Numerical Approach of Solute Migration in Chromatographic Column for Linear Isotherm Case

의주원, 노경호*
인하대학교
(rowkho@inha.ac.kr*)

The solute migration in the chromatographic column is important to design a batch or continuous chromatographic separation process. In the real cases, it is more important to predict the band broadening which occurred by the axial dispersion and mass transfer kinetics. To predict the actual solute profiles in the column or effluent stream, numerical method have been used to solve nonlinear PDE. However, this method spent much time and expense. In this work, two different rate factors were used to predict the characteristics of the solute profiles. The first one is solute migration velocity, and the second one is the band broadening rate. The band broadening rate can be estimated by the apparent axial dispersion and the steepest slope of the concentration profile. In this work, four benzene derivatives were used as model solute, and two kinds of the mobile phases were used in reversed-phase liquid chromatography. The axial dispersion coefficients and the slope of the concentration profile were estimated from HETP and the conservation of total amount of solute.