

Surfactants And Colloids In The Environment

[#surfactants in environment](#) [#colloids in environment](#) [#environmental chemistry](#) [#water treatment](#) [#environmental pollution](#)

Understanding the behavior of surfactants and colloids in the environment is crucial for addressing various pollution challenges. These substances play significant roles in the transport, fate, and remediation of contaminants in soil and water. Studying their interactions and impact allows for the development of more effective strategies for environmental monitoring, risk assessment, and sustainable management practices.

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Surfactants and Colloids in the Environment

Surfactants and Colloids in the Environment presents the proceedings of the General Meeting of the German Colloid Society (Kolloid-Gesellschaft) held at the Research Center of Jülich (KFA), FRG, in 1993. The volume emphasizes the importance of colloid chemistry in environmental research. Contributions on the physico-chemical behavior of colloids and surfaces in environmental technology demonstrate the high standard and usefulness of colloid science in this field: General colloid and environmental science complement each other. Thus, the detailed contributions in this volume will be useful toward solving some environmental problems.

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Manipulation of Groundwater Colloids for Environmental Restoration

This valuable resource discusses several strategies of manipulating colloids for environmental restoration, identifies advantages and disadvantages of each strategy, and considers obstacles limiting the application of each strategy. Approaches evaluated include the following: Chemical modification of sub-surface systems to mobilize or deposit colloids in situ Altering the mobility of microorganisms to improve

delivery of microbes for bioremediation Manipulating colloids or biocolloids (bacteria) to change aquifer permeability to either enhance bioremediation or create in situ barriers Introducing modified colloids, surfactants, and emulsions to control colloid mobility or to increase recovery of sorbed contaminants by pump and treat methods Manipulation of Groundwater Colloids for Environmental Restoration also contains short, focused research reports on specific studies relevant to the various approaches under consideration. Subjects covered range from mobility of organic macromolecules by controlled field injection experiments to new techniques that investigate surface chemistry and aggregation of inorganic colloids. Other topics discussed include the depositional behavior and transport of biocolloids in porous media, surfactants as modifiers of surface binding sites on colloids, and genetic engineering of microorganisms to serve as contaminant-scavenging biocolloids. Manipulation of Groundwater Colloids for Environmental Restoration is an excellent resource for research scientists in hydrology, chemistry, and microbiology; environmental consultants; regulators; environmental engineers; bioremediation microbiologists; and engineers.

The Role of Colloidal Systems in Environmental Protection

The Role of Colloidal Systems in Environmental Protection describes the importance of colloids in many applications that contribute to environmental protection, including drinking water and wastewater treatment, heavy metal remediation, treatment of radioactive materials, corrosion, and energy conversion. Knowledge of the physical and chemical composition of colloids is important to understand and accurately model the relevant processes. The book familiarizes the reader with the technological features of the application of colloids in environmental protection, and provides chemical engineers, researchers, and scientists in academic and corporate communities with the latest developments in this field. Each chapter covers the whole spectrum of the relevant science, from the fundamentals to applications. Provides the applied technological features of colloids in environmental protection Gives insight into the use of bio-solid colloids as contaminant carriers Covers the natural occurrence of bio-surfactants in the environment and their applications Provides information on the use of nanoparticles for environmental applications Chapters written by recognized and respected experts in the field from all over the world

Handbook of Detergents, Part B

The second installment of the multivolume Handbook of Detergents deals with the potential environmental impact of detergents as a result of their production, formulation, usage, consumption, and disposal. This volume forms a comprehensive treatise on the multidimensional issues involved and emphasizes the alignment of scientific knowledge with the

Surface and Colloid Science

This volume includes 58 contributions to the 11th International Conference on Surface and Colloid Science, a highly successful conference sponsored by the International Association of Colloid and Interface Scientists and held in Iguassu Falls, Brazil, in September 2003. Topics covered are the following: Biocolloids and Biological Applications, Charged Particles and Interfaces, Colloid Stability, Colloidal Dispersions, Environmental Colloidal Science, Interfaces and Adsorption, Nanostructures and Nanotechnology, Self-Assembly and Structured Fluids, Surfactants and Polymers, Technology and Applications, Colloids and Surfaces in Oil Production. Surface and colloid science has acquired great momentum during the past twenty years and this volume is a good display of new results and new directions in this important area.

