Title:	Investigating the formation of diverse ZnO nanostructures based on solvent, temperature, and pH as adjustable parameters
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Abstract:	Employing a coordination polymer, namely, [Zn2(bpma)2(adc)2]n, as a single-source precursor, the fabrication of diverse ZnO nanostructures with a variation in the morphologies and dimensionalities has been achieved through different processing parameters – solvent, pH and temperature. For example, 0D nanospheres and 1D nanorods have been obtained from the use of different solvents (methanol, ethanol, THF, toluene and hexane). Similarly, 3D nanoflowers composed of 1D nanorods with different aspect ratios have been obtained at two different temperatures (120 °C and 150 °C) as a result of their growth time. Furthermore, a systematic evolution of 3D nanoflowers assembled by nanosheets has been studied in different pH (9–12) conditions. The structural composition and surface morphology of the as-synthesized ZnO nanostructures was investigated by X-ray diffractometry (XRD), field emission spectroscopy (FESEM), transmission electron microscopy (TEM). The solid-state UV-vis diffuse reflectance spectra of the as-synthesized ZnO nanostructures showed absorption in the range of 363–383 nm with band gap values of 3.01–3.21 eV. Further, the photoluminescence spectra of the diverse ZnO nanostructures exhibited blue emission bands in the range of 410–460 nm, which originates from the intrinsic defect states of zinc interstitials, zinc vacancies and oxygen vacancies.
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