to metal oxide nanomaterials
Authors:	Thakur, Smriti (/jspui/browse?type=author&value=Thakur%2C+Smriti) Mandal, S.K. (/jspui/browse?type=author&value=Mandal%2C+S.K.)
Keywords:	Coordination networks Water-soluble ZnO and CdO nanoparticles Thermal decomposition
Issue Date:	2020
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Abstract:	Using a tetradentate capping ligand, N,N,N-tris(2-pyridylmethyl)-amine (tpa) and acetylene dicarboxylic acid (H ₂ adc), structural diversity is achieved with two group 12 divalent metal ions, Zn(II) and Cd(II). With a change in metal center, a discrete molecule [Zn ₂ (tpa) ₂ (adc) ₂ ·5H ₂ O (1) and a water soluble coordination polymer [Cd(tpa)(adc)] _n (2) are isolated under the same reaction conditions. Furthermore, the formation of supramolecular networks of higher dimensionality in 1 and 2 has different associations: hydrogen bonding interactions between lattice water molecules and the uncoordinated oxygen atoms of adc are primarily involved in 1, whereas π-π interactions between pyridyl moieties are responsible for it in 2. Both 1 and 2 are characterized by elemental analysis, IR spectroscopy, and thermogravimetric analysis (TGA), single crystal and powder X-ray diffraction. The exceptional thermal stability of 2 compared to 1 based on TGA is correlated to their structural differences. The template-free ecofriendly and efficient fabrication of 1 and 2 to the corresponding metal oxide nanomaterials (ZnO and CdO, respectively) was achieved via the direct calcination method but without any external reagent such as surfactants. Furthermore, a temperature-dependent (400–600 °C) diversification of size and morphology of both ZnO and CdO has established the value of such precursors.
Description:	Only IISERM authors are available in the record.
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