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## 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 first place on polymer molecular weight, upon this, on concentration and flow-rate. The effect of concentration is weak for polymers in theta solvents up to the concentrations of overloading. On the other hand, in good solvents, the concentration effect is important. The effective hydrodynamic volume of dissolved macromolecules decreases with increasing concentration. The decrease in the hydrodynamic volume of solvated molecules with increasing concentration is an established experimental factor which theoretical explanation. The 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. The exact solution to the problem is obtained as the observation at a fixed point (the detector) of this binomial distribution developing in time after reaching the exclusion limit. This can be done numerically. The description of the concentration effect on SEC elution curves is possible on the basis of the displacement-equilibrium model. This is based on the concept of a theoretical plate on which the equilibrium is formed between molecules of the analyte moving together with mobile phase (MP) and those anchored on the or penetrated into the pores of the stationary phase (SP). The simulation of the concentration effect is possible with partition coefficient calculated numerically for each plate at each displacement.

### Biography

Milos Netopilik has completed his Ph.D. at the age of 30 years from Institute of Macromolecular Chemistry and postdoctoral studies from Virginia Polytechnic Institute and Technical University. He has published more than 65 papers in reputed journals.

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