

Purification of Tacrolimus from Ascomycin using Simulated Moving bed Chromatography

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SMB (simulated moving bed) chromatography was developed to overcome the weakness of batch chromatographic process. SMB has been widely used in petrochemical, fine chemical, sugar separation and pharmaceutical industries because SMB has advantages in terms of high purity, low mobile-phase consumption and high productivity. Tacrolimus (FK-506) is an immunosuppressant and ascomycin (FK-520) is a by-product of tacrolimus production process. Separation process of tacrolimus and ascomycin has more difficult owing to same structure except their functional groups on 21st of carbon. In this study, we applied SMB to purify tacrolimus from ascomycin. We measured adsorption isotherm of tacrolimus and ascomycin in C18 columns using PIM (pulse input method), and the measured adsorption isotherms were confirmed by simulation (Aspen Chromatography™). Using Triangle theory, operating points were determined in triangle region with 15 to 20% safety margin. In the results, tacrolimus of 99.9% purity was obtained by using SMB chromatography.