

Zeolitic Imidazolate Frameworks as a Catalyst for the synthesis of cyclic carbonates from CO₂

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Zeolitic imidazolate frameworks (ZIFs) are a new class of porous crystals combining advantages from both zeolites and conventional MOFs. Research works have been mostly focused on synthesizing new ZIFs and investigating their applications in gas storage and gas separation properties. Highly desirable properties of ZIFs, such as uniform micropores, high surface areas, and open porous framework structures with large accessible pore volumes makes them potentially interesting candidates for catalytic applications. In particular, zinc-containing ZIF is an appealing material to employ as catalyst for CO₂ conversion to cyclic carbonates. A highly porous zeolite imidazolate framework(ZIF-90) was synthesized by various methods, and the post-synthesis functionalization was performed on the crystals of ZIF-90. The functionalized ZIFs were successfully utilized as an effective catalyst for the cycloaddition of CO₂ to allyl glycidyl ether(AGE) without any solvents. The solid catalysts were characterized using various physicochemical methods. The effects of reaction parameters were also investigated.