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分离工程

乙醇/碳酸钾双水相萃取盾叶薯蓣发酵液中的2,3-丁二醇

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摘要

实验考察了乙醇/碳酸钾双水相萃取盾叶薯蓣发酵液中2,3-丁二醇的分配情况，并对其工艺条件进行了优化。结果表明，当乙醇22%(质量)、碳酸钾26%(质量)时，发酵液中2,3-丁二醇的回收率达到最高值97%，此时，乙偶姻和残余还原糖的回收率为97%和87%，菌体和蛋白的去除率分别为99%和94%，而丙酮酸、柠檬酸、苹果酸、延胡索酸和琥珀酸的去除率高达100%，这为2,3-丁二醇的工业分离提供了一种新的技术。

关键词

2,3-丁二醇 双水相萃取 有机酸 发酵液

分类号

Aqueous two-phase extraction of 2,3-butanediol by ethanol/potassium carbonate system from Dioscore zingiberensis fermentative broths

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Abstract

Aqueous two-phase extraction of 2,3-butanediol from fermented broths was investigated by using ethanol/potassium carbonate system. The bioconversion of saccharified hydrolyzate of *Dioscorea zingiberensis* into 2,3-butanediol was carried out by *Klebsiella pneumoniae*. The partitioning experiment indicated that the optimal conditions for aqueous two-phase extraction of 2,3-butanediol from the fermentation broth clarified by hollow fiber membrane were 22% (mass) of ethanol and 26% (mass) of potassium carbonate. Under this optimal condition, aqueous two-phase extraction of 2,3-butanediol was carried out directly from the fermentation broth without filtration. The recoveries of 2,3-butanediol and acetoin in the top phase as well as reducing sugar in the bottom phase were 97%, 97% and 87%, respectively. The removal rates of cells and proteins were 99% and 94%,respectively. Pyruvic acid, citric acid, malic acid, fumaric acid and butane diacid were partitioned into the bottom phase. Aqueous two-phase system of ethanol/potassium carbonate exhibited a great potential in the industrial separation of 2,3-butanediol.

Key words

2 3-butanediol aqueous two-phase extraction organic acids fermentative broths

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