

Organic-inorganic hybrid catalyst for cooperative coupling of CO₂ and propylene oxide to propylene carbonate

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Global warming is inevitable problem due to the increase of carbon dioxide concentration in atmosphere. Utilization of CO₂ to value-added fine chemicals has definite advantages on two counts; decrease of CO₂ concentration and practical use of product. Coupling reaction between CO₂ and epoxide to produce cyclic carbonate is considered one of the energy-efficient utilization processes. More specially, cyclic propylene carbonate can be produced by coupling reaction between CO₂ and propylene oxide without by-products. Cyclic carbonate is widely used as electrolytes in lithium-ion batteries, monomer for polycarbonate, and feedstock for other fine chemicals. In this poster, we synthesized the organic-inorganic multifunctional hybrid catalyst by grafting ammonium halide on the mesoporous zeolite. The hybrid catalyst having both strong acid site on the zeolite framework and ammonium halide group shows significantly enhanced catalytic activity than the catalysts having only single function. We found that catalytic effects could be obtained synergistically due to the close proximity between two catalytic functions. The details will be discussed in this poster presentation.