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Nanocolloids for Petroleum Engineering - Baghir A. Suleimanov 2022-08-08
Nanocolloids for Petroleum Engineering Enables readers to understand nanocolloids in upstream operations in the oil industry from an applied and theoretical point of view Nanocolloids for Petroleum Engineering brings together the background, latest advances, and practical and theoretical information about nanocolloids for petroleum engineering in one comprehensive volume. The text is structured in such a way to allow readers to easily distinguish key points and quickly gain the expertise they need to become more effective in their respective disciplines. For practical purposes and to aid in seamless reader comprehension, experiences of service companies, general guidance, and problem solving exercises are included throughout the text. The highly qualified authors specifically present the subject as petroleum experts and use a niche industry point of view, which means petroleum, reservoir, and drilling engineers will be able to quickly understand and digest the information contained within. Sample topics covered in the work include: A brief introduction to and classification of colloid systems, describing the main properties of nanocolloids crucial for practical application in petroleum engineering Nanocolloids application in reservoir engineering and development, illustrating reservoir conditions necessary for nanocolloids formation Nanocolloid applications in production operations, including the mechanism of nanoscale dispersion phase impact on physical properties of conventional substances utilized in upstream processes Nanocolloid application in Enhanced Oil Recovery (EOR) and the impact of nanoparticles on conventional displacement agents Nanocolloids for Petroleum Engineering serves as a comprehensive reference work and standalone guide for petroleum engineers who are interested in gaining knowledge surrounding nanocolloids and harnessing that knowledge to aid in solving a wide variety of conventional challenges in the field.

Environmental Informatics - 2022
This interdisciplinary book incorporates various aspects of environment, ecology, and natural disaster management including cognitive informatics and computing. It fosters research innovation and discovery on basic science and information technology for addressing various environmental problems, while providing the right solutions in environment, ecology, and disaster management. This book is a unique resource for researchers and practitioners of energy informatics in various scientific, technological, engineering, and social fields to disseminate original research on the application of digital technology and information management theory and practice to facilitate the global transition toward sustainable and resilient energy systems. Cognitive informatics is also the need of the hour and deals with cutting-edge and multidisciplinary research area that tackles the fundamental problems shared by modern informatics, computation, software engineering, AI, cybernetics, cognitive science, neuropsychology, medical science, systems science, philosophy, linguistics, economics, management science, and life sciences, which

this book also presents.

Sustainable Materials for Oil and Gas Applications - Cenk Temizel 2021-02-12

Sustainable Materials for Oil and Gas Applications, a new release in the Advanced Materials and Sensors for the Oil and Gas Industry series, comprises a list of processes across the upstream and downstream sectors of the industry and the latest research on advanced nanomaterials. Topics include enhanced oil recovery mechanisms of nanofluids, health and safety features related to nanoparticle handling, and advanced materials for produced water treatments. Supplied from contributing experts in both academic and corporate backgrounds, the reference contains developments, applications, advantages and challenges. Located in one convenient resource, the book addresses real solutions as oil and gas companies try to lower emissions. As the oil and gas industry are shifting and implementing innovative ways to produce oil and gas in an environmentally friendly way, this resource is an ideal complement to their work. Covers developments, workflows and protocols in advanced materials for today's oil and gas sectors Helps readers gain insights from an experienced list of editors and contributors from both academia and corporate backgrounds Address environmental challenges in oil and gas through technological solutions in nanotechnology

Gas Injection Methods - Zhaomin Li 2022-09-27

The Enhanced Oil Recovery Series delivers a multivolume approach that addresses the latest research on various types of EOR. The second volume in the series, Gas Injection Methods, helps engineers focus on the latest developments in one of the fastest growing areas. Different techniques are described in addition to the latest technology such as data mining and unconventional reservoirs. Supported field case studies are included to show a bridge between research and practical application, making it useful for both academics and practicing engineers. Structured to start with an introduction on various gas types and different gas injection methods, screening criteria for choosing gas injection method, and environmental issues during gas injection methods, the editors then advance on to more complex content, guiding the engineer into newer topics involving CO2 such as injection in tight oil reservoirs, shale oil reservoirs, carbonated water, data mining, and formation damage. Supported by a full spectrum of contributors, this book gives petroleum engineers and researchers the latest research developments and field applications to drive innovation for the future. Helps readers understand the latest research and practical applications specific to foam flooding and gas injection Provides readers with the latest technology, including nanoparticle-stabilized foam for mobility control and carbon storage in shale oil reservoirs Teaches users about additional methods such as data mining applications and economic and environmental considerations

