

Synthesis and Characterization of Hexagonal Mesoporous Materials with TS-1 Structure and Their Catalytic Activity

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Titanium-containing mesoporous materials, which are Ti-MCM-41 and Ti-SBA-15, were synthesized by the modified hydrothermal synthesis method. The transformation of Ti-MCM-41 and Ti-SBA-15 was performed using the DGC (dry-gel conversion) process. The template for the synthesis of composite materials, which are Ti-hexagonal mesoporous materials/TS-1, is TPAOH. The synthesized titanium composite materials have hexagonal mesopores when the DGC process was carried out at 448 K. The catalytic activity of synthesized composites was measured by the epoxidation of olefins which are 1-hexene and cyclohexene. For the comparison of the catalytic activity, the TS-1, Ti-MCM-41 and Ti-SBA-15 were also used for the epoxidation of same olefins at the same catalytic reaction conditions. In the case of titanium containing composites, the conversion of olefins and selectivity of epoxide are higher than those of Ti-MCM-41 and Ti-SBA-15. The synthesized composites have remarkable activity of the epoxidation of olefins.