

CO₂ adsorption of porphyrinic zirconium metal-organic frameworks

유광선, 안화승^{1,†}
인하대학교; ¹인하대
(whasahn@inha.ac.kr[†])

The metal-organic frameworks [MOF-525, Zr₆O₄(OH)₄(TCPP-H₂)₃; MOF-545, Zr₆O₄(OH)₄(TCPP-H₂)₂], have been synthesized and conducted for CO₂ adsorption. MOF-525 and -545 are composed of porphyrin linked by either Zr₆O₄(OH)₄ cuboctahedral units (MOF-525) or Zr₆O₈(H₂O)₈ unit (MOF-545). The synthesized MOFs were characterized by X-ray powder diffraction (XRD), N₂ adsorption-desorption isotherm at 77 K, and scanning electron microscopy (SEM) measurements. The CO₂ adsorption amount and BET surface area of both synthesized MOFs are up to 61.7 mg g⁻¹ (MOF-525: 2325 m² g⁻¹) and 72.3 mg g⁻¹ (MOF-545: 2040 m² g⁻¹) at 298 K/1 bar. Additionally, both porphyrin containing MOFs show excellent stability under aqueous and organic conditions.