Detergents and the Environment

Offers coverage of the environmental behaviour of detergent additives, focusing on physiochemical interactions with soil and sediments. This text presents the current state of knowledge on recently introduced detergent additives, including zeolites, polycarboxylate compounds, ethylene dinitrilotetraacetic acid (EDTA), and nitrilotriacetic acid (NTA)

Environmental and Human Safety of Major Surfactants

The book summarizes and reviews the environmental and human safety of two classes of nonionic surfactants-alcohol ethoxylates (AE) and alkylphenol ethoxylates (APE). This unique resource contains critical data from published sources as well as from unpublished studies submitted by Soap and

Detergent Association member companies. It reviews information on product chemistry and analysis, biodegradation, environmental levels (including fate and distribution), aquatic toxicity, and human safety. Recently developed analytical techniques for the extraction, separation, detection, and measurement of nonionic surfactants and their metabolites in environmental samples are described. Results of biodegradation studies performed with a variety of test systems are tabulated, as are results of field studies at wastewater treatment plants. Reported comparisons of environmental levels with results of acute and chronic aquatic toxicity tests are provided. The information on the toxicity and irritation potential of AE and APE surfactants includes data from in vitro, mammalian, and human studies.

Surface Chemistry of Surfactants and Polymers

This book gives the reader an introduction to the field of surfactants in solution as well as polymers in solution. Starting with an introduction to surfactants the book then discusses their environmental and health aspects. Chapter 3 looks at fundamental forces in surface and colloid chemistry. Chapter 4 covers self-assembly and 5 phase diagrams. Chapter 6 reviews advanced self-assembly while chapter 7 looks at complex behaviour. Chapters 8 to 10 cover polymer adsorption at solid surfaces, polymers in solution and surface active polymers, respectively. Chapters 11 and 12 discuss adsorption and surface and interfacial tension, while Chapters 13- 16 deal with mixed surfactant systems. Chapter 17, 18 and 19 address microemulsions, colloidal stability and the rheology of polymer and surfactant solutions. Wetting and wetting agents, hydrophobization and hydrophobizing agents, solid dispersions, surfactant assemblies, foaming, emulsions and emulsifiers and microemulsions for soil and oil removal complete the coverage in chapters 20-25.

Biodegradability of Surfactants

The awareness and development of 'biodegradable' surfactants pre-dates current pressures by the environmental movement by nearly three decades, wherein a responsible industry mutually agreed to replace 'hard', non-biodegradable components of household detergents by 'soft', biodegradable alternatives, without course to legislation. The only requirement at that time was for surfactants used in detergents to exhibit a 'primary biodegradability' in excess of 80%; this referring to the disappearance or removal from solution of the intact surface active material as detected by specified analytical techniques. This proved useful, as observed environmental impacts of surfactants, e.g. visible foam on rivers, are associated with the intact molecule. Test methods for 'primary biodegradability' were eventually enshrined in EU legislation for nonionic surfactants (Directive 82/1242/EEC, amended 73/404/EEC) and for anionic surfactants (Directive 82/1243/EEC, amended 73/405/EEC). No approved test methods and resultant legislation have been developed for cationic and amphoteric surfactants to date. The environmental classification of chemical substances, which of course includes surfactants, and associated risk assessment utilises a second criterion 'ready biodegradability'. This may be assessed by a number of methods which monitor oxygen uptake (BOD), carbon dioxide production or removal of dissolved organic carbon (DOC). Some surfactants which comply with the above Detergents Directive are borderline when it comes to 'ready biodegradability'.

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Surfactants

This book presents detailed fundamentals of surfactant systems and links these fundamentals to emerging perspectives in the field of surfactant science. Key topics include environmentally friendly surfactants, ionic liquid-based surfactants, chemically enhanced oil recovery, synergy of surfactants with clay minerals, and reactions in microheterogeneous surfactant systems. This book is an excellent resource for students, researchers, and industry professionals.

