

Electrokinetic Particle Transport In Micro Nanofluidics Direct Numerical Simulation Analysis Surfactant Science

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Electrokinetic Particle Transport In Micro

Electrokinetic Particle Transport in Micro-/Nanofluidics: Direct Numerical Simulation Analysis provides a fundamental understanding of electrokinetic particle transport in micro-/nanofluidics involving electrophoresis, dielectrophoresis, electroosmosis, and induced-charge electroosmosis. The book emphasizes the direct numerical simulation of electrokinetic particle transport phenomena, plus several supportive experimental studies.

Electrokinetic Particle Transport in Micro-/Nanofluidics ...

Electrokinetics has been one of the most promising tools to

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manipulate particles in micro-/nanofluidics. Therefore, a comprehensive understanding of the electrokinetic particle transport in micro-/nanoscale channels is crucial to the development of micro-/nanofluidic devices.

Electrokinetic Particle Transport in Micro-/Nanofluidics

Numerous applications of micro-/nanofluidics are related to particle transport in micro-/nanoscale channels, and electrokinetics has proved to be one of the most promising tools to manipulate particles in micro/nanofluidics. Therefore, a comprehensive understanding of electrokinetic particle transport in micro-/nanoscale channels is crucial to the

Electrokinetic Particle Transport in Micro-/Nanofluidics ...

Electrokinetic particle transport in micro-/nanofluidics : direct numerical simulation analysis Shizhi Qian, Ye Ai "This text, which was developed in part from some of the authors' most recent journal papers, includes a brief introduction of micro/nanofluidics and a mini review of the basic theories of DC-electrokinetics.

Electrokinetic particle transport in micro-/nanofluidics ...

Electrokinetic Particle Transport in Micro-/Nanofluidics: Direct Numerical Simulation Analysis provides a fundamental understanding of electrokinetic particle transport in micro-/nanofluidics involving electrophoresis, dielectrophoresis, electroosmosis, and induced-charge electroosmosis.

Electrokinetic particle transport in micro-/nanofluidics ...

Field effect control of particle electrokinetic transport in micro/nanofluidics Due to the full coupling of the fluid and particle dynamics, electrostatics, and ionic mass transport described by the model in Section 2.1 , the field effect control of the electrokinetic fluid flow, discussed in Section 4 , can be used to modulate the particle electrokinetic motion in micro/nanofluidic devices.

Field effect control of electrokinetic transport in micro ...

In this chapter, we review three common electrokinetic transport phenomena: electroosmosis, electrophoresis and

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dielectrophoresis. These can be utilized for flow, species and particle transport control applications in micro-fluidic systems.

Electrokinetic Transport Phenomena in Micro-Fluidics ...

Zeta potential is the electrical potential at the slipping plane. This plane is the interface which separates mobile fluid from fluid that remains attached to the surface. Zeta potential is a scientific term for electrokinetic potential in colloidal dispersions. In the colloidal chemistry literature, it is usually denoted using the Greek letter zeta (ζ), hence ζ -potential.

Zeta potential - Wikipedia

Electrokinetic phenomena are a family of several different effects that occur in heterogeneous fluids, or in porous bodies filled with fluid, or in a fast flow over a flat surface. The term heterogeneous here means a fluid containing particles. Particles can be solid, liquid or gas bubbles with sizes on the scale of a micrometer or nanometer.

Electrokinetic phenomena - Wikipedia

DIRECT CURRENT ELECTROKINETIC PARTICLE TRANSPORT IN MICRO/NANO-FLUIDICS YeAi Old Dominion University, 2011 Director Dr Shizhi Qian Electrokinetics has been widely used to propel and manipulate particles in micro/nano-fluidics The first part of this dissertation focuses on numerical and

Direct Current Electrokinetic Particle Transport in Micro

...

This book provides a fundamental understanding of the electrokinetic particle transport in micro/na-fluidics, involving electrophoresis, dielectrophoresis, electroosmosis and also induced-charge electroosmosis and electrophoresis.

Electrokinetic Particle Transport in Micro-/Nanofluidics ...

The investigation of electrokinetic particle transport in confined microchannels has practical significances in a variety of applications ranging from traditional gel electrophoresis to electrokinetic microfluidics-based lab-on-a-chip devices.

"ELECTROKINETIC TRANSPORT AND MANIPULATION OF

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PARTICLES IN ...

10.4 Observed electrokinetic potentials on microfluidic substrates 10.5 Modifying the zeta potential 10.6 Chemical and fluid-mechanical techniques for measuring interfacial properties 10.7 Summary 10.8 Supplementary reading 10.9 Exercises 11 Species and charge transport 11.1 Modes of species transport

Micro- and Nanoscale Fluid Mechanics: Transport in ...

colloidal suspensions confined in a microchannel, particle motion is generally induced by both electrophoretic force acting on the particle and electro-osmotic fluid motion arising from the surface charges at the channel walls. Electrokinetic transport of particles in micro-/nanochannels with simple geometries such as parallel-

DC Electrokinetic Particle Transport in an L-Shaped ...

ELECTROKINETIC TRANSPORT IN FLUIDIC MICRO- AND NANO-CHANNELS: A STUDY EXAMINING ELECTROKINETIC ENERGY CONVERSION AND DIELECTROPHORETIC PARTICLE SEPARATION. A Thesis Presented to the Graduate School of Clemson University In Partial Fulfillment of the Requirements for the Degree Master of Science Mechanical Engineering by Christian M. Davidson

Electrokinetic Transport in Micro- and Nano- Channels:A

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In this review we discuss the state of the art of the optical whole-field velocity measurement technique micro-scale Particle Image Velocimetry (μ PIV). μ PIV is a useful tool for fundamental research of microfluidics as well as for the detailed characterization and optimization of microfluidic applications in Fundamental Principles and Techniques in Microfluidics

Micro-Particle Image Velocimetry (μ PIV): Recent ...

Electrokinetic particle transport in micro-/nanofluidics : direct numerical simulation analysis. [Shizhi Qian; Ye Ai] -- "This text, which was developed in part from some of the authors' most recent journal papers, includes a brief introduction of micro/nanofluidics and a mini review of the basic theories of ...

Electrokinetic particle transport in micro-/nanofluidics ...

Transport in an Electrokinetic Valve This application presents an

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example of pressure driven flow and electrophoresis in a 3D micro channel system. Researchers often use a device similar to the one in this model as an electrokinetic sample injector in biochips to obtain well-defined sample volumes of dissociated acids and salts and to transport ...

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The electrokinetic transport behaviors of a particle in a microfluidic confined domain under thin electrical double layer (EDL) assumption are investigated. The focus is placed on transport velocity development of the particle.

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