

Abstract Submitted
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A Mathematical Model Describing Gradient Focusing Methods for Trace Analytes¹ SANDIP GHOSAL, JON HOREK, Northwestern University — The problem of Gradient Focusing for concentrating trace analytes is considered. Variation of buffer viscosity, conductivity and possibly also the zeta potential, results in a focusing point where the electrophoretic velocity is balanced by the electroosmotic flow (EOF) and where the sample concentrates. The axial inhomogeneity also results in an induced pressure gradient that alters the EOF profile and therefore causes Taylor dispersion. The coupled hydrodynamics and transport problem leading to the achievement of a steady state is studied in the context of the lubrication approximation: all variations in the axial direction take place over a length scale very much larger than the characteristic channel width.

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