

Zirconium oxide based isorecticular MOF for the Chemical Fixation of CO₂ with Epoxides

김현준, 최각규, 김설희, 정혜민, Kuruppathparambil Roshith Roshan, 황규영, 박대원†

부산대학교

(dwpark@pusan.ac.kr†)

CO₂ is a main greenhouse gas that leads to global warming. However it is a cheap, nontoxic, abundant and renewable C1 feedstock. Thus the chemical fixation of CO₂ into useful products is of general interest from an environmental and economic point of view. The coupling reaction of epoxide with CO₂ forming five membered cyclic carbonates is a highly atom economical way of fixing CO₂. Five membered cyclic carbonates are employed as polar aprotic solvents, electrolyte solvents for lithium batteries, monomers for polymer synthesis, various chemical intermediates, degreasing agents etc. We studied the catalytic potential of zirconium oxide based MIL metal-organic framework (MIL-140 C) for the above transformation. Various physico-analytical techniques were used to characterize MOF. The MOF is active at room temperature and lower pressures of CO₂ under co-catalyst free conditions.