

Synthesis and water adsorption properties of aluminum base methyl-functionalized MOFs

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In recent decades, MOFs (metal-organic framework) have received great attention from researchers because of higher porosity than conventional porous materials such as silica gel and zeolites. MOFs are crystalline compounds composed of organic-ligands and metal ion clusters. Their Pore size and adsorption characteristics can be changeable by using organic ligands and functional groups like hydroxyl, sulfonic, methyl and etc. Due to these characteristics, it has been attempted to apply MOFs to various fields such as gas separation, sensor, drug delivery, and adsorption chillers are used. Among these applications, adsorption chillers system utilized adsorption/desorption heat energy when MOFs adsorb and desorb water vapor. Aluminum based MOF, CAU-10-H, has feature of a high and steep water adsorption isotherm in narrow relative humidity window (P/P0 between 0.1 and 0.2). In this study, Modified CAU-10 MOFs, CAU-10-H/CH₃, using ligands with various ratio of methyl group were synthesized and the water adsorption isotherms were measured.