

Porous MIL-88-NH₂(Fe) metal organic framework: A promising candidate for CO₂ fixation reaction

Francis Kurisingal Jintu, 구윤장, 박대원[†]
부산대학교
(dwpark@pusan.ac.kr[†])

The development of CO₂ capture and sequestration/storage (CCS) technologies that involve catalyst-mediated reactions are essential. MOFs are a new and emerging class of porous material derived from secondary building units and organic linkers and have been dynamically investigated as catalysts for the synthesis of cyclic carbonates owing to its greater CO₂ affinity. In this study, amino-functionalized iron-based metal organic framework (MOF) octahedra has been successfully synthesized using solvothermal method. The resultant MIL-88-NH₂ (Fe) can be utilized for the synthesis of cyclic carbonates from epoxides and CO₂. The synergistic effect between metal center (Fe) and bromide anion of co-catalyst achieves excellent catalytic conversion of epichlorohydrin under solventless condition at 50 °C at 6 h and 1.2 MPa CO₂ pressure. Finally, a plausible reaction mechanism for MIL-88-NH₂ (Fe) catalyzed cycloaddition was proposed.