廢PU泡綿再利用研究

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摘 要

聚氨基甲酸乙酯（PU）的使用與日俱增，經使用後的處理與處置問題，愈來愈受重視。廢PU的主要處理方法有掩埋處理法、資源回收法、物質回收法及化學處理回收法等。而就化學處理回收法來說，廢PU泡綿經由添加化學物質，在適當的觸媒催化及反應條件下產生化學反應，反應後可得到PU的原料或初級石化原料。醇解反應（GLYCOLYSIS）為化學處理回收法之一種，影響醇解反應的因素有溶劑的種類及濃度、觸媒配方及反應條件的控制。有鑑於此，本研究探討上述因素對PU醇解過程及產物性質的影響，以做為實廠設計之參考資料。 本研究採用的樣品為軟質PU泡綿，以添加不同配比的化學反應劑及觸媒，在常壓及恆溫下進行醇解反應。實驗使用的反應劑為二甘醇（DEG），觸媒為醋酸鉀（CH3COOK），反應溫度為220℃。醇解產物性質分析項目包括氫氧基值、重量平均分子量、黏度及PU泡綿中-NCOO-官能基的轉化率。研究結果顯示，以DEG / PU＝ 150%，KAC / PU = 1%，反應時間90 MIN為適當反應配比、觸媒濃度及反應時間。在純化研究中發現，第二階段蒸餾（氣相溫度245~260℃）之餾出物比例最高，其氫氧基值與DEG者接近。 從DEG添加量、-NCOO-轉化率、觸媒濃度及反應時間的分析結果，得到適當反應配比及觸媒濃度（DEG / PU = 150%，KAC / PU = 1%）下之反應動力式可表示為：DX/DT=0.014×(1-X)3.71×(KAC)0.6 ×(DEG)1.12，其決斷係數為0.8202，表示反應動力式是可接受的。

關鍵詞 : 聚氨基甲酸乙酯、醇解反應、產物分析、反應動力、純化

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