Surfactant-enhanced Subsurface Remediation

Provides a timely and thorough review of surfactant-based remediation technologies. Covers fundamental mechanistic studies to scale-up and process modeling and full-scale field implementation studies. Summarizes the technical, economic, and sociopolitical issues affecting widespread implementation of these technologies. Includes contributions from academic and industrial researchers as well as regulatory personnel.

Biosurfactants for a Sustainable Future

Biosurfactants for a Sustainable Future Explore the state-of-the-art in biosurfactant technology and its applications in environmental remediation, biomedicine, and biotechnology Biosurfactants for a Sustainable Future explores recent developments in biosurfactants and their use in a variety of cutting-edge applications. The book opens a window on the rapid development of microbiology by explaining how microbes and their products are used in advanced medical technology and in the sustainable remediation of emerging environmental contaminants. The book emphasizes the different techniques that are used for the production of biosurfactants from microorganisms and their characterization. Various aspects of biosurfactants, including structural characteristics, developments, production, bio-economics and their sustainable use in the environment and biomedicine, are addressed, and the book also presents metagenomic strategies to facilitate the discovery of novel biosurfactants producing microorganisms. Readers will benefit from the inclusion of: A thorough introduction to the state-of-the-art in biosurfactant technology, techniques, and applications An exploration of biosurfactant enhanced remediation of sediments contaminated with organics and inorganics A discussion of perspectives for biomedical and biotechnological applications of biosurfactants A review of the antiviral, antimicrobial, and antibiofilm potential of biosurfactants against multi-drug-resistant pathogens. An examination of biosurfactant-inspired control of methicillin-resistant *Staphylococcus aureus* Perfect for academic researchers and scientists working in the petrochemical industry, pharmaceutical industry, and in the agroindustry, Biosurfactants for a Sustainable Future will also earn a place in the libraries of scientists working in environmental biotechnology, environmental science, and biomedical engineering.

Cationic Surfactants

This work focuses on the environmental availability and effects, toxicological properties and numerous applications of cationic surfactants, detailing the modern analytical processes by which this important class of compounds may be studied. It discusses the types of microorganisms that are susceptible or refractory to the actions of cationic agents.

Environmental Impact

This volume reviews the recent developments in the behavior of surfactant-modified, water-soluble polymers in aqueous solutions. The use of water-soluble polymers in biodegradable and biological systems and the development of unique hydrogels and new nonassociative water-soluble polymers is also discussed. This volume will be valuable reading for polymer chemists and engineers interested in personal care products, coatings, and detergents. Scientists interested in petroleum recovery and water treatment will also find this book useful.

Hydrophilic Polymers

An understanding of the fate and behaviour of organic chemicals, such as surfactants, in the environment is a prerequisite for the sustainable development of human health and ecosystems. As surfactants are being produced in huge amounts, it is important to have a detailed knowledge about their lifetime in the environment, their biodegradability in wastewater treatment plants and in natural waters, and their ecotoxicity. Parameters relevant for the assessment of long-term behaviour, such

as interactions with hormonal systems need to be understood to avoid unexpected adverse effects to future generations of people and the environment. However, the identification and quantification of commercial surfactants in the environment is made more complicated and cumbersome because they comprise of tens to hundreds of homologues, oligomers and isomers of anionic, nonionic, cationic and amphoteric compounds. The EU-funded PRISTINE project (Priority surfactants and their toxic metabolites in wastewater effluents: An integrated study; ENV4-CT97-0494) provides the basis for the content of this title. It provides policy makers and industry with detailed information on analysis and concentrations of surfactants and their degradation products in the environment. In addition to a general introduction to surfactants, this book comprises a comprehensive variety of analytical techniques, including sample handling, for the analysis of surfactants in the aquatic environment. Readers will find all the necessary information for analyzing the different groups of surfactants, with special emphasis on transformation products. Quality assurance is also reported on in detail. Chapters on toxicity and risk assessment are also included and give a complete perspective on the surfactants problem in the aquatic environment. · Presents the finding of EU-funded research into fate and behaviour of organic chemicals in the environment · Comprises a comprehensive variety of analytical techniques, including sample handling, for the analysis of surfactants in the aquatic environment · Provides relevant information to all groups working in the field of surfactants