Nonwood Plant Fibers for Pulp and Paper - Pratima Bajpai 2021-01-09

Nonwood Plant Fibers for Pulp and Paper examines the use of nonwood plant fibers for pulp and paper, worldwide pulping capacity of nonwood fibers, categories of non-wood raw materials, problems associated with the utilization of non-wood fibers, pulping, bleaching, chemical recovery and papermaking of nonwood raw materials, the use of nonwood plant fibers in specific paper and paperboard grades, and the advantages and drawbacks of using nonwood fiber for papermaking and future prospects. This book gives professionals in the field the most up-to-date and comprehensive information on the state-of- the-art techniques and aspects involved in pulp and paper making from nonwood plant fibers. Provides comprehensive coverage on all aspects of pulping and papermaking of non-wood fibers Covers the latest science and technology in pulping and papermaking of non-wood fibers Focuses on biotechnological methods, a distinguishing feature of this book and its main attraction Presents valuable references related to the pulp and papermaking industry

Nanofluids and Their Engineering Applications - K.R.V. Subramanian 2019-06-18

Nanofluids are solid-liquid composite material consisting of solid nanoparticles suspended in liquid with enhanced thermal properties. This book introduces basic fluid mechanics, conduction and convection in fluids, along with

nanomaterials for nanofluids, property characterization, and outline applications of nanofluids in solar technology, machining and other special applications. Recent experiments on nanofluids have indicated significant increase in thermal conductivity compared with liquids without nanoparticles or larger particles, strong temperature dependence of thermal conductivity, and significant increase in critical heat flux in boiling heat transfer, all of which are covered in the book. Key Features Exclusive title focusing on niche engineering applications of nanofluids Contains high technical content especially in the areas of magnetic nanofluids and dilute oxide based nanofluids Feature examples from research applications such as solar technology and heat pipes Addresses heat transfer and thermodynamic features such as efficiency and work with mathematical rigor Focused in content with precise technical definitions and treatment

Abstracts of Papers - American Chemical Society. Meeting (1996

Chemical Nanofluids in Enhanced Oil Recovery - Rahul Saha 2021-09-14

Sustainable world economy requires a steady supply of crude oil without any production constraints. Thus, the ever-increasing energy demand of the entire world can be mostly met through the enhanced production from crude oil from existing reservoirs. With the fact that newer reservoirs with large quantities of crude oil could not be explored at a faster pace, it will be inevitable to produce the crude oil from matured reservoirs at an affordable cost. Among alternate technologies, the chemical enhanced oil recovery (EOR) technique has promising potential to recover residual oil from matured reservoirs being subjected to primary and secondary water flooding operations. Due to pertinent complex phenomena that often have a combinatorial role and influence, the implementation of chemical EOR schemes such as alkali/surfactant/polymer flooding and their combinations necessitates upon a fundamental understanding of the potential mechanisms and their influences upon one another and desired response variables. Addressing these issues, the book attempts to provide useful screening criteria, guidelines, and rules of thumb for the identification of process parametric sets (including reservoir characteristics) and response characteristics (such as IFT, adsorption etc.,) that favor alternate chemical EOR systems. Finally, the book highlights the relevance of nanofluid/nanoparticle for conventional and unconventional reservoirs and serves as a needful resource to understand the emerging oil recovery technology. Overall, the volume will be of greater relevance for practicing engineers and consultants that wish to accelerate on field applications of chemical and nano-fluid EOR systems. Further, to those budding engineers that wish to improvise upon their technical know-how, the book will serve as a much-needed repository.

