以改質光觸媒程序還原含六價鉻廢水之反應行為研究

林柏翔、申永順

E-mail: 9607867@mail.dyu.edu.tw

摘 要

本研究利用改質二氧化鈦進行UV/TiO2程序光還原處理含六價鉻水溶液，並探討溶液pH值、二氧化鈦劑量、電洞捕捉劑種類、電洞捕捉劑劑量及改質二氧化鈦之重金屬種類與劑量等實驗因子對六價鉻去除效率及反應速率決定步驟之影響。 利用UV/TiO2程序處理六價鉻水溶液時，隨著pH值降低及電洞捕捉劑的添加量的提高，而增加了六價鉻去除速率。可知，電洞捕捉劑的添加，降低了二氧化鈦因光照產生的電子電洞對再結合的機率，進而提升了六價鉻的還原效率。六價鉻之擬一階去除速率常數、二氧化鈦劑量及六價鉻濃度變化之關係，可以擬一階動力方程式表示。於改質系統中，比較兩種不同覆載金屬(銀與銅)對六價鉻還原率之結果，以Ag(NO3)改質之二氧化鈦效果最佳，因Ag對電子之抓取率較高，覆載於二氧化鈦上之銀離子，提升光催化活性，而達到更快速轉移電子的目的。但經改質後之光觸媒對六價鉻之還原率較未改質之商用Degussa P25二氧化鈦差。

關鍵詞 : 六價鉻 ; 改值光觸媒 ; 光還原 ; 電洞捕捉劑 ; UV/TiO2光催化程序

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