Analysis and Fate of Surfactants in the Aquatic Environment

This volume will be summarized on the basis of the topics of Ionic Liquids in the form of chapters and sections. It would be emphasized on the synthesis of ILs of different types, and stabilization of amphiphilic self-assemblies in conventional and newly developed ILs to reveal formulation, physicochemical properties, microstructures, internal dynamics, thermodynamics as well as new possible applications. It covers: Topics of ionic liquid assisted micelles and microemulsions in relation to their fundamental characteristics and theories Development bio-ionic liquids or greener, environment-friendly solvents, and manifold interesting and promising applications of ionic liquid based micelles and microemulsions

Surfactant Enhancements

This book demonstrates the benefits of using commercially available surfactants, or surface-active agents, for remediation of metal-contaminated soil and sediment. First the book offers theoretical reviews of commercially available surfactants, then it proceeds to a study of various available surfactants for the mobilization of metals. Surfactants representative of amphiphiles discovered in the digestive environment of sediment-ingesting organisms are used to examine the extent and rate of metal (Al, Fe, Cd, Cu, Mn, Ni, Pb, Sn, Zn) mobilization from contaminated estuarine sediment. Metals can cause harmful effects to the environment and organisms. It is difficult to treat contaminants that are often tightly bound to the extremely small size of the estuarine sediments. The book also demonstrates the mechanisms of metal mobilization that appear to be related to complexation with monomers and adsorption to micelles of the anionic amphiphiles, and to the denudation of hydrophobic host phases or coatings on the sediment by micelles of both anionic and nonionic surfactants. Readers obtain a better understanding of current commercial surfactants, their impact on the environment, and possible remediation. This transdisciplinary book contributes toward Sustainable Development Goals numbers 6 (Clean Water and Sanitation) and 13 (Climate Action) set by the United Nations and is useful for students and teachers of sediment studies, coastal studies, environmental sciences, hydrology, civil engineering, and policy sciences.

Ionic Liquid-Based Surfactant Science

Over the last thirty years, the study of liquids containing polymers, surfactants, or colloidal particles has developed from a loose assembly of facts into a coherent discipline with substantial predictive power. These liquids expand our conception of what condensed matter can do. Such structured-fluid phenomena dominate the physical environment within living cells. This book teaches how to think of these fluids from a unified point of view, showing the far-reaching effects of thermal fluctuations in producing forces and motions. Keeping mathematics to a minimum, the book seeks the simplest explanations that account for the distinctive scaling properties of these fluids. An example is the growth of viscosity of a polymer solution as the cube of the molecular weight of the constituent polymers. Another is the hydrodynamic radius of a colloidal aggregate, which remains comparable to its geometrical radius even though the density of particles in the aggregate becomes arbitrarily small. The

book aims for a simplicity, unity and depth not found in previous treatments. The text is supplemented by numerous figures, tables and problems to aid the student.

Commercial Surfactants for Remediation

Over the last thirty years, the study of liquids containing polymers, surfactants, or colloidal particles has developed from a loose assembly of facts into a coherent discipline with substantial predictive power. These liquids expand our conception of what condensed matter can do. Such structured-fluid phenomena dominate the physical environment within living cells. This book teaches how to think of these fluids from a unified point of view showing the far-reaching effects of thermal fluctuations in producing forces and motions. Keeping mathematics to a minimum, the book seeks the simplest expl.

Structured Fluids

Microbial biosurfactants are green molecules with high application potential in environmental and industrial sectors. Chemical diversity of biosurfactants allows them versatility and broad range surfactants capability without compromising performance or economic viability. Biosurfactants are used as emulsifiers, dispersants, wetting agents, oil recovery agents, biopesticides, stabilizers, solubilizers, and bioremediation agents (pesticide, heavy metals and oil spill cleanup). This comprehensive book on biosurfactants and their environmental and industrial applications offers a broad spectrum of information on potential applications of biosurfactants in various fields and related technological developments.

