

Indium based Metal Organic Frameworks for the Chemical Fixation of CO₂ via Cyclic carbonate synthesis

Robin Babu, 김한웅, 김설희, Yi Xin Li, 박대원[†]

부산대학교

(dwpark@pusan.ac.kr[†])

Developments of heterogeneous catalyst systems capable of catalyzing the CO₂ of resource utilization and its 100% atom economicity. CO₂ has long been acclaimed to be an efficient source for five membered cyclic carbonate syntheses from epoxides, since it avoids the use of toxic raw materials such as COCl₂ and CO. Indium is one of the less explored elements for its catalytic activity towards the cycloaddition of CO₂ with epoxides to yield five membered cyclic carbonates. Considering the wide range of clusters and complexes that can be formed with indium nodes, a large number of metal organic frameworks with potential catalytic abilities could be synthesized. In this work, we examined the catalytic potential of a series of indium based metal organic frameworks. The activity studies were carried out by using propylene oxide with TBAB as co-catalyst under mild reaction conditions. The differences in the activities of the Indium based MOFs can be explained on the basis of topological studies. A systematic investigation on the structural features, acid-base characteristics and physical properties were carried out. The catalyst was separable by simple filtration, and heterogeneous nature of the catalyst was investigated.