Chemical Enhanced Oil Recovery - Patrizio Raffa 2019-07-22

This book aims at presenting, describing, and summarizing the latest advances in polymer flooding regarding the chemical synthesis of the EOR agents and the numerical simulation of compositional models in porous media, including a description of the possible applications of nanotechnology acting as a booster of traditional chemical EOR processes. A large part of the world economy depends nowadays on non-renewable energy sources, most of them of fossil origin. Though the search for and the development of newer, greener, and more sustainable sources have been going on for the last decades, humanity is still fossil-fuel dependent. Primary and secondary oil recovery techniques merely produce up to a half of the Original Oil In Place. Enhanced Oil Recovery (EOR) processes are aimed at further increasing this value. Among these, chemical EOR techniques (including polymer flooding) present a great potential in low- and medium-viscosity oilfields. • Describes recent advances in chemical enhanced oil recovery. • Contains detailed description of polymer flooding and nanotechnology as promising boosting tools for EOR. • Includes both experimental and theoretical studies. About the Authors Patrizio Raffa is Assistant Professor at the University of Groningen. He focuses on design and synthesis of new polymeric materials optimized for industrial applications such as EOR, coatings and smart materials. He (co)authored about 40 articles in peer reviewed journals. Pablo Druetta

works as lecturer at the University of Groningen (RUG) and as engineering consultant. He received his Ph.D. from RUG in 2018 and has been teaching at a graduate level for 15 years. His research focus lies on computational fluid dynamics (CFD).

Biermann's Handbook of Pulp and Paper - Pratima Bajpai 2018-05-17

Biermann's Handbook of Pulp and Paper: Raw Material and Pulp Making, Third Edition is a comprehensive reference for industry and academia covering the entire gamut of pulping technology. This book provides a thorough introduction to the entire technology of pulp manufacture; features chapters covering all aspects of pulping from wood handling at the mill site through pulping and bleaching and pulp drying. It also includes a discussion on bleaching chemicals, recovery of pulping spent liquors and regeneration of chemicals used and the manufacture of side products. The secondary fiber recovery and utilization and current advances like organosolv pulping and attempts to close the cycle in bleaching plants are also included. Hundreds of illustrations, charts, and tables help the reader grasp the concepts being presented. This book will provide professionals in the field with the most up-to-date and comprehensive information on the state-of- the-art techniques and aspects involved in pulp making. It has been updated, revised and extended. Alongside the traditional aspects of pulping and papermaking processes, this book also focuses on biotechnological methods, which is the distinguishing feature of this book. It includes wood-based products and chemicals, production of dissolving pulp, hexenuronic acid removal, alternative chemical recovery processes, forest products biorefinery. The most significant changes in the areas of raw material preparation and handling, pulping and recycled fiber have been included. A total of 11 new chapters have been added. This handbook is essential reading for all chemists and engineers in the paper and pulp industry. Provides comprehensive coverage on all aspects of pulp making Covers the latest science and technology in pulp making Includes traditional and biotechnological methods, a unique feature of this book Presents the environmental impact of pulp and papermaking industries Sets itself apart as a valuable reference that every pulp and papermaker/engineer/chemist will find extremely useful

Enhanced Oil Recovery in Shale and Tight Reservoirs - James J.Sheng 2019-11-07

Oil Recovery in Shale and Tight Reservoirs delivers a current, state-of-the-art resource for engineers trying to manage unconventional hydrocarbon resources. Going beyond the traditional EOR methods, this book helps readers solve key challenges on the proper methods, technologies and options available. Engineers and researchers will find a systematic list of methods and applications, including gas and water injection, methods to improve liquid recovery, as well as spontaneous and forced imbibition. Rounding out with additional methods, such as air foam drive and energized fluids, this book gives engineers the knowledge they need to tackle the most complex oil and gas assets. Helps readers understand the methods and mechanisms for enhanced oil recovery technology, specifically for shale and tight oil reservoirs Includes available EOR methods, along with recent practical case studies that cover topics like fracturing fluid flow back Teaches additional methods, such as soaking after fracturing, thermal recovery and microbial EOR

