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Catalysis, Kinetics and Reaction Engineering

Synthesis and Catalytic Activity of SBA-15 Supported Catalysts for Styrene Oxidation

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Abstract

Cu (II) and Mn (II) metals embedded on mesoporous SBA-15 were synthesized by co-precipitation technique. The support and catalysts were characterized by SEM-EDX, TEM, BET, XRD and ICP-AES methods. The catalytic activity of these catalysts was evaluated for styrene oxidation at various reaction conditions such as styrene to TBHP mole ratio, temperature, catalyst amount by using TBHP as an oxidizing agent. Major reaction products were styrene oxide and benzaldehyde and highest styrene conversion (97.3%) was observed at styrene to TBHP mole ratio of 1:4, temperature 80°C and 20 mg of catalyst. Further, the recyclability of the catalysts was observed and found that they can be recycled three times without major loss in their activity and selectivity.

Keywords- SBA-15, styrene, styrene oxide, benzaldehyde, oxidation, catalytic oxidation