

论文

阴极共电沉积法制备 Fe^{3+} 掺杂 TiO_2 纳米薄膜及其可见光活性

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收稿日期 2006-6-8 修回日期 2006-9-4 网络版发布日期 2007-4-30 接受日期

摘要 研究了阴极共电沉积制备 Fe^{3+} 掺杂 TiO_2 纳米薄膜 (Fe-TiO_2) 的新方法. 应用该方法、溶胶-凝胶法和浸渍法分别制备了具有可见光响应的 Fe-TiO_2 光催化剂. 并用 XRD、SEM、EDS 和 UV-vis 吸收光谱对 Fe-TiO_2 进行了表征. 结果表明, 与溶胶-凝胶法和浸渍法相比共电沉积法不仅能有效地实现 Fe^{3+} 在 TiO_2 中的均匀分布, 而且, 得到的光催化剂具有最大的比表面积和最好的光降解活性. Rhodamine B (RhB) 降解实验表明, 在 RhB 光降解中存在光敏化和光催化降解的协同效应.

关键词 [共电沉积](#) [掺杂](#) [TiO₂膜](#) [可见光](#)

分类号 [X703, TB43](#)

Cathodic Co-electrodeposition of Fe^{3+} -doped TiO_2 Thin Films and Their Photocatalytic Activity under Visible Light

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Abstract A novel cathodic co-electrodeposition (CCED) method for the preparation of Fe^{3+} -doped TiO_2 thin film (Fe-TiO_2) was studied. The thin film photocatalysts of Fe-TiO_2 containing different amounts of Fe^{3+} were prepared by the

CCED, wet impregnation and sol-gel methods. The photocatalysts were characterized by X-ray diffraction analysis (XRD), specific surface area measurements, SEM-EDS and UV-vis absorption spectra. In the three types of photocatalysts, the photocatalysts obtained by CCED not only have a more homogeneous distribution of Fe^{3+} , but also have the largest specific surface area and the photodegradation activity than those obtained by the other two. In addition, the experimental results show that there is a synergetic effect of photosensitization and photocatalytic in RhB degradation.

Key words [co-electrodeposition](#) [dope](#) [TiO₂ film](#) [visible light](#)

DOI:

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