

在超臨界二氧化碳流體中以脂解酵素催化合成乙酸己酯之研究

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摘要

香料現今已被廣泛使用在食品、飲料等工業上。但目前大部分的香料都是以化學合成為主，使用化學的方式來合成酯類時，會因高溫高壓造成產率低且容易引起不必要的副產物等缺點；相較於化學法，酵素法具有反應溫和、降低成本及產物容易分離純化等優點。本研究利用超臨界二氧化碳為溶劑以脂解酵素 IM77 催化己醇 (HEXANOL) 和三乙酸酯 (TRIACETIN) 之間的轉酯化反應。先以一對一的實驗方式探討反應時間、溫度與壓力對乙酸己酯之莫耳轉換率的影響，再利用反應曲面法 (RESPONSE SURFACE METHODOLOGY, RSM) 和三階層三變數的部份因子實驗設計 (FRACTIONAL FACTORIAL EXPERIMENTAL DESIGN) 來探討反應變數，如反應時間 (30-90 MIN)、反應溫度 (35-55 °C)、反應壓力 (1500-3500 PSI) 之間的關係及對乙酸己酯之莫耳轉換率的影響，並求得乙酸己酯最優化的合成條件。研究結果發現反應時間與壓力對乙酸己酯莫耳轉化率的影響很重要。而乙酸己酯的最優化莫耳轉化率為 75.56 %

關鍵詞：乙酸己酯、超臨界二氧化碳、轉酯化、反應曲面法、部份因子實驗設計

目錄

第一章 緒論--P1 第二章 文獻回顧--P4 2.1 生物技術之應用--P4 2.2 酵素的介紹--P4 2.2.1 脂解酵素之來源--P5 2.2.2 酵素的特性--P6 2.2.3 固定化酵素--P7 2.3 香料的介紹--P8 2.3.1 使用酵素催化反應來生產香料--P9 2.4 超臨界二氧化碳之應用--P10 2.5 超臨界二氧化碳介紹--P11 2.6 反應系統設計--P12 2.7 脂解酵素在超臨界流體中之酵素酯化反應--P13 2.7.1 脂解酵素在超臨界二氧化碳中酯化反應的影響因子--P14 2.8 反應曲面法之簡介--P15 第三章 以脂解酵素 IM77 合成乙酸己酯最適化合成之研究--P23 3.1 前言--P24 3.2 材料與方法--P25 3.2.1 藥品及材料--P25 3.2.2 器材及儀器設備--P26 3.2.2.1 器材--P26 3.2.2.2 儀器設備--P26 3.2.3 實驗設計--P27 3.2.3.1 合成反應--P28 3.2.4 產物分析與計算--P29 3.2.5 統計分析--P31 3.3 結果與討論--P33 3.3.1 時間對莫耳轉化率的影響--P33 3.3.2 溫度對莫耳轉化率的影響--P33 3.3.3 壓力對莫耳轉化率的影響--P34 3.3.4 數據分析--P34 3.3.5 固定反應壓力對莫耳轉化率的影響--P41 3.3.6 固定反應溫度對莫耳轉化率的影響--P41 3.3.7 固定反應時間對莫耳轉化率的影響--P41 3.3.8 相關研究之綜合討論--P42 第四章 結論--P47 參考文獻--P48 附錄一 統計分析--P58

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