

Synthesis of Ti-TUD-1 and Its Photocatalytic Activity in Photo Catalysis

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The Ti containing mesoporous silica material such as Ti-MCM-41 or Ti-SBA-15 which has well-defined mesoporous pore structure (i.e., with 20–100 Å pore size) have represented high catalytic activity. In addition, a zeolite (i.e., with 0–20 Å pore size) such as TS-1 or Ti-MFI having titanium contents is also widely used for oxidation reaction. However, even though MCM-41 or SBA-15 has large pore size and high crystallization, but their thermal stability is weaker than TUD-1. So, metallic components of Ti, Zr, Fe containing TUD-1 have been synthesized and applied in catalysis. Our recent report on Ti-TUD-1 material reveals the superiority of Ti-TUD-1 over commercial TiO₂ in case of photo degradation of Methylene blue in the presence of UV light. The Ti incorporation has created the required bandgap energy depending on the Si/Ti ratios. Different ratios of Si/Ti have been synthesized ranging from 10 to 30 giving different bandgap energies.