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Electrical Phenomena at Interfaces Electrical Phenomena at Interfaces, Second Edition, Solid-Liquid Interfaces Electrical Phenomena at Interfaces, in Chemistry, Physics and Biology Interfacial Phenomena Electrical Phenomena at Interfaces Electrical Phenomena at Interfaces and Biointerfaces Critical Phenomena at Surfaces and Interfaces Critical Phenomena at Surfaces and Interfaces Electrical Phenomena at Interfaces, in Chemistry, Physics and Biology Interfacial Transport Phenomena Electrical Phenomena at Interfaces Non-Equilibrium Phenomena near Vapor-Liquid Interfaces Material-Tissue Interfacial Phenomena Interfacial Phenomena Theory of Colloid and Interfacial Electric Phenomena Dynamical Phenomena at Surfaces, Interfaces and Superlattices Surfactants and Interfacial Phenomena Interfacial Phenomena in Metals and Alloys Interfacial Transport Phenomena Measurement Techniques and Practices of Colloid and Interface Phenomena Language Change at the Interfaces Thin Film Phenomena Fluid Interfacial Phenomena Turbulence Phenomena Dynamical Phenomena at Surfaces, Interfaces and Superlattices Interfacial Phenomena and Colloid Stability Electrical Phenomena at Interfaces Interfaces, Phenomena, and Nanostructures in Lithium Batteries Molecular Interfacial Phenomena of Polymers and Biopolymers Transport Mediated by Electrified Interfaces Self-Assembly Processes at Interfaces Polymer Composite Materials — Interface Phenomena & Processes Physics and Chemistry of Interfaces Turbulence Phenomena : an Introduction to the Eddy Transfer of Momentum, Mass, and Heat, Particularly at Interfaces Electrical Phenomena at Metal-electrolyte Interfaces Perspectives in Materials Research Solid Surfaces, Interfaces and Thin Films Magnetic and Electronic Phenomena in Oxide Interfaces, Thin Films and Heterostructures Interfacial Phenomena and Convection

Revising, updating and expanding information on developments since the late 1980s, the second edition of this work presents practical, fundamental material on interfacial electric phenomena in acqueous and nonaqueous systems, as well as their relation to colloid stability. The book includes 15 additional chapters that reflect collaborative efforts with new experts in the field. Since the publication of the first edition of Interfacial Phenomena, the interest in interfaces and surfactants has multiplied, along with their applications. Experimental and theoretical advances have provided scientists with greater insight into the structure, properties, and behavior of surfactant and colloid systems. Emphasizing equilibrium phenomena, flow, transport, and stability, Interfacial Phenomena: Equilibrium and Dynamic Effects, Second Edition presents a concise and current summary of the fundamental principles governing interfacial interactions. This new edition features updated and expanded topics in every chapter. It highlights key experimental techniques that have expanded the scope of our understanding, such as in mass transfer, microstructure determination in colloidal dispersions, and surfactant–polymer interactions. Interfacial Phenomena, Second Edition reflects the progress scientists have made in understanding the surface chemistry and interfacial dynamics of colloid and surfactant systems. The book also illustrates the growing applicability of these systems in a variety of fields including pharmaceuticals, cosmetics, detergents, paints, agricultural chemicals, and foods. This book emphasises both experimental and theoretical aspects of surface, interface and thin film physics. Compa- red to the earlier editions, which bore the title "Surfaces and Interfaces of Solid Materials", the book now places more emphasis on thin films, including also their superconducting and ferromagnetic properties. The present 4th edition thus presents techniques of preparing well-defined solid surfaces and interfaces, fundamental aspects of adsorption and layer growth, as well as basic models for the descripti- on of structural, vibronic and electronic properties of sur- faces, interfaces and thin films. Because of their importan- ce for modern information technology, significant attention is paid to the electronic properties of semiconductor inter- faces and heterostructures. Collective phenomena , such as superconductivity and ferromagnetism, also feature promi- nently. Experimental sections covering essential measurement and preparation techniques are presented in separate panels. Theory of Colloid and Interfacial Electric Phenomena is written for scientists, engineers, and graduate students who want to study the fundamentals and current developments in colloid and interfacial electric phenomena, and their relation to stability of suspensions of colloidal particles and nanoparticles in the field of nanoscience and nanotechnology. The primary purpose of this book is to help understand how the knowledge on the structure of electrical double layers, double layer interactions, and electrophoresis of charged particles will be important to understand various interfacial electric phenomena and to improves the reader's skill and save time in the study of interfacial electric phenomena. Also providing theoretical background and interpretation of electrokinetic phenomena and many approximate analytic formulas describing various colloid and interfacial electric phenomena, which will be useful and helpful to understand