Steam Generation from Biomass - Esa Kari Vakkilainen 2016-09-24

Steam Generation from Biomass: Construction and Design of Large Boilers provides in-depth coverage of steam generator engineering for biomass combustion. It presents the design process and the necessary information needed for an understanding of not only the function of different components of a steam generator, but also what design choices have been made. Professor Vakkilainen explores each particular aspect of steam generator design from the point-of-view of pressure part design, mechanical design, layout design, process design, performance optimization, and cost optimization. Topics such as fuels and their emissions, steam-water circulation, auxiliary equipment, availability and reliability, measurements and control, manufacture, erection, and inspection are covered. Special attention is given to recovery boilers and fluidized bed boilers, and automated design and dimensioning calculation

spreadsheets are available for download at the book's companion website. This book is intended for both design engineers and steam boiler operators, as well as those involved in plant management and equipment purchasing. Provides a complete overview of biomass steam boilers, including processes, phenomena, and nomenclature Presents a clear view of how biomass boilers differ from fossil fuel boilers Covers the most used types of large-scale biomass boilers, including recovery boilers, fluidized bed boilers, and auxiliary equipment Includes a companion website with spreadsheets, calculation examples, and automatic calculation tools for design and dimensioning

Oilfield Chemistry and its Environmental Impact - Henry A. Craddock 2018-05-11 Consolidates the many different chemistries being employed to provide environmentally acceptable products through the upstream oil and gas industry This book discusses the development and application of green chemistry in the oil and gas exploration and production industry over the last 25 years — bringing together the various chemistries that are utilised for creating suitable environmental products. Written by a highly respected consultant to the oil and gas industry — it introduces readers to the principles and development of green chemistry in general, and the regulatory framework specific to the oil and gas sector in the North Sea area and elsewhere in the world. It also explores economic drivers pertaining to the application of green chemistry in the sector. Topics covered in Oilfield Chemistry and its Environmental Impact include polymer chemistry, surfactants and amphiphiles, phosphorus chemistry, inorganic salts, low molecular weight organics, silicon chemistry and green solvents. It also looks at sustainability in an extractive industry, examining the approaches used and the other methodologies that could be applied in the development of better chemistries, along with discussions about where the application of green chemistry is leading in this industry sector. Provides the reader with a ready source of reference when considering what chemistries are appropriate for application to oilfield problems and looking for green chemistry solutions Brings together the pertinent regulations which workers in the field will find useful, alongside the chemistries which meet the regulatory requirements Written by a well-known specialist with a combined knowledge of chemistry, manufacturing procedures and environmental issues Oilfield Chemistry and its Environmental Impact is an excellent book for oil and gas industry professionals as well as scientists, academic researchers, students and policy makers.

Unconventional Shale Gas Development - Rouzbeh G. Moghanloo 2022-02-23 Unconventional Shale Gas Development: Lessons Learned gives engineers the latest research developments and practical applications in today's operations. Comprised of both academic and corporate contributors, a balanced critical review on technologies utilized are covered. Environmental topics are presented, including produced water management and sustainable operations in gas systems. Machine learning applications, well integrity and economic challenges are also covered to get the engineer up-to-speed. With its critical elements, case studies, history plot visuals and flow charts, the book delivers a critical reference to get today's petroleum engineers updated on the latest research and applications surrounding shale gas systems. Bridges the gap between the latest research developments and practical applications through case studies and workflow charts Helps readers understand the latest developments from the balanced viewpoint of academic and corporate contributors Considers environmental and sustainable operations in shale gas systems, including produced water management

Asphaltene Deposition Control by Chemical Inhibitors - Ali Ghamartale 2021-08-25 Asphaltene Deposition Control by Chemical Inhibitors: Theoretical and Practical Prospects is the most advanced reference focused on chemical dispersants and inhibitors from both an experimental and modeling viewpoint. Adequate knowledge of the effective parameters in each treatment method, interactions, mechanisms and economic viewpoints involved in asphaltene treatment are crucial for future development, recovery forecast, and reserve prediction, hence this reference delivers on all these aspects. Sections cover the environmental impacts of

asphaltene deposition, prevention methods, and experimental methods, both static and dynamic, to test the effectiveness of inhibitors on restricting asphaltene deposition. Rounding out with modeling methods used to simulate asphaltene-inhibitor interactions and a workflow to select suitable inhibitors by technical, economic and environmental considerations, this book will give today's engineers and researchers the right tool to mitigate formation damage in a sustainably responsible way. Focuses on inhibitors, mitigators and the interplay between the asphaltene-inhibitors Helps readers learn from experimental models and replicate treatments with screening workflows Includes case studies that help readers make sustainable and economically-sound decisions on treatments

