Journal of the Serbian Chemical Society
JSCS-info@shd.org.rs • www.shd.org.rs/JSCS
J. Serb. Chem. Soc. 76 (9) 1337–1338 (2011)
JSCS–4207
UDC 537.363+539.196:532+536.7
Book review

BOOK REVIEW

Interfacial electrovicoelasticity and electrophoresis

Authors: JYH-PING HSU and ALEKSANDAR M. SPASIC

Published by CRC Press Taylor & Francis Group, 6000 Broken Sound Parkway NW, Suite 300, Boca Raton, FL 33487-2742

In contemporary hydrodynamic, electrodynamic and thermodynamic instabilities that occur at interfaces, it is important wisdom to believe that interfacial electroviscoelasticity and electrophoresis are a new science with adequate use in modern technology. They are connected with the interfaces of rigid and deformable particles in homo- and hetero-aggregate dispersed systems, such as emulsions, dispersoides, suspensions, nanopowders, foams, fluosols, polymer membranes, biocolloids and plasmas.

This book is published on 176 pages with 57 Figures, 5 Tables and 232 References, 147 for the first 5 Chapters and 85 for the 6th. The book also has an Author Index and a Subject Index.

The authors have collected six chapters that show the development of the theory of electroviscoelasticity and electrophoresis and the motivation for developing this theory. These chapters cover a wide range including: Classifications of Finely Dispersed Systems, Historical Review and Motivation, Theory of Electroviscoelasticity, Measurements, Implications and Electrophoresis.

Classifications (Chapter 1) are based on various phenomenological notions: the scales, geometry, and the origin of forces, physical-chemical processes and entities.

Historical Review and Motivation (Chapter 2) describe the pilot plant of uranium extraction from wet phosphoric acid. There are also subsections related to entrainment problems in solvent extraction, underlining the performance of demulsions, Marangoni instabilities and possible electrical analogies, and various constitutive models of liquids. Finally, authors introduced the terms “electroviscosity” and “electroviscoelasticity” of liquid–liquid interfaces.

Theory of electroviscoelasticity (Chapter 3) includes: previous work, structure: electrified interfaces – a new constitutive model of liquids and dynamics: physical formalism. Mathematical formalisms are also presented by the stretching tensor model and the van der Pol derivative model: the fractional approach.

Experiments (Chapter 4) confirm the theoretical predictions describing systems which include the generation of the physical model, measuring changes of electrical interfacial potential at interfaces and measuring the characteristic frequencies of the system. The results and discussion of the subsections and assembled measured, calculated and estimated data are given.

The implication and applications to the first and second philosophical breakpoints (Chapter 5) are discussed (particular entrainment problem is solvent extraction: breaking of emulsions).

Electrophoresis (Chapter 6), as very important electrokinetic phenomena, presents analytical tools for the characterization of the surface properties of colloid-sized particles as well as for separation and purification process in both laboratory and industrial investigations.

This welcome collection concerning electroviscoelasticity and electrophoresis provides an important survey of how and where interfacial and colloidal phenomena serve to advance the frontiers of numerous chemical manufacturing processes at the micro-, nano- and atto-scales, in one word to solve problems in solvent extraction operations and processes, colloid and interface science, chemical and biological sensors, electroanalytical methods and /or biology/biomedicine (hematology, genetics and electroneurophysiology). In addition, the second philosophical breakpoint could be applied in elucidation and research of spintronics, decoherence sensitivity, quantum particles entanglement, ionics, fractional-quantum Hall Effect, fluids, *etc*.

This book is aimed not only at those working in a specific area related to the considered phenomena, but also at general chemists, prospective researchers and graduate students with a basic knowledge of physical chemistry, electromagnetism, fluid mechanics, quantum mechanics and wave mechanics.

Bojan D. Djordjević*#
Faculty of Technology and Metallurgy
University of Belgrade

* E-mail: bojan@tmf.bg.ac.rs
# Serbian Chemical Society member.

Electrophoresis is the motion of dispersed particles relative to a fluid under the influence of a spatially uniform electric field. Electrophoresis of positively charged particles (cations) is sometimes called cataphoresis, while electrophoresis of negatively charged particles (anions) is sometimes called anaphoresis. The electrokinetic phenomenon of electrophoresis was observed for the first time in 1807 by Russian professors Peter Ivanovich Strakhov and Ferdinand Frederic Reuss at Moscow University Interfacial Electroviscoelasticity and Electrophoresis 1st Edition. by. Jyh-Ping Hsu (Author). â€º Visit Amazon's Jyh-Ping Hsu Page. Find all the books, read about the author, and more. See search results for this author. Are you an author? Principle of Electrophoresis. Electrophoresis is based on the phenomenon that most biomolecules exist as electrically-charged particles, possessing ionizable functional groups.Â Electrophoretic separation occurs when an electric field is applied between two electrodes, cathode, and anode, which are submerged in a buffer solution. The following equations describe the phenomena taking place during electrophoresis, i.e. the factors affecting the electrophoretic separation (Westermeier, et al., 2005; Walker, 2010). a. The electrophoresis setting drives the speed and direction of the particles to be separated. When an electric field is applied, voltage (V) or electric potential difference occurs. Interfacial electroviscoelasticity and electrophoresis. by Jyh-Ping Hsu. 0 Ratings. 0 Want to read. 0 Currently reading. 0 Have read. This edition was published in 2010 by Taylor & Francis in Boca Raton.Â Interfacial electroviscoelasticity and electrophoresis. 2010, Taylor & Francis. in English. 1439803528 9781439803523. aaaa. Not in Library. Libraries near you: WorldCat. Add another edition? Interfacial electroviscoelasticity and electrophoresis. Electrophoresis is a general term that describes the migration and separation of charged particles (ions) under the influence of an electric field. An electrophoretic system consists of two electrodes of opposite charge (anode, cathode), connected by a conducting medium called an electrolyte. The separation effect on the ionic particles results from differences in their velocity (v), which is the product of the particle's mobility (m) and the field strength (E)Â Electrophoresis of nucleic acids is used routinely at the lab bench for the isolation and manipulation of cloned DNA fragments. In addition, it is a critical component of many molecular biology protocols that assess the role and interaction of nucleic acids in cells and tissues.