

研究通讯

可见光照射下 $\text{SiW}_{12}\text{O}_{40}^{4-}/\text{Resin}$ 光催化剂活化可见光照射下 $\text{SiW}_{12}\text{O}_{40}^{4-}/\text{Resin}$ 光催化剂活化 H_2O_2 降解染料的研究

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摘要 将杂多酸($\text{SiW}_{12}\text{O}_{40}^{4-}$)负载到阴离子交换树脂上, 得到 $\text{SiW}_{12}\text{O}_{40}^{4-}/\text{Resin}$ (SWR)固相光催化剂, 在可见光的照射下, 可以有效地活化 H_2O_2 降解染料. 以罗丹明B (Rhodamine B, RhB)为模型化合物, 研究了不同条件下RhB的降解动力学, 以及降解过程中其UV-vis光谱及体系的总有机碳(Total Organic Carbon, TOC)变化情况, 结果表明RhB的共轭芳环结构被破坏, 矿化率为24.2%. 其它染料如孔雀绿(Malachite Green, MG)和吡啶橙(Acridine Orange, AO)等也可以被降解和矿化. 催化剂的循环实验表明SWR固相光催化剂易于分离, 并且具有良好的稳定性, 可以重复利用.

关键词 [杂多酸](#) [树脂](#) [光催化剂](#) [降解](#) [总有机碳](#) [矿化](#)

分类号

Degradation of Dyes by Photocatalyst $\text{SiW}_{12}\text{O}_{40}^{4-}/\text{Resin}$ with H_2O_2 under Visible Light Irradiation

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Abstract A heterogeneous polyoxometalate photocatalyst, $\text{SiW}_{12}\text{O}_{40}^{4-}/\text{Resin}$ (SWR), was obtained by loading $\text{SiW}_{12}\text{O}_{40}^{4-}$ on an anionic exchange resin and used to activate H_2O_2 for the efficient degradation of dyes under visible light irradiation. Rhodamine B (RhB) was employed as a model compound for the kinetic study in the photoreaction. The variations of the UV-vis spectra of RhB and the total organic carbon changes of the system indicated that the aromatic structure of RhB dye was decomposed, with a mineralization content of 24.2%. Similarly, dyes such as malachite green and acridine orange could also be degraded and mineralized. The recycle experiment suggested the excellent stability and reusability of the heterogeneous SWR photocatalyst.

Key words [polyoxometalate](#) [resin](#) [photocatalyst](#) [degradation](#) [total organic carbon](#) [mineralization](#)

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