Structured Fluids

Nanoparticles and nano-sized materials created by nanotechnology (NT) have been considered unique and sole solutions to overcome the limitations of other technologies and widen their applications. Although these materials have been widely used in environmental technology (ET), most environmental applications of nanoparticles were limited to the fabrication of nano-sensors for the detection of volatile organic compounds (VOC) and as nano-sized catalysts for air purification systems. As a result, the use of nanoparticles for the direct removal of pollutants from contaminated soil and wastewater has seldom been reported. However, environmental processes for soil remediation, wastewater treatment, and air purification strongly need innovative new materials to highly improve their performance and efficiency. So, demands for materials created by NT in ET are stronger than ever. Advances in Nanotechnology and the Environment presents the possible applications of nano-sized materials in all environmental processes, providing the most reliable guideline for the selection of nanomaterials to improve the efficiency of environmental processes. It focuses on the design of specific nanomaterials for environmental processes and pollutants. It presents the impact and influence of nanomaterials on the environment and discusses how to avoid causing secondary contamination by the use of nanomaterials. The book provides proper information about nanomaterials for potential users who will use and apply nanomaterials in ET.

Microbial Biosurfactants and Their Environmental and Industrial Applications

Green Sustainable Process for Chemical and Environmental Engineering and Science: Green Inorganic Synthesis provides an in-depth review of the synthesis of inorganic materials utilizing green chemistry protocols. It summarizes the green synthesis methods used for the preparation, processing and development of inorganic materials. The methods for the synthesis of various inorganic materials includes microwaves, sonochemical, electrochemical, bioinspired, enzyme mediated, sol-gel, solid state, etc. It also includes green-solvents driven inorganic material synthesis using ionic liquids, supercritical fluids, plant-derived materials, and microorganisms. The content of this book provides useful information which may be used to inspire the readers to new synthetic routes for sustainable inorganic synthesis. This book brings together panels of highly-accomplished experts in the field of inorganic chemistry. It is a unique book, extremely well structured and essential resource for undergraduate, postgraduate students, faculty, R&D professionals, production chemists, environmental engineers, and industrial experts. Essential study guide for inorganic chemical synthesis Provides a broad overview of eco-friendly methods in inorganic synthesis Bestows the latest advances in inorganic synthetic protocols Provides key references and details in each synthesis technique/methods Outlines eco-friendly inorganic synthesis and chemical processes using microwave, sonochemical and solid-state techniques

Advances in Nanotechnology and the Environment

Biosurfactants, derived from microbes and plants, exhibit diverse properties that help in emulsifying and foaming processes. With applications in pharmaceuticals, cosmetics, and agriculture, they also show antimicrobial and environmental benefits, such as oil removal in polluted areas. Biosurfactants show promise for pollution control and improving agriculture. This reference covers the basic science and major applications of biosurfactants. The book brings together contributions from experts in microbiology, cancer biology, pharmaceutical science, nanotechnology, plant biotechnology and environmental sciences into a single volume. The key features of the book are - Explains the basics of biosurfactants - Discusses novel applications of biosurfactants in the field of medicine, agriculture and environmental sustainability. - Includes special chapters that review the role of biosurfactants in environmental remediation and omics research - Includes detailed references in each chapter This book is an essential resource for learners and professional trainees who require knowledge about biosurfactants. It also provides information for anyone who is working on environmental sustainability projects.

