

# Nanocomposites and nanomaterials

## Shaping size and physicochemical properties of ZIF-8 nanoparticles by gradual cobalt(II) ions doping

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MOFs (Metal Organic Frameworks) are crystalline solids in which ligands and metal ions form one, two, or three dimensional coordination network and possess cavities which can be accessed by guests, such as gas molecules. Some MOFs can be readily obtained as nanoparticles, amongst others, ZIF-8, which is the product of self-assembly of 2-methylimidazole and zinc ions. Nanoparticles of this MOF have been found to show high porosity, as well as significant chemical and thermal stability. Isostructural material in which zinc ions are replaced by cobalt(II) ions is known as ZIF-67.

It was interesting to see how are shaping properties of mixed-metal ZIF-8 materials, upon modifying the ratio of zinc and cobalt centers. By changing the molar ratio of metal salts we have obtained nanoparticles which are doped by 10, 20, 30, 40 50, 60, 70, 80, and 90 percent of cobalt(II) ions. In addition, we have prepared non-doped ZIF-8 and ZIF-67 materials.

Morphology and size of nanoparticles have been probed by transmission electron microscopy and dynamic light scattering. We found that cobalt(II) doping results in increasing of mean size and polydispersity of nanomaterials. In this contribution the influence of nanocrystal size on gas sorption properties will be presented and discussed. Moreover, insights from far-infrared and UV-Vis spectroscopies will be provided.

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