
Abstract

The metalloporphyrins are very efficient catalysts for the cycloaddition of CO₂ in epoxide, producing a high yield of cyclic carbonates. The 5, 10, 15, 20-tetrakis (4-methoxy) phenyl porphyrin-based metal (Co, Zn, Ni) complexes were prepared by using dimethylformamide (DMF) as a solvent, and fully characterized by using UV-Visible and FTIR spectroscopy, the results of these analysis techniques showed that the “soret” band became less intense while Q-bands appeared more intense as compared to the porphyrin ligand and the peaks confirm that the N-H bond stretching was disappeared respectively. These metal-porphyrin complexes were very active catalysts (TON = 9,091 and TOF = 2,272) for CO₂ conversion under optimal conditions (120°C and 1 bar pressure of CO₂) without using a solvent. The effect of co-catalyst was also investigated. The catalytic result showed that moderate to high yields of cyclic carbonates up to 91% were obtained by using tetra-n-butylammonium bromide (TBAB) as a co-catalyst. The products formed by reactions were analyzed by HPLC method.