these phenomena analyse experimental data. Showing the fundamentals and developments in the field First book to describe electrokinetics of soft particles Providing theoretical background and interpretation of electrokinetic phenomena Using combinations of in situ and ex situ experimental methods, fundamental and relevant phenomena such as adsorption and desorption of ions and molecules, restructuring of surfaces, thin film and nanocluster growth, and electrochemical reactions on the micrometer scale are addressed. The overview includes a wide range of experimental techniques and examples of solid-liquid interfaces and aims at stimulating an expansion of this important type of interface science. New technologies demand new materials. Polymer composites, with their wide range of possible fillers and polymers, open the way to an enormous range of materials with differing chemical, physical, and mechanical properties. The ultimate goal of polymer composite research is to formulate procedures that will lead to the design of composites with preset, i.e. specified, properties. Based on many years' experience in the field, the authors prepare the way towards just such a design procedure. The key element is the analysis and classification of the state of the filler-polymer interfaces from the point of view of their acid-base adsorption interactions. These interfacial phenomena play a pivotal role in determining overall properties of the composite: its rheological behaviour, its structural properties, catalytic effects in polymerization and polycondensation, and other technological characteristics. The book discusses and evaluates the extensive previous research scattered throughout the literature in Eastern Europe and the West, presents numerous experimental studies, and sets new benchmarks for the analysis of polymer composites. The book is required for researchers wanting to keep abreast of the progress in the burgeoning fields of polymer analysis and design. This book bridges three different fields: nanoscience, bioscience, and environmental sciences. It starts with fundamental electrostatics at interfaces and includes a detailed description of fundamental theories dealing with electrical double layers around a charged particle, electrokinetics, and electrical double layer interaction between charged particles. The stated fundamentals are provided as the underpinnings of sections two, three, and four, which address electrokinetic phenomena that occur in nanoscience, bioscience, and environmental science. Applications in nanomaterials, fuel cells, electronic materials, biomaterials, stems cells, microbiology, water purificiaion, and humic substances are discussed. Interfacial Phenomena examines the fundamental properties of various liquid interfaces. This book discusses the physics of surfaces; electrostatic and electrokinetic phenomena; and adsorption at liquid interfaces. The properties of monolayers; reactions at liquid surfaces; diffusion through interfaces; and disperse systems and adhesion are also deliberated. Other topics include the vapor pressures over curved surfaces; electrical capacity of the double layer; applications of electrophoresis; and thermodynamics of adsorption and desorption. The experimental methods of spreading films at the oil-water interface; penetration into monolayers; experiments on dynamic systems; and spontaneous emulsification are likewise covered in this text. This book is beneficial to chemical engineers and students concerned with interfacial phenomena. Material-Tissue Interfacial Phenomena: Contributions from Dental and Craniofacial Reconstructions explores the material/tissue interfacial phenomena using dental and craniofacial reconstructions as a model system. As the mouth is a particularly caustic environment, the synthetic and/or bio-enabled materials used to repair damaged tissues and restore form, function, and esthetics to oral structures must resist a variety of physical, chemical, and mechanical challenges. These challenges are magnified at the interface between dissimilar structures such as the tooth/material interface. Interfacial reactions at the atomic, molecular, and nano-scales initiate the failure of materials used to repair, restore, and reconstruct dental and craniofacial tissues. Understanding the phenomena that lead to failure at the interface between dissimilar structures, such as synthetic materials and biologic tissues, is confounded by a variety of factors that are thoroughly discussed in this comprehensive

book. Provides a specific focus on the oral environment Combines clinical views and basic science into a useful reference book Presents comprehensive coverage of material-interfacial phenomena within the oral environment This book presents information on the development of a non-equilibrium approach to the study of heat and mass transfer problems using vapor-liquid interfaces, and demonstrates its application to a broad range of problems. In the process, the following peculiarities become apparent: 1. At vapor condensation on the interface from gas-vapor mixture, non-condensable components can lock up the interface surface and condensation stops completely. 2. At the evolution of vapor film on the heater in superfluid helium (He-II), the boiling mass flux density from the vapor-liquid interface is effectively zero at the macroscopic scale. 