結合化學置換法及Fenton-like程序處理含重金屬及有機物混合溶液之反應行為研究

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摘 要

本研究旨在探討以結合化學置換法及Fenton-like程序處理個別及混和之重金屬、染料及含異丙醇溶液之反應行為，針對不同的反應條件（起始濃度、亞鐵離子與過氧化氫之劑量及比值、pH值、反應溫度等效應）、有機物物種（酸性染料 Acid Orange 10、Acid Red 4、Acid Red 27、異丙醇）及重金屬（Cu2+）進行探討，以嘗試了解各因子在各氧化及還原系統中所扮演的角色及其對反應之影響，據以求得氧化及還原反應之最佳條件，並建立反應動力速率式，作為未來應用研究之參考。 實驗結果顯示，以化學置換法及Fenton-like程序處理含染料Orange 10、異丙醇水溶液時，污染物去除率隨鐵粉添加劑量之增加、H2O2劑量之提高、污染物初始濃度之降低、攪拌器轉速之提高、水中溶氧量提高而升高，以及溶液pH值超過3而降低，其中鐵粉添加劑量、H2O2劑量與溶液pH值為主要影響污染物氧化還原速率之反應因子。在Fenton-like程序中，結合系統化學置換法及Fenton程序之反應動力式，所推導與建立之速率方程式及反應動力式，可合理模擬在各操作條件下水中鐵離子溶出、異丙醇溶液之分解行為及濃度分佈情形，可做未來為處理程序改良之基礎。

關鍵詞 : 染料廢水 ; 異丙醇 ; 速率方程式

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