Green Sustainable Process for Chemical and Environmental Engineering and Science

An understanding of the fate and behaviour of organic chemicals, such as surfactants, in the environment is a prerequisite for the sustainable development of human health and ecosystems. As surfactants are being produced in huge amounts, it is important to have a detailed knowledge about their lifetime in the environment, their biodegradability in wastewater treatment plants and in natural waters, and their ecotoxicity. Parameters relevant for the assessment of long-term behaviour, such as interactions with hormonal systems need to be understood to avoid unexpected adverse effects to future generations of people and the environment. However, the identification and quantification of commercial surfactants in the environment is made more complicated and cumbersome because they comprise of tens to hundreds of homologues, oligomers and isomers of anionic, nonionic, cationic and amphoteric compounds. The EU-funded PRISTINE project (Priority surfactants and their toxic metabolites in wastewater effluents: An integrated study; ENV4-CT97-0494) provides the basis for the content of this title. It provides policy makers and industry with detailed information on analysis and concentrations of surfactants and their degradation products in the environment. In addition to a general introduction to surfactants, this book comprises a comprehensive variety of analytical techniques, including sample handling, for the analysis of surfactants in the aquatic environment. Readers will find all the necessary information for analyzing the different groups of surfactants, with special emphasis on transformation products. Quality assurance is also reported on in detail. Chapters on toxicity and risk assessment are also included and give a complete perspective on the surfactants problem in the aquatic environment. · Presents the finding of EU-funded research into fate and behaviour of organic chemicals in the environment · Comprises a comprehensive variety of analytical techniques, including sample handling, for the analysis of surfactants in the aquatic environment · Provides relevant information to all groups working in the field of surfactants

Biosurfactants: A Boon to Healthcare, Agriculture & Environmental Sustainability

Most modern surfactants are readily biodegradable and exhibit low toxicity in the aquatic environment, the two criteria for green surfactants. However the majority are synthesised from petroleum, so over the past decade the detergent industry has turned its attention to developing greener routes to create these surfactants via renewable building blocks. Surfactants from Renewable Resources presents the latest research and commercial applications in the emerging field of sustainable surfactant chemistry, with emphasis on production technology, surface chemical properties, biodegradability, ecotoxicity, market trends, economic viability and life-cycle analysis. Reviewing traditional sources for renewable surfactants as well as recent advances, this text focuses on techniques with potential for large scale application. Topics covered include: Renewable hydrophobes from natural fatty acids and forest industry by-products Renewable hydrophiles from carbohydrates, amino acids and lactic acid New ways of making renewable building blocks; ethylene from renewable resources and complex mixtures from waste biomass Biosurfactants Surface active polymers This book is a valuable resource for industrial researchers in companies that produce and use surfactants, as well as academic researchers in surface and polymer chemistry, sustainable chemistry and chemical engineering.

Analysis and Fate of Surfactants in the Aquatic Environment

Growth of populations, increasing urbanization, and rising standards of living due to technological innovations demand not only the meticulous use of shrinking resources but also sustainable ways of producing materials for human welfare. Cleaner production involves preventive and protective initiatives which are intended to minimize waste and emissions and maximize product output. These novel microbiological techniques are a practical option for achieving environmental sustainability. Microbiology for Cleaner Production and Environmental Sustainability serves as a valuable source of information about microbiological advancements for a sustainability in diversified areas such as energy resources, food industries, agricultural production, and environmental remediation of pollution. Features: Covers key issues on the role of microbiology in the low-cost production of bioenergy Provides comprehensive information on microorganisms for maximizing productivity in agriculture Examines green pharmaceutical production Provides the latest research on microbiological advancements in the restoration of contaminated sites

Surfactants from Renewable Resources

Microbial biosurfactant compounds are a group of structurally diverse molecules produced by microorganisms, and are mainly categorized according to their chemical structure. The diversity of microbial biosurfactants makes them versatile and means that they offer a range of capabilities, while at the same time being economically sustainable. As such, they have potential applications in environmental processes, as well as in food, biomedicine and other industries. This book discusses innovative approaches and cutting-edge research that utilize the various properties of biosurfactants. Drawing on research from around the globe, it provides an up-to-date review of biosurfactant applications and their importance in fields such as medicine, gene therapy, immunotherapy, antimicrobial bioremediation and agriculture. It also discusses their anti-adhesive properties. The book will appeal to academics and researchers in the field of microbiology, as well as policymakers. It also serves as additional reading material for undergraduate and graduate students of agriculture, ecology, soil science, and environmental sciences.

