

PROCESS AND PRODUCT TECHNOLOGY

表面活性剂辅助水热法中TiO₂的形状控制

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摘要 By hydrolysing titanium isopropoxide in a long hydrocarbon chain surfactant-containing solution, TiO₂ fine particles with a diversity of well-defined morphologies was synthesized in this study by a hydrothermal route. The structural change during the formation process was monitored by scanning electron microscopy, transmission electron microscopy and X-ray diffraction analysis. TiO₂ with various morphologies such as particle, sheet, rod, tube and flower-like shape was obtained by carefully controlling the preparation conditions. The experimental re-sults show that the pH value is crucial for shape control of the produced TiO₂ because it can change the charge state of the surfactant in the solution and the adsorption potential of the surfactant on the TiO₂ surface. The shape evolvement of anatase TiO₂ was elucidated by quenching the reaction at different stage and the formation mechanism of different shaped TiO₂ was suggested.

关键词 [morphology control](#) [titanium dioxide](#) [charged state](#) [anatase](#)

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Morphology control of anatase TiO₂ by surfactant-assisted hydrothermal method

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Abstract

By hydrolysing titanium isopropoxide in a long hydrocarbon chain surfactant-containing solution, TiO₂ fine particles with a diversity of well-defined morphologies was synthesized in this study by a hydrothermal route. The structural change during the formation process was monitored by scanning electron microscopy, transmission electron microscopy and X-ray diffraction analysis. TiO₂ with various morphologies such as particle, sheet, rod, tube and flower-like shape was obtained by carefully controlling the preparation conditions. The experimental re-sults show that the pH value is crucial for shape control of the produced TiO₂ because it can change the charge state of the surfactant in the solution and the adsorption potential of the surfactant on the TiO₂ surface. The shape evolvement of anatase TiO₂ was elucidated by quenching the reaction at different stage and the formation mechanism of different shaped TiO₂ was suggested.

Key words [morphology control](#); [titanium dioxide](#); [charged state](#); [anatase](#)

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