以酵素法合成酯類之研究

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摘 要

本研究主要目的為在有機溶劑中利用脂解酵素合成高產量之酯類，分別探討一級醇及二級醇所合成之酯類，以解決消費者對香料產品之要求，並降低食品及相關業者香料原料的成本。 由一級醇合成之香茅丁酸酯(CITRONELLOL BUTYRATE)為無色透明液體，具有類似柑橘類芳香的精油，現已被廣泛使用在食品、飲料等工業上。傳統方法是利用天然植物中萃取，或利用發酵的方式得到，但其產品的分離、純化複雜及產率低都是缺點。二級醇：麴酸是一種抗菌素晶體，目前已廣泛的使用在殺蟲劑、殺真菌劑和殺微生物劑。麴酸為水溶性物質，其用於化妝品中會有不安定之問題產生，為了增進麴酸之脂溶性，脂化作用則是一個適當的方法。 由於目前大眾對自然產品的需求量日益增多，為了解決上述等缺點，而工業上對使用生物技術方式，尤其是以酵素法合成此類酯貝非常感興趣。其於"天然"與"成本"之考量，本研究在探討得到酵素合成之較佳條件，使其具有較高之經濟價值，並符合商業需求及安全性。 採用五階層，五變數之中心混成設計(5-LEVEL-5FACTOR CENTRAL COMPOSITE ROTATABLE DESIGN; CCRD)，再將所得之產率值利用反應曲面回歸法(RESPONSE SURFACE METHODLOGY; RSM)加以分析，配合等高線圖(CONTOUR PLOTS), 以針得其最優化合成條件。研究結果如下：利用一級醇的香茅醇所合成之香茅丁酸酯在反應在60℃、24H、酵素用量20%、基質莫耳數比1：1.5、添加水0%是酵素IM77最優化合成香茅丁酸酯之條件，可以得到98%的產率。二級醇的麴酸所合成之麴酸月桂酯反應在45℃、20H、酵素用量45%、基質莫耳數比1：2、添加水10%，是酵素PS最優化合成麴酸月桂醴之條件，可以得到82%的產率。

關鍵詞 : 無

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