改良型二氧化鈦光觸媒複合材料去除水溶液之染料之研究

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摘 要

研究以光催化合成法製備不同的二氧化鈦光觸媒複合材料，包括 TiO2/Al2O3、TiO2/GAC、Fe/ TiO2/Al2O3、Ba/TiO2/Al2O3、Sr/ TiO2/Al2O3，並分析其物化特性與表面型態。本研究並以自行製備的光觸媒複合材料，在紫外光照射下，對不同染料(AR27, RR141)溶液進行分解反應；並探討其最適操作條件，包括染料溶液pH值、TiO2劑量、染料初始濃度等因子。 本研究使用ICP-AES、BET、SEM/EDX與XRD等儀器鑑定光觸媒之基本特性。實驗結果顯示，BET測量之比表面積大約在103~105 m2/g。若觀察染料濃度的降解情形，與以擬一階反應速率方程式來描述實驗結果，可發現製備的金屬光觸媒複合材料，在光催化分解染料廢水的實驗中對染料的分解效能較佳；且其最佳pH值為3；最佳光觸媒劑量為0.05g。實驗證明以光催化合成法可以有效將金屬沉積於TiO2表面，製備出更有效之光觸媒複合材料。

關鍵詞 : 光催化反應 ; 光觸媒 ; 二氧化鈦 ; 染料 ; 擬一階反應速率方程式

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