SYNTHESIS AND CHARACTERIZATION OF NICKEL-METAL ORGANIC FRAMEWORKS-5

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Abstract

Ni-MOF-5s were successfully synthesized by solvothermal method at 140 °C for 12 hours. The mmol ratio of Ni/Zn were varied, i.e 0,05 and 0,1, in order to study the effect of Ni(II)-doped on the formation of MOF-5 materials. The materials were characterized using X-ray diffraction (XRD), fourier transform infrared (FTIR), scanning electron microscopy-energy dispersive X-ray (SEM-EDX), thermogravimetric analysis (TGA), and N$_2$ adsorption-desorption. The XRD patterns of the Ni-MOF-5 were similar to that of synthesized MOF-5 and standart. The SEM images showed that the morphology of Ni-MOF-5 was the same as MOF-5. The Ni-doped MOF-5 exhibited larger BET surface area and pore volume that of MOF-5. The highest BET surface area and pore volume of 17,592 m$^2$/g and 0,0783 cc/g respectively, were archived by the Ni-MOF-5 (0,1).

Key Word: metal-organic framework, Ni-MOF-5, synthesis, solvothermal