3. In problems concerning the motion of He-II bridges inside capillaries filled by vapor, in the presence of axial heat flux the He-II bridge cannot move from the heater as would a traditional liquid, but in the opposite direction instead. Thus the heater attracts the superfluid helium bridge. 4. The shape of liquid-vapor interface at film boiling on the axis-symmetric heaters immersed in liquid greatly depends on heat flux in the interface. Thus a new type of hydrostatic problems appears when in contrast to traditional statements the shape of the liquid-vapor interface has a complex profile with a point of inflection and a smooth exit on a free liquid surface. Revising, updating and expanding information on developments since the late 1980s, the second edition of this work presents practical, fundamental material on interfacial electric phenomena in acqueous and nonaqueous systems, as well as their relation to colloid stability. The book includes 15 additional chapters that reflect collaborative efforts with new experts in the field. This volume offers an up-to-date survey of linguistic phenomena at the interfaces between syntax and prosody, information structure and discourse – with a special focus on Germanic and Romance – and their role in language change. The contributions, set within the generative framework, discuss original data and provide new insights into the diachronic development of long-burning issues such as negation, word order, quantifiers, null subjects, aspectuality, the structure of the left periphery, and extraposition. The first part of the volume explores interface phenomena at the intrasentential level, in which only clause-internal factors seem to play a significant role in determining diachronic change. The second part examines developments at the intersentential level involving a rearrangement of categories between at least two clausal domains. The book will be of interest for scholars and students interested in generative accounts of language change phenomena at the interfaces, as well as for theoretical linguists in general. Transport Mediated by Electrified Interfaces provides an overview of the innovative use of electro-kinetic phenomena in experimentally exploring non-equilibrium regions of chemically non-reacting systems. Transport phenomena mediated by charged liquid-liquid interfaces and solid-liquid interfaces are also covered. Transport phenomena mediated by electrified interfaces are discussed in the context of a number of important areas, including, soil/water systems, phase transfer catalysis, animal/plant physiology and mimicking taste/smell sensing mechanisms. Provides an overview of the innovative use of electro-kinetic phenomena Discusses conventional electro-kinetics and other transport phenomena mediated by charged interfaces Of special interest to those working in the area of interface science The main objective of this volume is to demonstrate the importance of the fundamental aspects of interfacial phenomena in various industrial applications.The textprovides the reader with the knowledge that is essential for thecomposition of the complex multi-phase systems used in the above mentioned areas of application. It should enable the physical and formulation chemist as well as the chemical engineer in designing the formulation on the basis of a rational approach. It will also enable the formulation scientist to better understanding the factors responsible for producing a stable product with optimum application conditions. The book should also be very useful for teaching the subject of formulation at academic institutions. Self-Assembly Processes at Interfaces: Multiscale Phenomena provides the conceptual and unifying view of adsorption, self-assembly, and grafting processes at solid–liquid and liquid–gas interfaces, also describing experimental methods where applicable. An invaluable resource for (post)-graduate students looking to bridge the gap between acquiring the field’s existing knowledge and the creation of new insights, the book recalls fundamental concepts, giving rigorous, but first-principle-based, calculations and exercises, and showing how these concepts have been used in recent research articles. Readers will find guidelines on how best to start research in the field of surface chemistry with biological macromolecules and molecules able to undergo self-assembly process at interfaces in the presence of a liquid, along with discussions on the very fundamental aspects and applications using concepts of biomimetic chemistry. By highlighting the interdisciplinary aspects of the field of self-assembly at interfaces, the book is an ideal resource for chemical engineers, chemists, physicists, and biologists. In addition, important equations are demonstrated on the basis of fundamental concepts, and overly complex mathematical developments are avoided. Presents an interdisciplinary work that is ideal for chemical engineers, chemists, physicists, and biologists Provides a unifying view of the field, from fundamentals, to methods and applications Includes concepts applicable at both solid–liquid and liquid–gas interfaces Transport phenomena is used here to descril>e momentum, energy, mass, and entropy transfer (Bird et al. 1960, 1980). It includes thermodynamies, a special case of which is thermostatics. Interfacial transport phenomena refers to momentum, energy , mass, and entropy transfer within the immediate neighborhood of a phase interface, including