

The Study of the Retention Models for the Separation of ortho-xylene and para-xylene in Reverse-Phase Chromatography Using Solvent-Gradient Operation

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The solvent-gradient operations in a batch chromatography give significant improvements in term of the enrichment of products, the separation time and the solvent consumption as compared with the isocratic operations. A different mobile phase composition leads to a different retention behavior of solutes owing to different interactions between solute and stationary phase. This work studied about solvent-gradient operation of the reversed-phase chromatography for the separation of ortho-xylene and para-xylene. To estimate a correlation of isothermal adsorption equilibrium with varying solvent composition for ortho-xylene and para-xylene, multi-step frontal analysis experiments were carried out at five different mobile phase compositions, such as 45%, 50%, 60%, 75% and 90% of acetonitrile. And, it was confirmed that the correlations in a retention model for the solvent-gradient operation in the reversed-phase chromatography agree well with the experimental results by performing a simulation.