A-Z of Biorefinery - Nuttha Thongchul 2021-11-19

A-Z of Biorefinery: A Comprehensive View provides a comprehensive book that highlights and illustrates important topics relating to biorefineries, including associated theory, current and future research trends, available techniques and future challenges. This book will benefit a wide range of audiences, including students, engineers, scientists, practitioners, and those who are keen to explore more on biorefinery. Sections cover the availability of current technologies, constraints, market trends, recent system developments, and the concepts that enable modern biorefineries to utilize all kinds of biomass. This book is an essential resource for students, scientists, engineers and practitioners working in industry and academia. Covers the most important topics relating to biorefineries Provides related definitions, theories, overviews of methods, applications and important references Offers perspectives and concise reviews for each section Includes complete design case studies with tutorials

Nanotechnology for CO2 Utilization in Oilfield Applications - Tushar Sharma 2022-06-15

Nanotechnology for CO2 Utilization in Oilfield Applications delivers a critical reference for petroleum and reservoir engineers to learn the latest advancements of combining the use of CO2 and nanofluids to lower carbon footprint. Starting with the existing chemical and physical methods employed for synthesizing nanofluids, the reference moves into the scalability and fabrication techniques given for all the various nanofluids currently used in oilfield applications. This is followed by various, relevant characterization techniques. Advancing on, the reference covers nanofluids used in drilling, cementing, and EOR fluids, including their challenges and implementation problems associated with the use of nanofluids. Finally, the authors discuss the combined application of CO2 and nanofluids, listing challenges and benefits of CO2, such as carbonation capacity of nanofluids via rheological analysis for better CO2 utilization. Supported by visual world maps on CCS sites and case studies across the industry, this book gives today's engineers a much-needed tool to lower emissions. Covers applications for the scalability and reproducibility of fabrication techniques for various nanofluids used in the oilfield, including visual world maps that showcase current stages and future CCS sites Helps readers understand CO2 case studies for subsurface applications, including CO2 injection into depleted reservoirs Provides knowledge on the existing challenges and hazards involved in CO2 for safer utilization

Statistical Methods in Control & Signal Processing - Tohru Katayama 2018-10-08

Presenting statistical and stochastic methods for the analysis and design of technological systems in engineering and applied areas, this work documents developments in statistical modelling, identification, estimation and signal processing. The book covers such topics as subspace methods, stochastic realization, state space modelling, and identification and parameter estimation.

Innovative Heat Exchangers - Hans-Jörg Bart 2017-12-30

This accessible book presents unconventional technologies in heat exchanger design that have the capacity to provide solutions to major concerns within the process and power-generating industries. Demonstrating the advantages and limits of these innovative heat exchangers, it also discusses micro- and nanostructure surfaces and micro-scale equipment, and introduces pillow-plate, helical and expanded metal baffle concepts. It offers step-by-step worked examples, which provide instructions for developing an initial configuration and are supported by clear,

detailed drawings and pictures. Various types of heat exchangers are available, and they are widely used in all fields of industry for cooling or heating purposes, including in combustion engines. The market in 2012 was estimated to be U$ 42.7 billion and the global demand for heat exchangers is experiencing an annual growth of about 7.8 %. The market value is expected to reach U$ 57.9 billion in 2016, and approach U$ 78.16 billion in 2020. Providing a valuable introduction to students and researchers, this book offers clear and concise information to thermal engineers, mechanical engineers, process engineers and heat exchanger specialists.

Nordic Pulp & Paper Research Journal - 2004

Foams - Huijin Xu 2020-09-23

Foams are ubiquitous in human life and can be found in a variety of products and materials, such as sodas and sponges. There are liquid foams and solid foams, both of which have distinct properties useful for various applications. This book reviews, researches, and summarizes the potential uses of foam fluids and porous foams in engineering, medicine, and other industries. Chapters discuss different types of foams including multiphase foams, cellular foams, and ceramic foams as well as foam-generating mechanisms and techniques.

