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TiO_2纳米粒子的表面修饰研究

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摘要 利用表面修饰法合成了油酸（OA）修饰的TiO_2纳米粒子，采用红外光谱（IR ）、透射电子显微镜（TEM）和X射线光电子能谱（XPS）对表面修饰的TiO_2纳米粒 子进行了结构表征，并研究了油酸浓度对TiO_2表面覆盖量及在油中分散性能的影 响。研究结果表明通过油酸表面修饰，成功合成了具有油分散性能的纳米TiO_2， 并且获得了油酸修饰量与TiO_2的最佳配比。

关键词 油酸 氧化钛 红外分光光度法 透射电子显微术 X射线光电子谱法 结构表征

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Study on the Surface-modification of TiO_2 Nanoparticles

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Abstract TiO2 nanoparticles modified by oleic acid (OA) were prepared using surface-modification method. Infrared spectroscopy (IR), transmission electron microscopy (TEM) and X-ray photoelectron spectra (XPS) were used to investigate' the structure of the modified TiO_2 nanopartieles. Effects of OA concentration on coverage and dispersion in oil were also studied. The optimal proportion of OA to TiO_2 was established. The results indicate that the oleic acid is bonded to the surface of TiO_2 nanoparticles. The OA-modified TiO_2 nanoparticles have good dispersive capacity in organic solvent and mineral oil. An esterification mechanism for the surface-modification is proposed.

Key words OLEIC ACID TITANIUM OXIDE IR TEM XPS STRUCTURE CHARACTERISTICS

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