SINTESIS DAN KARAKTERISASI NIKEL-*METAL ORGANIC FRAMEWORKS*-5

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Abstrak

Ni-MOF-5 telah berhasil disintesis melalui metode solvotermal pada suhu 140 °C selama 12 jam. Perbandingan mmol Ni/Zn divariasi sebesar 0,05 dan 0,1 untuk mempelajari pengaruh doping Ni^{2+} terhadap struktur material MOF-5. Padatan dikarakterisasi dengan Difraksi Sinar-X (XRD), *Fourier Transform Infrared* (FTIR), *Scanning Electron Microscopy-Energy Dispersive X-Ray* (SEM-EDX), *Thermal Gravimetric Analysis (*TGA), dan Isoterm Adsorpsi-desorpsi N_2. Hasil XRD menunjukkan bahwa pola difraktogram Ni-MOF-5 sama dengan pola difraktogram MOF-5 hasil sintesis dan standart. Hasil foto SEM menunjukkan morfologi Ni-MOF-5 sama dengan morfologi MOF-5. Penambahan Ni^{2+} dapat meningkatkan nilai luas permukaan BET dan volume pori dari Ni-MOF-5 dibandingkan dengan MOF-5 tanpa doping Ni^{2+}. Luas permukaan spesifik (S_{BET}) tertinggi dicapai oleh Ni-MOF-5 (0,1) sebesar, 17,592 m^2/g dengan volume pori sebesar 0,0783 cc/g.

Kata kunci: *metal-organic framework, Ni-MOF-5, sintesis, solvotermal*

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 synthezised 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 archieved by the Ni-MOF-5 (0,1).

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