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Title: Room temperature aqueous phase synthesis and characterization of novel nano-sized coordination polymers composed of copper(II), nickel(II), and zinc(II) metal ions with *p*-phenylenediamine (PPD) as the bridging ligand

Keywords: Nanostructured, p-Phenylenediamine, Aqueous medium, Mesoporous Crystalline

Year: 2013

Name of journal: *Journal of Nanostructure in Chemistry*

Volume & Issue 3(41)

Page No: 1-9

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Abstract

Nanostructured metal-organic hybrid materials composed of nickel(II), copper(II), and zinc(II) metal ions and p-phenylenediamine (PPD) as the organic ligand were synthesized in aqueous medium at room temperature. The synthesized compounds were characterized by elemental analyses, powder X-ray diffraction (PXRD) spectra, Fourier transform infrared spectra, nuclear magnetic resonance (1H NMR) spectra, electronic spectra, scanning electron microscopy, N2 adsorption-desorption isotherm, and dynamic light scattering studies. N2 adsorption-desorption isotherm of copper(II)-PPD compound confirmed that it has mesoporous structure as it exhibits type-IV reversible isotherm with H1 hysterisis. Steep adsorption indicated that the mesopores possessing it are of uniform order. Barrett-Joyner-Halenda model showed an average pore diameter of 5.2 nm. The PXRD patterns of all the three compounds are identical and showed well-defined and highly intense diffraction peaks, thereby suggesting their nature as crystalline. The broadness of the diffraction peaks indicated that the particles are of nanometer dimensions.

DOI 10.1186/2193-8865-3-41