

Centrifugal partition chromatography as a potential method of isolation and purification of amphiphilic substances from a solid-state fermentation process

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Streszczenie

Separating amphiphilic compounds from complex matrix is challenging. Surfactin, cyclic lipopeptides group, was used as a model to find the proper separation conditions and parameters. The aim of the work was to solve the emulsification plug problem in countercurrent partition chromatography (CPC). The selected solvent system was a composition of *n*-heptane/*n*-butanol/methanol/aqueous buffer (20 mM disodium phosphate with 50 mM NaCl) at a ratio of 2:3:2:3. Several elution method modifications were applied. The most important was an appropriate mobile phase flow rate adjustment (flow rate gradient), minimizing the risk of stationary phase leakage. During the CPC procedures, the hydrostatic pressure was monitored as a factor of stationary phase retention. The hydrostatic pressure indicated the biphasic system's stability. A flow rate of 2 ml/min resulted in column stabilization and peak resolution during chromatographic separation. In order to avoid uncontrolled leakage, the flow rate was increased gradually. At 3.5 ml/min, there was a small loss of the stationary phase as the hydrostatic pressure decreased from 32 to nearly 18 bar. After designing the method, it was tested with SU containing extracts obtained from SSF to show its effectiveness. Our results showed that the single dual-mode method can be used to remove matrix's impurities and separate surfactin as a mixture of homologues with more than 80% purity. Moreover, application of the double dual-mode method allows for the isolation of fractions containing individual surfactin homologues in amounts of about 70% of the sample, which makes it possible to conduct further biological research.

Słowa kluczowe

Surfactant, Surfactin, Purification, Centrifugal partition chromatography (CPC), Countercurrent chromatography (CCC), Emulsification, Sample plug

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