Microbiology for Cleaner Production and Environmental Sustainability

The NATO Advanced Research Workshop "Role of Interfaces in Environmental Protection" has been held on May 27-30, 2002 in Miskolc, Hungary, under leadership of co-directors Prof Sandor Barany from the University of Miskolc, Hungary, and Prof Nataliya Klymenko, National Academy of Sciences of Ukraine. The objective of the ARW was to highlight colloidal and biocolloidal aspects of environmental pollution and technologies to monitor, remediate, abate and prevent pollution. It is known that the solution of majority of environmental problems is closely connected with phenomena at the interfaces. The behaviour, transport of dispersed particles in the environment, the main phase separation methods in water treatment, purification of liquids, aerosols removal, many soil remediation processes as well as the methods of protection of human organisms from hazardous matters, are based on concepts of colloid chemistry, i.e. properties of interfaces and their behaviour in different media. Examples of these methods are: filtration, ultrafiltration, flotation, coagulation, hetero-coagulation and flocculation, adsorption, adhesion of micro-organisms to surfaces, membrane separation methods, etc. A very important and special aspect of the topic is the human protection using colloid-chemical approaches, i.e. the adsorption, aggregation and adagulation properties of different materials. Examples are: adsorption of hazardous organic materials, drugs, heavy metals and radionuclides on activated carbon, silica, cellulose derivatives, etc.

Microbial Biosurfactants

This companion volume to Velde's Origin and Mineralogy of Clays deals with the role of clays in specific environmental issues, and is unique in its subject matter. Individual chapters are written by recognized international experts in their field, and cover such subjects as radioactive waste disposal, trace metals, soil quality and productivity, pesticides, landfill, fibrous minerals and health. The approach combines reviews with current research, making it an invaluable resource for students, researchers and practitioners alike.

Role of Interfaces in Environmental Protection

Colloid and Surface Chemistry is a subject of immense importance and implications both to our everyday life and numerous industrial sectors, ranging from coatings and materials to medicine and biotechnology. How do detergents really clean? (Why can't we just use water?) Why is milk "milky"?

Why do we use eggs so often for making sauces? Can we deliver drugs in better and controlled ways? Coating industries wish to manufacture improved coatings e.g. for providing corrosion resistance, which are also environmentally friendly i.e. less based on organic solvents and if possible exclusively on water. Food companies want to develop healthy, tasty but also long-lasting food products which appeal to the environmental authorities and the consumer. Detergent and enzyme companies are working to develop improved formulations which clean more persistent stains, at lower temperatures and amounts, to the benefit of both the environment and our pocket. Cosmetics is also big business! Creams, lotions and other personal care products are really just complex emulsions. All of the above can be explained by the principles and methods of colloid and surface chemistry. A course on this topic is truly valuable to chemists, chemical engineers, biologists, material and food scientists and many more.

Environmental Interactions of Clays

The Environmental Protection Agency (EPA) sponsors constant publication of the latest soil and groundwater contamination studies. Editor J. Russell Boulding has compiled the most recent and the best of these documents in the EPA Environmental Assessment Sourcebook. This book is required reading for both the novice and the experienced environmental academic or technician. Boulding's selections address the basic concepts of contaminant behavior through the newest sampling techniques. The EPA Environmental Assessment Sourcebook is an essential and convenient tool for anyone on the cutting edge of contamination detection, monitoring, and hopefully, someday, prevention.

