半纖維素水解液中木糖之分離及其醱酵

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摘 要

農業副產品如稻草含有大量之半纖維素，經酸水解後可得木糖供酵母醱酵成木糖醇。然而水解液中所含之色素成份及為調整pH所產生之鹽類會影響酵母醱酵之效率，故水解液需經前處理後方能用於醱酵。實驗將水解液通過離子交換樹脂以分離色素、鹽份及木糖；結果顯示出，饋料體積為1 mL、沖提流速為3.5 mL/min時於操作溫度45℃下有較佳之分離效果，其分離率達80％。本研究還探討稻草顆粒大小、稻草與酸液之固液比對木糖產率之影響。較小顆粒之稻草粉末具有較佳之木糖回收率，但其顆粒大小與木糖回收率並非線性關係，稻草粉末顆粒於 60 mesh之後則木糖回收率不再提高。而當固液比為1：4(g : mL)時，可得木糖回收率達95.6％，但其水解液回收較為困難，而固液比在 1:6 至 1:10 間其木糖回收率約為 70％，雖較低 30%，但其水解液與稻草殘渣較易分離，容易加工。因此固液比 1:6應是較佳的水解選擇條件。此外，本研究以自行篩選出之酵母菌 Candida subtropicalis 醱酵木糖生產木糖醇，研究顯示出，當培養基中之氮源僅為Yeast extract及Bacto Peptone時有較高之木糖醇轉化率0.89，且其濃度毋需太高；但若添入無機鹽類，則木糖醇轉化率有降低的情況產生。而木糖濃度為10％時之木糖醇轉化率較木糖濃度15％以上時為佳。

關鍵詞 : 半纖維素 ; 水解 ; 木糖 ; 木糖醇 ; 醱酵

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