the thermodynamies of the interface. In terms of qualitative physical observations, this is a very old field. Pliny the EIder (Gaius Plinius Secundus, 23-79 A.D.; Pliny 1938) described divers who released small quantities of oil from their mouths, in order to damp capillary ripples on the ocean surface and in this way provide more uniform lighting for their work. Similar stories were retold by Benjamin Franklin, who conducted experiments of his own in England (V an Doren 1938). In terms of analysis, this is a generally young field. Surface thermostatics developed relatively early, starting with Gibbs (1948) and continuing with important contributions by many others (see Chapter 5). This book deals with the application of grazing angle x-ray and neutron scattering to the study of surface-induced critical phenomena. With the advent of even more advanced synchrotron radiation sources and new sophisticated instrumentation this novel technique is expected to experience a boom. The comprehensive and detailed presentation of theoretical and experimental aspects of the scattering of evanascent x-ray and neutron waves inside a solid makes this book particularly useful for tutorial courses. Particular emphasis is put on the use of this technique to extract microscopic information (correlation functions) from the real structure of a surface, from buried and magnetic interfaces and from surface roughness. Physics and Chemistry of Interfaces Comprehensive textbook on the interdisciplinary field of interface science, fully updated with new content on wetting, spectroscopy, and coatings Physics and Chemistry of Interfaces provides a comprehensive introduction to the field of surface and interface science, focusing on essential concepts rather than specific details, and on intuitive understanding rather than convoluted math. Numerous high-end applications from surface technology, biotechnology, and microelectronics are included to illustrate and help readers easily comprehend basic concepts. The new edition contains an increased number of problems with detailed, worked solutions, making it ideal as a self-study resource. In topic coverage, the highly qualified authors take a balanced approach, discussing advanced interface phenomena in detail while remaining comprehensible. Chapter summaries with the most important equations, facts, and phenomena are included to aid the reader in information retention. A few of the sample topics included in Physics and Chemistry of Interfaces are as follows: Liquid surfaces, covering microscopic picture of a liquid surface, surface tension, the equation of Young and Laplace, and curved liquid surfaces Thermodynamics of interfaces, covering surface excess, internal energy and Helmholtz energy, equilibrium conditions, and interfacial excess energies Charged interfaces and the electric double layer, covering planar surfaces, the Grahame equation, and limitations of the Poisson-Boltzmann theory Surface forces, covering Van der Waals forces between molecules, macroscopic calculations, the Derjaguin approximation, and disjoining pressure Physics and Chemistry of Interfaces is a complete reference on the subject, aimed at advanced students (and their instructors) in physics, material science, chemistry, and engineering. Researchers requiring background knowledge on surface and interface science will also benefit from the accessible yet in-depth coverage of the text. Turbulence Phenomena provides an introduction to the eddy transfer of momentum, mass, and heat, specifically at interfaces. The approach of the discussion of the subject matter is based on the eddy mixing length concept of Prandtl. Chapter 1 begins with a discussion on basic concepts regarding liquid flow such as viscosity, turbulent flows, and velocities. As concepts and theories are established, the book then discusses the eddy transfer in fluids, specifically eddy transfer of mass and heat within fluids and eddy transfer near solid surfaces. The concept of eddies in different surfaces is discussed in length all throughout numerous chapters. These different surfaces include clean gas-liquid surfaces, clean liquid-liquid interfaces, and film-covered surfaces. The last few chapters focus on the more detailed discussion on turbulence, such as the concept of spontaneous interfacial turbulence and emulsification and turbulent dispersion and coalescence. The book will be of great use to undergraduate students of chemical engineering, physics, and chemistry. Contents: The Science of Materials Cohesive Properties of Solids Magnetism and Magnetic Materials Electrical, Optical and Thermal Properties of Solids Diffusion and Mass Transport in Solids Phase Transformations in the Solid State Growth, Structure, and Morphology of Crystals Mechanical Behavior of Crystalline Solids Surface Phenomena - The Nature and Properties of Solid Surfaces and Interfaces Structure and Properties of Liquids Effects of Radiation on Materials Techniques and Instrumentation. This is an extensively revised second edition of "Interfacial Transport Phenomena", a unique presentation of transport phenomena or continuum mechanics focused on momentum, energy, and mass transfer at interfaces. It discusses transport phenomena at common lines or three-phase lines of contact. The emphasis is upon achieving an in-depth understanding based upon first principles. It includes exercises and answers, and can serve as a graduate level textbook. This book deals with the application of grazing angle x-ray and neutron scattering to the study of surface-induced critical phenomena. With the