Colloids and Interfaces in Oil Recovery - Spencer Taylor 2019-06-21

It is well-known that colloid and interface science and petroleum production are inextricably linked. Whether in the reservoir, with its porous structure, or during recovery, crude oil is intimately associated with rock surfaces and with water, often in the form of emulsions. This situation leads to highly complex systems, comprising multiple colloids and interfaces, which require to be optimized if oil is to be recovered efficiently, both in terms of economic cost and with due concern for the environment. This book contains a compilation of contemporary research topics which illustrate various aspects of the importance of colloids and interfaces in crude oil recovery through modifying conditions between the rock, crude oil, and water in the reservoir, in order to achieve improved oil recovery. The specific topics covered relate both to conventional oils, in which waterflooding is the most common secondary and tertiary means of recovery, and to non-conventional heavy oil and natural bitumen, which require thermal recovery methods, owing to their high viscosity.

Fundamentals of Enhanced Oil and Gas Recovery from Conventional and Unconventional Reservoirs - Alireza Bahadori 2018-08-18

Fundamentals of Enhanced Oil and Gas Recovery from Conventional and Unconventional Reservoirs delivers the proper foundation on all types of currently utilized and upcoming enhanced oil recovery, including methods used in emerging unconventional reservoirs. Going beyond traditional secondary methods, this reference includes advanced water-based EOR methods which are becoming more popular due to CO2 injection methods used in EOR and methods specific to target shale oil and gas activity. Rounding out with a chapter devoted to optimizing the application and economy of EOR methods, the book brings reservoir and petroleum engineers up-to-speed on the latest studies to apply. Enhanced oil recovery continues to grow in technology, and with ongoing unconventional reservoir activity underway, enhanced oil recovery methods of many kinds will continue to gain in studies and scientific advancements. Reservoir engineers currently have multiple outlets to gain knowledge and are in need of one product go-to reference. Explains enhanced oil recovery methods, focusing specifically on those used for unconventional reservoirs Includes real-world case studies and examples to further illustrate points Creates a practical and theoretical foundation with multiple contributors from various backgrounds Includes a full range of the latest and future methods for enhanced oil recovery, including chemical, waterflooding, CO2 injection and thermal

Microbial Enhanced Oil Recovery - Lalit Pandey 2021-10-21

This book presents the fundamentals of the reservoir and interfacial engineering. The book systematically starts with the basics of primary, secondary and tertiary (enhanced) oil recovery and emphasizes on the theory of microbial-enhanced oil recovery (MEOR) and its potential toward recovery of oil in place. Different

approaches of MEOR such as in-situ, ex-situ, and integration of chemical- and microbial-enhanced oil recovery (EOR) are discussed in detail. This book highlights the link between the effectiveness of MEOR and the local reservoir conditions, crude oil characteristics, and indigenous microbial community. The latest implementations of MEOR across the globe are highlighted as case studies to outline the potential as well as the scope of MEOR. Given the topics covered, this book will be useful for professionals and researchers working in the areas of petroleum science and engineering, chemical engineering, biotechnology, bioengineering, and other related fields.

Recovery Improvement - Qiwei Wang 2022-10-01

Oil and Gas Chemistry Management Series brings an all-inclusive suite of tools to cover all the sectors of oil and gas chemicals from drilling, completion to production, processing, storage, and transportation. The third reference in the series, Recovery Improvement, delivers the critical chemical basics while also covering the latest research developments and practical solutions. Organized by the type of enhanced recovery approaches, this volume facilitates engineers to fully understand underlying theories, potential challenges, practical problems, and keys for successful deployment. In addition to the chemical, gas, and thermal methods, this reference volume also includes low-salinity (smart) water, microorganism- and nanofluid-based recovery enhancement, and chemical solutions for conformance control and water shutoff in near wellbore and deep in the reservoir. Supported by a list of contributing experts from both academia and industry, this book provides a necessary reference to bridge petroleum chemistry operations from theory into more cost-efficient and sustainable practical applications. Covers background information and practical guidelines for various recovery enhancement domains, including chapters on enhanced oil recovery in unconventional reservoirs and carbon sequestration in CO2 gas flooding for more environment-friendly and more sustainable initiatives Provides effective solutions to control chemistry-related issues and mitigation strategies for potential challenges from an industry list of experts and contributors Delivers both up-to-date research developments and practical applications, featuring various case studies

Critical and Rare Earth Elements - Abhilash 2019-11-11

This book is aimed to compile the distribution of rare earth elements in various resources with their processing from secondary resources. It includes details of various processes developed for extraction of rare earth elements from varied raw materials ranging from e-wastes, tailings, process wastes and residues. It emphasizes importance of processing of the secondary resources to assist environmental remediation of such untreated wastes and get finished products. It covers all aspects of rare metals and rare earth metals in one volume covering extraction, separation and recycling of secondary resources for extraction of these metals along with relevant case studies.

