

Determination of Adsorption Isotherms of Eicosapentaenoic Acid (EPA) and Fatty Acids for EPA Purification Using SMB (Simulated Moving Bed) chromatography

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Eicosapentaenoic acid (EPA) is an omega-3 fatty acid that can be used health supplement food for promoting function of brain and preventing other diseases. In order to design a SMB (Simulated Moving Bed) process for the purification of EPA from the mixture, the adsorption isotherms of EPA and other fatty acids may be measured accurately and precisely. In this study, C18 column (Packed with Ultrapure silica® and purchased from YMC) was employed for the measurement of adsorption behaviors of EPA and other fatty acids by single-step frontal analysis with the concentrations of 0.2, 0.4, 0.6, 0.8 and 1.0% mixture in methanol. Linear, pure Langmuir and competitive Langmuir models were considered for the isotherms of EPA and other fatty acids. In order to confirm the adsorption isotherm of EPA and other fatty acids, simulation studies were carried out. From comparison between experiment and simulation, the simulations by the linear and Langmuir isotherms agreed well with the experiments. Results of competitive Langmuir isotherms, however, were not fitted with experiments.