Design of SMB process with Anti-Langmuir and Langmuir-like adsorption isotherms

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The design methods of SMB operating condition have been studied by many researchers. It is, however, difficult to find optimum operating condition of SMB process because of the different migration velocities of solutes in each zone. The migration velocity is dependent on the adsorption isotherm, zone flow rates of liquid phase, and switching time of ports. The zone flow rates and switching time are linearly related to the migration velocity. But it is difficult to estimate the migration velocity of solute becasue the adsorption isotherm is in inverse proportion to the migration velocity and has nonlinear properties. In this study, we considered several anti-Langmuir isotherms and Langmuir-like isotherms to estimate the migration velocity of solute in the chromatographic column. With these parameters, it is newly proposed, new design method to optimize the operation of SMB process.