Economically and Environmentally Sustainable Enhanced Oil Recovery - M. R. Islam 2020-03-17

There have been many books on the topic of Enhanced Oil Recovery (EOR) over the last 100 years. They all, however, focus on how to recover more oil faster, taking a rather myopic approach. The solutions presented all work fantastically in theory and even in the laboratory, but each fails to produce results in the field with long-term success. The petroleum industry is almost resigned to the belief that for an EOR technique to be successful, it must be propped up with public funds or must compromise environmental integrity. In line with modern engineering practices, previous books discuss how existing technologies can be tweaked to accommodate for any shortcomings that just came to light. This book is unlike any other book on the topic of recovery in particular and engineering in general. This groundbreaking volume is a continuation of the author’s and his research group’s work that started publishing on the subject of global sustainability involving energy and the environment, dating back to early 2000s. Starting with a paradigm shift in engineering that involves a long-term focus, rather than looking for short-term solutions, the methods and theories presented here delve into applying green engineering and zero waste principles to EOR. Historically, EOR has received mixed success, mainly because

innovations in these disciplines relied heavily on processed materials, which are both uneconomical and toxic to the environment. This book explains how engineers missed entirely the causes of unsustainability in these technologies due to the prevalence of many myths that are embedded in modern engineering. Once these myths are deconstructed, the appropriate technologies emerge and the merits of them both in terms of economic and environmental benefits become clear. The book reveals how previous practices in EOR can be replaced with their sustainable versions while saving in material costs. A number of innovative technologies are introduced that can render well known technologies, such as steam flood, in situ combustion, chemical flooding, and microbial EOR environmentally sustainable and economically attractive. A triple dividend is received once these technologies are applied in otherwise marginal reservoirs, unconventional plays and even abandoned formations. The overall reserve, which reflects recoverable oil with new technologies, goes up drastically. Further benefits are drawn when processes such as value addition of waste material is performed. Overall this book shows how EOR can be rendered green while increasing the profitability. This is in stark contrast to the past practices that considered environmental integrity as a drain on profitability. This book proves that a paradigm shift can turn a “technological disaster” into a technological marvel.

Energy Production and Management in the 21st Century V - S. Syngellakis 2022-07-19

The future of energy production, operation and management in a changing world was the focus of the 5th International Conference on Energy Production and Management. Papers presented at the meeting form this volume. A focus is placed on the comparison of conventional energy sources, particularly hydrocarbons, with a number of other ways of producing energy, emphasising new technological developments, based on renewable resources such as solar, hydro, wind and geothermal. Key to sustainability is the need to convert new sustainable sources of energy into useful forms (electricity, heat, fuel), while finding efficient ways of storage and distribution. In many cases, the challenges lie as much with the production of such renewable energy at an acceptable cost, including damage to the environment, as with the integration of those resources into the existing infrastructure. The changes required to progress from an economy based mainly on hydrocarbons to one taking advantage of sustainable energy resources are massive and require considerable scientific research as well as the development of advanced engineering systems. Such progress demands close collaboration between different disciplines in order to arrive at optimum solutions. Also discussed is the energy use of industrial processes, including the embedded energy contents of materials, such as those in the built environment. Energy production, operation, distribution and usage, result in environmental risks that need to be better understood. They are part of energy economics and relate to human environmental health as well as ecosystems behaviour. An emphasis is placed on the ways in which more efficient use can be made of conventional as well as new energy sources. This relates to savings in energy consumption, reduction of energy losses, as well as the implementation of smart devices and the design of intelligent distribution networks.

