Abstract

Carbon dioxide (CO_2) is a chief greenhouse gas, mainly accountable for global warming, thus leading to climate change. Therefore, CO_2 fixation reactions are highly significant to cater the global challenges through its effective utilization, which is in high interest by environmental and commercial perspectives. The metallic composites based on transition metal oxides are considered as potent catalysts for the cycloaddition reaction of carbon dioxide (CO_2) with epoxide producing cyclic carbonates. The metal oxide composites based on Cd, Al, Fe and Cr were synthesized *via* sol-gel method and characterized by FTIR spectroscopy, SEM analysis and Powder XRD. The results of these analytical techniques confirmed the formation of respective catalysts. These metal oxides were shown as good catalysts for the effective conversion of carbon dioxide under normal conditions *i.e.,* 1 bar pressure coupled with 120 °C temperature. Moreover, the efficacy of reaction by employing co-catalyst tetrabutylammonium bromide (TBAB) was also investigated. The catalytic results exhibited the moderate yield of corresponding cyclic carbonates. The resulted products were investigated using GCMS.