Combinatorial model of chromatography applied on optimizing operational conditions in SEC

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The shape of the elution curves depends strongly on experimental conditions, in the rst place on polymer molecular weight, upon this, on concentration and ow-rate. e e ect of concentration is weak for polymers in theta solvents up to the concentrations of overloading. On the other hand, in good solvents, the concentration e ect is important. e e ective hydrodynamic volume of dissolved macromolecules decreases with increasing concentration. e decrease in the hydrodynamic volume is of solvated molecules with increasing concentration is an established experimental factor which theoretical explanation. e spatial distribution of the analyte with respect to the longitudinal axis of the separation system, developing in time, can be expressed by the binomial distribution. However, further treatments of this physical situation were approximative. e exact solution to the problem is obtained as the observation at a xed point (the detector) of this binomial distribution developing in time a er reaching the exclusion limit. is can be done numerically. e description of the concentration e ect on SEC elution curves is possible on the basis of the displacement- equilibrium model. is is based on

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