

## 研究论文

### CeO<sub>2</sub>纳米棒的微波合成及其光催化性能

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**摘要:** 采用微波均相法制备具有光催化活性的CeO<sub>2</sub>纳米棒,用扫描电镜(SEM)、透射电镜(TEM)、X射线衍射(XRD)、比表面积与孔径分布测试(BET--BJH)以及紫外--可见吸收光谱测试(UV--vis)等手段对其进行表征,研究了尿素浓度对晶粒尺寸、形貌和光催化性能的影响,结果表明,当尿素浓度达到6.0 mol/L时产物的棒状结构明显,由粒径为20--40 nm的晶粒组成的球链状结构聚集而成,且催化性能较好。以甲基橙为脱色模型进行降解反应,当氧化铈纳米棒加入量为2.0 g/L时,可见光照1 h后甲基橙降解率达到了95.4%,明显高于二氧化钛P25的降解率。

**关键词:** 无机非金属材料 纳米材料 CeO<sub>2</sub>纳米棒 微波均相 光催化

### Microwave Homogeneous Synthesis and Photocatalytic Property of CeO<sub>2</sub> Nanorods

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**Abstract:** Nanorod - CeO<sub>2</sub> photocatalyst was synthesized by the microwave homogeneous precipitation method and was characterized by SEM, TEM, XRD, BET - BJH, and UV - vis spectrum. The effects of urea concentration on the grain size, morphology and Photocatalytic property were investigated. The results show that when the CO(NH<sub>2</sub>)<sub>2</sub> concentration is 6.0 mol/L, the obvious club - shaped structure consisted of chains which are formed by grains whose size is 20 - 40 nm. The photocatalytic activity of CeO<sub>2</sub> nanorods was evaluated by degradation of methyl orange. The degradation rate of methyl orange reaches 95.4% under the reaction conditions of the catalyst amount of 2.0 g/L, the sunshine, and the reaction time of 1 h.

**Keywords:** inorganic non - metallic materials nano - materials CeO<sub>2</sub> nanorods microwave homogeneous synthesis photocatalytic

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- 无机非金属材料
- 纳米材料
- CeO<sub>2</sub>纳米棒
- 微波均相
- 光催化







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