

研究论文

无孔单分散亲水性强阳离子交换固定相的制备及其在蛋白质快速分离中的应用研究

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摘要 采用分散聚合法制备小颗粒种子及“一步种子溶胀聚合”法成功地制备了粒径为3.0 μm的无孔单分散亲水性交联聚甲基丙烯酸环氧丙酯树脂,其表面经水解、环氧化、再水解后与氯磺酸反应,制备了一种新型的强阳离子交换色谱填料(SCX)。详细考察了该填料对标准蛋白质的分离性能及流动相中盐的种类、有机溶剂、流速等对蛋白质保留的影响。实验结果表明,在流速为4 mL/min时,采用线性梯度洗脱,1.0 min内可快速分离4种标准蛋白质,蛋白质的保留符合阳离子交换色谱规律。将SCX应用于快速纯化鸡蛋清中的溶菌酶和猪心中的细胞色素-C,取得了较好的效果。

关键词 [无孔单分散亲水性聚合物微球](#) [强离子交换色谱](#) [蛋白质分离](#)

分类号

Preparation of Strong Cation Exchange Packings Based on Monodisperse Hydrophilic Non-Porous Resins and Their Application for Fast Separation of Proteins

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Abstract

Monodisperse, 3.0 μm non-porous hydrophilic poly (glycidylmethacrylate-co-ethylenedimethacrylate) particles were prepared by an one-step swelling and polymerization method. The particles were modified to be a strong cation exchange (SCX) stationary phase for high performance liquid chromatography (HPLC) in the following steps. First, the particles were completely hydrolyzed. Second, the hydrolyzed particles were treated with epichlorhydrin followed by another hydrolysis of the newly introduced epoxide groups. Third, the particles were reacted with chlorosulfonic acid. The SCX stationary phase was evaluated in light of the ion exchange property, separability and hydrophilicity on the separation and retention of proteins in detail. Four proteins were quickly separated in 1.0 min with linear gradient elution using the synthesized SCX stationary phase. It was found that it followed ion exchange chromatographic (IEC) retention mechanism. The SCX resin was used for the fast purification of lysozyme from egg white and cytochrome-C from pig heart in 3.0 min with only one step. The results obtained were satisfactory.

Key words [monodisperse non-porous hydrophilic polymeric beads](#) [strong cation exchange chromatography](#) [proteins separation](#)

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