CELLULOSE MEMBRANE USED AS STATIONARY PHASE OF MEMBRANE AFFINITY CHROMATOGRAPHY

Wei GUO* Zhen Hua SHANG Yi Nian YU and Liang’ Mo ZHOU
Dalian Institute of Chemical Physics, Chinese Academy of Sciences
P.O. Box 100, Dalian 116012

SUMMARY
Cellulose membrane was used as stationary phase of affinity chromatography. A method for the preparation of micropore cellulose membrane from cellulose film is described. Triazine dyes, Cibacron Blue F3GA and Active Red K2BP were immobilized as affinity ligands. Up to 100 mg Cibacron Blue F3GA can be coupled onto 1 g membrane matrix. A membrane cartridge containing blue affinity membranes was also prepared. The flux of the cartridge was much superior to that of column packed with agarose as separation medium. On this cartridge, the chromatography of human serum albumin was performed.

INTRODUCTION
Affinity chromatography is a unique method in the separation technology since it is the only technique that enables the purification of almost any biomolecule on the basis of its own biological functions rather than individual physical or chemical properties. The high specificity of affinity chromatography is due to the strong interaction between ligand and the biomolecule separated. On the other hand, because of the strong interaction, the procedure of elution of biomolecule may be very difficult and time consuming, which are very harmful to the activity recovery of samples. To solve this problem, a new affinity chromatographic procedure named membrane affinity chromatography (MAC), was introduced several years ago[1,2].

Membrane separation can process large amount of sample in a relatively short time, this advantage is due to its special interstructure which provides a much fast reaction kinetics system[3]. So the integration of membrane and affinity chromatography possesses a number of advantages over that of normal affinity chromatography using columns, especially in the time spending and activity recovery aspects[4].

One of the most important factors in the development of affinity chromatography is the development of solid supports. Also in the membrane affinity chromatography, the selection of membrane material and the preparation of membrane are dominant factors affecting chromatographic performance. Without doubt, the material used for the preparation of membrane must be a good matrix in affinity in addition to be a good membrane matrix. Comparing the common materials for affinity matrixes to that for membrane preparation, we can immediately choose cellulose as the best selection, which has long been used in membrane preparation and is good matrix for affinity.