

Gas Sorption Properties of New Mesoporous, Functionalized MOFs

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Metal organic frameworks (MOFs) are a novel class of porous nanomaterials, containing both an organic and an inorganic part. Ultra high porosity and tunable functionalization of MOFs render them unique candidates for numerous applications.[1] Among them, gas-storage applications are considered very important especially for CO₂ and CH₄. [2] For these particular applications, MOFs with unsaturated metal sites and organic linkers functionalized with strong polarizing groups are considered very promising due to enhanced gas-framework interaction.[3] Mg-MOF-74, a material containing 1-D hexagonal channels and unsaturated metal sites, has shown a remarkable CO₂ uptake of 35.2 wt %, at 1 bar and 296 K.[4] Therefore, incorporation of polar functional groups into MOF-74 can further enhance its CO₂ uptake. We have successfully synthesized and characterized a series of expanded, mesoporous functionalized MOF-74 (Zn²⁺, Co²⁺, Mn²⁺, Mg²⁺) analogues. Detailed and extensive gas sorption properties will be presented and discussed.

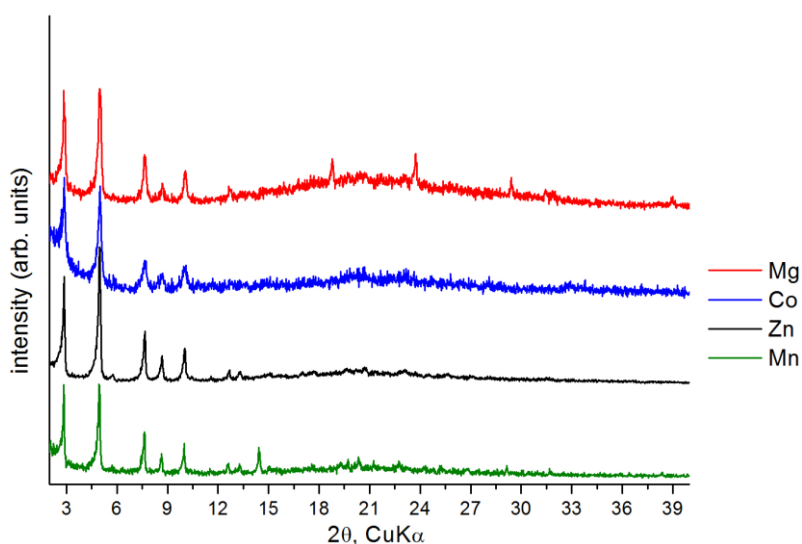


Figure 1. Powder X-Ray diffraction patterns of the as synthesized materials.

References

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