advent of even more advanced synchrotron radiation sources and new sophisticated instrumentation this novel technique is expected to experience a boom. The comprehensive and detailed presentation of theoretical and experimental aspects of the scattering of evanascent x-ray and neutron waves inside a solid makes this book particularly useful for tutorial courses. Particular emphasis is put on the use of this technique to extract microscopic information (correlation functions) from the real structure of a surface, from buried and magnetic interfaces and from surface roughness. This book is the premier text on the properties and applications ofsurfactants. The third edition is completely updated and revised,including new information on gemini surfactants (a new type ofpowerful surfactant), superspreading (or superwetting) by aqueoussurfactant solutions of highly hydrophobic surfaces (important inagricultural applications), and dynamic surface tension (animportant interfacial property not covered in the first twoeditions). * Clearly explains the mechanisms by which surfactants operate ininterfacial processes * Uses a minimum of mathematics in explanation of topics, making iteasy-to-understand and very user-friendly * Problems are included at the end of each chapter * Includes many tables of data as reference that are not compiledelsewhere * Milton J Rosen is an expert in the field of Surfactant research Leading contributors describe state-of-the-art research in experimental and theoretical liquid interfacial phenomena. Areas covered include the intrinsic interface, dynamics at a liquid-vapour interface, structure and properties of the liquid-vapour interface of a simple metal, the electric double layer, light-scattering at the fluid interface, statistical mechanics of spherical surfaces, and properties of water layers adjacent to interfaces. This book is a manual of measurement of colloids and interfaces designed especially for new researchers who have just begun research on these topics. The book is written by active researchers in the field of colloids and interfacial chemistry, based on the practical experience of the authors. In each chapter, the key points of measurement, how to analyze data correctly, points to be careful about, and merits of a particular method are concisely explained from the point of view of the readers. Not only in industries such as cosmetics and pharmaceuticals but also in academic studies of nanotechnology, correct understanding of colloid and interface phenomena is vital because the properties of these items, however small, are affected by the nature of interfaces. This book will be particularly useful for researchers who are not yet fully confident of the measurement techniques that are clearly explained here. . Revising, updating and expanding information on developments since the late 1980s, the second edition of this work presents practical, fundamental material on interfacial electric phenomena in acqueous and nonaqueous systems, as well as their relation to colloid stability. The book includes 15 additional chapters that reflect collaborative efforts with new experts in the field. Interfacial phenomena driven by heat or mass transfer are widespread in science and various branches of engineering. Research in this area has become quite active in recent years, attributable in part, at least, to the entry of physicists and their sophisticated experimental techniques into the field. Until now, however, the field has lacked a readable account of the recent developments. Interfacial Phenomena and Convection remedies this problem by furnishing a self-contained monograph that examines a rich variety of phenomena in which interfaces pay a crucial role. From a unified perspective that embraces physical chemistry, fluid mechanics, and applied mathematics, the authors study recent developments related to the Marangoni effect, including patterned convection and instabilities, oscillatory/wavy phenomena, and turbulent phenomena. They examine Bénard layers subjected to transverse and longitudinal thermal gradients and phenomena involving surface tension gradients as the driving forces, including falling films, drops, and liquid bridges. It is only in the past two or three decades that researchers have performed suitable, clear-cut experiments involving interfacial phenomena, and the stage is now set for a virtual explosion of the field. Interfacial Phenomena and Convection will bring you quickly up to date on the advances realized and prepare you to both use the results and to make further advances. This book combines three fundamental areas of interest to the science and engineering community, these being material science, nanotechnology and molecular engineering. Although there have been various results published in this field, there has yet to be a fully comprehensive review. This book covers key research on molecular mechanisms and thermodynamic behaviour of (bio)polymer surfaces and interfaces, from theoretical and experimental perspectives.

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- Interfacial Phenomena
- Electrical Phenomena At Interfaces
- Electrical Phenomena At Interfaces And Biointerfaces
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