Introduction to Applied Colloid and Surface Chemistry

Collection of selected, peer reviewed papers from the 2014 2nd International Conference on Advances in Energy and Environmental Science (ICAEES 2014), June 21-22, 2014, Guangzhou, China. The 398 papers are grouped as follows: Chapter 1: Environmental Chemistry and Biology, Chapter 2: Environmental Materials, Chapter 3: Environmental Safety and Health, Chapter 4: Environmental Planning and Assessment, Chapter 5: Environmental Analysis and Monitoring, Chapter 6: Environmental Restoration Engineering, Chapter 7: Environmental Protection and Ecological Environment Construction, Chapter 8: Pollution Control Engineering, Chapter 9: Waste Disposal and Recycling, Chapter 10: Water Supply and Drainage, Chapter 11: Hydrology and Water Resources Engineering, Chapter 12: Soil and Water Conservation and Desertification Control, Chapter 13: Forest Cultivation, Protection and Plant Protection, Chapter 14: Geographic Information Science and Remote Sensing, Chapter 15: Land Resources Environment and Urban Planning, Chapter 16: Mineral Prospecting and Exploration, Chapter 17: Mining Engineering, Chapter 18: Mineral Processing Engineering, Chapter 19: Oil and Gas Well Development Projects, Chapter 20: Storage and Processing of Agricultural Products, Chapter 21: Energy Saving, Environmental Protection, Low Carbon Ideas, Chapter 22: Environmental Protection and Economic Development, Chapter 23: Eco-Economy, Circular Economy, Low Carbon Economy

Current Awareness in Particle Technology

Perfluoroalkyl substances are compounds that have been around since the 1950s. Only recently has their adverse human health and ecological consequences become known. There are books that either investigate the chemistry or explore the toxicity of these compounds. This is the only book that will provide a holistic look at this very complex problem and will cover the toxicology, analytical, remediation, and regulatory perspectives, and how it affects everyone personally. The book will serve as a reference for practicing environmental engineers, regulators, toxicologist, researchers, and concerned members of the public.

EPA Environmental Assessment Sourcebook

Pollution and its control are now one of the most serious problems in environmental management, affecting localized areas, regions, and, increasingly, the entire ecosphere. Chemistry and Ecotoxicology of Pollution provides a basic understanding of the chemical, toxicological, and ecological factors involved when major classes of pollutants act on natural systems. The nature and effects of these pollutants are examined from the primary level of their sources and chemical properties, through their interactions in the environment, to their ultimate ecological effects on organisms and ecosystems. Pollutants are divided into groups, with similar properties, and then the chemistry and ecotoxicology of each group is defined. More importantly, in collating and evaluating available information on pollution processes, the book develops unifying theories on the fundamental chemical and ecological nature of

pollution processes. The book uses a conceptual framework to evaluate the impact of pollutants on the components and functions of natural ecosystems. It is based on the chemical and physical properties of a pollutant, its environmental behavior and fate, exposure to and toxic effects on organisms, their populations, communities, and responses of affected ecosystems. This sequence can be applied to known, potential, and emerging pollutants of concern. As government initiatives for the control of chemicals take greater effects, pollution research, particularly in ecotoxicology, will be further developed. Chemistry and Ecotoxicology of Pollution helps play an important role in determining the future direction of research activities in environmental management and pollution control on a worldwide scale. It is a basic resource for students (e.g. environmental chemistry, ecology, land and water management, environmental or public health, environmental engineering, and sustainability science), scientists, researchers, policy makers, and professionals in need of a clear understanding of the nature and effects of environmental pollution from an ecological perspective.

Environmental Protection and Resources Exploitation II

A comprehensive review of environmental remediation is presented with an emphasis on the role of clay minerals in water purification. In the first chapter, important aspects of environmental problems and possible solutions are discussed. In the second chapter, the application of natural clay minerals as environmental cleaning agents are explained. The discussion is focused on the role of different types of clay materials in hazardous substance removal from air, aqueous solutions, wastewater, aquaculture, ground water, etc. In the next chapter, the modification of clay materials is explored including the preparation of clay composite materials for environmental remediation. Various aspects of clay material modifications and the effects of clay surface chemistry on the removal of hazardous material is also discussed. Next, the equilibrium and kinetics of hazardous substance adsorption is presented. This chapter summarizes recent studies on the removal of hazardous substances from aqueous solutions and the environment using various types of clay minerals. The brief also includes various models used in adsorption studies and touches on the characterization of clay minerals.

Perfluoroalkyl Substances in the Environment

Chemistry and Ecotoxicology of Pollution