

Preparation & Characterization of Thermally Stable Porous TiO₂ Catalyst by Modified Sol-Gel Method with Ionic Liquid

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It is well known the porous anatase form, as compared to the rutile phase, is of greater important and interest due to its better catalytic properties. However, anatase crystalline phase of TiO₂ is metastable and transformed into rutile at high temperatures. To overcome the disadvantage, in our previous work, the TiO₂ particles with high surface area, stable crystal structure and controlled porosity, even high temperature, were synthesized by ionic liquid (IL)-assisted sol-gel method. But the method has crucial drawbacks such as highly consumption of expensive ionic liquid and extra process to remove ionic liquid with organic solvents. In this work, a small amount of IL was employed into the conventional sol-gel method using acetic acid as an additive material. By this approach, thermally stable porous TiO₂ was successfully prepared with only 1% IL of previous work. The prepared TiO₂ samples were characterized by XRD, N₂ isotherm and TEM.