

Microwave mediated synthesis of Cu-TUD-1 as an efficient oxidation catalyst

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By the advantages of microwave synthesis metal loaded TUD-1(Ti-TUD-1, Cu-TUD-1 etc.) were successfully prepared by using triethanolamine (TEA) as both structure directing and chelating agents. Compared to the traditional hydrothermal synthesis of Cu-TUD-1 materials reported in literature, the CuO Peaks are less prominent over a wide range of Si/Cu ratios. This is attributed to the microwave effect, which resulted in rapid nucleation and fast crystallization. Further this M-TUD-1 catalysts were investigated in the liquid-phase oxidation of aromatic substrates. The enhanced oxidation activity and improved selectivity on the oxygenate products were obtained under milder operating condition and can be attributed to the nano dispersed CuO species obtained as a result of microwave irradiation. Important factors associated with the catalytic activity and selectivity such as reaction time, temperature, molar ratio and copper loading were also investigated.