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# An Introduction to Phoretic Motions and Electrokinetic Phenomena in a Nanochannel/Microchannel

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## Abstract:

A brief introduction about phoretic motions where a colloidal particle, the linear size of which ranges from 1 nm to 1  $\mu\text{m}$ , is driven by an externally applied field, and that about the electrokinetic phenomena occurring in a nanochannel/microchannel are given in this lecture. The former focused on the electrophoresis and the diffusiophoresis of a charged particle dispersed in a salt containing liquid phase. The influence of the factors that are of practical significance on the phoretic behavior of a particle are investigated. These include, for example, the nature of a particle and that of the liquid phase, the temperature, the particle concentration, and the presence of a boundary. The potential applications of the latter, include, for instance, ion current rectification, resistive pulse sensing, and salinity gradient power are introduced. Factors capable of affecting the performance of a nanochannel/microchannel in these applications including, for example, the geometry and the nature of the nanochannel/microchannel, the type of salt in the liquid phase and its nature, the type of externally applied field, and the temperature are examined in detail. In addition to specific behaviors observed, possible mechanisms are also discussed in detail.

