

Preparation of multi-metal-doped mesoporous silica microspheres

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Metal-doped silica structures have fascinating properties applicable in many fields. In this work, we present a facile method to prepare series of metals (Ni, Ce, Al, Mn, Co)-doped mesoporous silica structure through the sol-gel method. Petal-shaped microspheres in the range of 450 - 600 nm were found, and the morphology was confirmed by transmission electron microscopy(TEM) and scanning electron microscopy(SEM) analysis. Elemental characterization by energy dispersive spectroscopy (EDS) showed that metal elements were well dispersed to spherical microspheres. Detailed structural characterization was further conducted by using powder X-ray analysis (XRD) and N₂ adsorption-desorption analysis. Despite the doping of metal elements, crystal structure and high surface area of 211 - 405 m²/g with a pore diameter of 2.92 - 3 nm were maintained.