

分离工程

接枝丙烯酸亲水化改性聚砜超滤膜及其在多肽分离中的应用

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摘要 采用丙烯酸亲水化改性聚砜中空纤维超滤膜。以四氯化锡为催化剂, 磷酸为催化助剂, 通过检测接触角, 优化了丙烯酸浓度与催化剂量 (摩尔比1:0.05)、反应温度 (30°C) 和反应时间 (60min) 等改性条件。红外光谱检测表明羧基被成功地接枝于膜表面; 扫描电镜分析说明表面改性未对膜面和膜骨架造成损坏。通过超滤不同浓度的牛血清白蛋白 (BSA) 溶液, 证明改性膜 (MM) 比未改性膜 (UMM) 具有更好的抗蛋白吸附性能。将MM应用于酪蛋白酶解物活性多肽的分离制备时, 优势体现于长期操作中较高的渗透通量与渗透液中更为合理的分子量分布两方面。

关键词

[丙烯酸](#) [超滤](#) [亲水聚砜膜](#) [抗吸附](#) [多肽分离](#)

分类号

Hydrophilic surface modification of polysulfone hollow fiber membrane by acrylic acid treatment and its application to peptide separation

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Abstract

Hydrophilic surface modification of polysulfone hollow fiber membrane was performed by acrylic acid treatment. Stannic chloride was selected as the proper catalyst, and phosphoric acid as the co-catalyst. The modification conditions, such as the ratio of the reagents (acrylic acid: catalyst=1:0.05), temperature (30°C) and reaction time (60 min), were optimized based on the contact angle measurements. The grafting of carboxyl group to the membrane surface was confirmed by IR spectrum and wettability analysis, and no degradation of the modified membrane skin or framework was observed with scanning electron microscopy. The experimental results of filtrating bovine serum albumin solutions indicated that the property of resisting protein adsorption on the membrane surface for the modified membrane was much better than that for unmodified membrane. In the process of separating casein hydrolysates, the advantages of modified membrane were also shown by comparing the permeate flux and molecular mass distribution with those of unmodified membrane.

Key words

[acrylic acid](#) [ultra-filtration](#) [hydrophilic polysulfone membrane](#) [anti protein adsorption](#) [peptide separation](#)

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