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### CuO-TiO<sub>2</sub>/导电聚合物纤维复合材料的制备及其光催化性能

#### Preparation and photocatalytic properties of CuO-TiO<sub>2</sub>/conductive polymer fiber composites

关键词: [导电聚合物纤维](#) [光催化](#) [CuO](#) [TiO<sub>2</sub>](#) [次甲基蓝](#)

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作者 单位

胡伟 合肥工业大学化工学院, 合肥 230009

任凤梅 合肥工业大学化工学院, 合肥 230009

白仁斗 合肥工业大学化工学院, 合肥 230009

周正发 合肥工业大学化工学院, 合肥 230009

徐卫兵 合肥工业大学化工学院, 合肥 230009

摘要: 利用高压静电纺丝技术,制得含羧基的导电聚合物纤维(聚偏氟乙烯/苯乙烯-马来酸酐共聚物/纳米石墨)。水热条件下在纤维表面原位合成了纳米级的TiO<sub>2</sub>,再通过水热法在TiO<sub>2</sub>表面制备了微米级的球形CuO颗粒,得到CuO-TiO<sub>2</sub>/导电聚合物纤维复合材料。运用扫描电子显微镜(SEM)、X射线衍射仪(XRD)、紫外-可见吸收光谱仪(UV-Vis)和热失重分析(TGA)对复合材料的结构与性能进行表征,并利用氙灯模拟太阳光进行光催化降解次甲基蓝实验。结果发现,CuO-TiO<sub>2</sub>/导电聚合物纤维复合材料的降解效率高于CuO-TiO<sub>2</sub>/非导电聚合物纤维、CuO-TiO<sub>2</sub>粉体和Degussa P25,光催化降解3.5 h时,次甲基蓝的残留率为4.7%。

**Abstract:** This paper focused on preparation of CuO-TiO<sub>2</sub>/conductive polymer fiber composites and its photocatalytic degradation of methylene blue. Firstly, conductive polymer fiber was prepared by electrospinning. Ti<sup>4+</sup> ions were then introduced onto the conductive polymer fiber surface by coordinating with carboxyls of SMA. TiO<sub>2</sub> particles were synthesized by hydrothermal synthesis, and CuO particles were grown on the surface of TiO<sub>2</sub> particles. The structure of CuO-TiO<sub>2</sub>/conductive polymer fiber composites were characterized by Field-emission scanning electron microscopy (SEM), X-ray diffraction (XRD), Ultraviolet-visible (UV-Vis) and Thermo-gravimetric analysis (TGA). The degradation of methylene blue (MB) aqueous solution with the composites as the catalyst was performed under Xe lamp irradiation. The results showed that the composites had good photocatalytic efficiency. After 3.5 h photocatalytic reaction, the residual quantity of methylene blue was 4.7%.

**Key words:** [conductive polymer fiber](#) [photocatalyst](#) [CuO](#) [TiO<sub>2</sub>](#) [methylene blue](#)

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服务热线: 010-62941073 传真: 010-62941073 Email: [hjxxb@rcees.ac.cn](mailto:hjxxb@rcees.ac.cn)

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