

ZIF-95 as a Catalyst for the Solventless Synthesis of Propylene Carbonate from Propylene oxide and CO<sub>2</sub>

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Zeolitic imidazolate frameworks (ZIFs) are a large emerging class of porous crystalline MOFs with tetrahedral networks that resemble those of zeolites: transition metals (Zn, Co) replace tetrahedrally coordinated atoms (for example, Si), and imidazolate links replace oxygen bridges. The synthesis of cyclic carbonates from epoxides and CO<sub>2</sub> under mild conditions have drawn much attention because of its 100 % atom economicity. ZIF-95 being a microporous material shows high affinity & capacity for CO<sub>2</sub> adsorption. Here, in the present work we have prepared highly porous ZIF-95 crystals and employed it as a catalyst for the epoxide-CO<sub>2</sub> cycloaddition. Synthesized ZIF-95 was characterized by various physicochemical methods. Cycloaddition reactions were carried out at 80 °C by using propylene oxide as substrate along with tertiary butyl ammonium bromide as co-catalysts. Results showed that nearly 83 % conversion was observed within 2 h with almost 100% selectivity. Different epoxide substrates were subjected to the cycloaddition using ZIF-95 catalyst.. The effects of different reaction parameters like catalyst amount, reaction time, reaction temperature, and CO<sub>2</sub> pressure have been also investigated.