Water-Formed Deposits - Zahid Amjad 2022-03-24

Water-Formed Deposits: Fundamentals and Mitigation Strategies wholly presents the important issue of deposits in aqueous systems, both industrial and biological. By analyzing causes, mechanisms and mitigation strategies, the book helps researchers/engineers/end-users gain a fundamental understanding of the issues underlying deposit formation and mitigation. It covers numerous, fundamental aspects of water-formed deposits, while also giving an applications’ perspective. The book's goal is to assist the reader in his/her understanding of the important issues of scale formation, while also helping with potential solutions. Provides a fundamental understanding of deposit formation by presenting basic science and mechanisms Presents an “applications perspective Reveals a systematic overview of deposit-related challenges and their mitigation Correlates structure to performance in mitigation strategies Analyzes current legal aspects and regulations

Includes case studies from the “real industrial world for the industrial reader/end user
Selected Proceedings from the 232nd ECS Meeting: National Harbor, MD – Fall 2017 - Abbott 2017-12-22

Essentials of Polymer Flooding Technique - Antoine Thomas 2019-04-05
Provides an easy-to-read introduction to the area of polymer flooding to improve oil production The production and utilization of oil has transformed our world. However, dwindling reserves are forcing industry to manage resources more efficiently, while searching for alternative fuel sources that are sustainable and environmentally friendly. Polymer flooding is an enhanced oil recovery technique that improves sweep, reduces water production, and improves recovery in geological reservoirs. This book summarizes the key factors associated with polymers and polymer flooding—from the selection of the type of polymer through characterization techniques, to field design and implementation—and discusses the main issues to consider when deploying this technology to improve oil recovery from mature reservoirs. Essentials of Polymer Flooding Technique introduces the area of polymer flooding at a basic level for those new to petroleum production. It describes how polymers are used to improve efficiency of “chemical” floods (involving surfactants and alkaline solutions). The book also offers a concise view of several key polymer-flooding topics that can’t be found elsewhere. These are in the areas of pilot project design, field project engineering (water quality, oxygen removal, polymer dissolution equipment, filtration, pumps and other equipment), produced water treatment, economics, and some of the important field case histories that appear in the last section. Provides an easy to read introduction to polymer flooding to improve oil production whilst presenting the underlying mechanisms Employs “In A Nutshell” key point summaries at the end of each chapter Includes important field case studies to aid researchers in addressing time- and financial-consumption in dealing with this issue Discusses field engineering strategies appropriate for professionals working in field operation projects Essentials of Polymer Flooding Technique is an enlightening book that will be of great interest to petroleum engineers, reservoir engineers, geoscientists, managers in petroleum industry, students in the petroleum industry, and researchers in chemical enhanced oil recovery methods.

Hybrid Enhanced Oil Recovery Using Smart Waterflooding - Kun Sang Lee 2019-04-03
Hybrid Enhanced Oil Recovery Using Smart Waterflooding explains the latest technologies used in the integration of low-salinity and smart waterflooding in other EOR processes to reduce risks attributed to numerous difficulties in existing technologies, also introducing the synergetic effects. Covering both lab and field work and the challenges ahead, the book delivers a cutting-edge product for today’s reservoir engineers. Explains how smart waterflooding is beneficial to each EOR process, such as miscible, chemical and thermal technologies Discusses the mechanics and modeling involved using geochemistry Provides extensive tools, such as reservoir simulations through experiments and field tests, establishing a bridge between theory and practice
Managing the Environment, Managing Ourselves - Richard N. L. Andrews 2020-03-17
In the third edition of this definitive book, Richard N. L. Andrews looks back at four centuries of American environmental policy, showing how these policies affect contemporary environmental issues and public policy decisions, and identifying key policy challenges for the future. Andrews crafts a detailed and contextualized narrative of the historical development of American environmental policies and institutions. This volume presents an extensively revised text, with increased detail on the 50-year history of the modern environmental policy era and updated through the Obama and Trump administrations.

Chemical Methods - Abdolhossein Hemmati Sarapardeh 2021-11-30
Chemical Methods, a new release in the Enhanced Oil Recovery series, helps engineers focus on the latest developments in one fast-growing area. Different techniques are described in addition to the latest technologies in data mining and hybrid processes. Beginning with an introduction to chemical concepts and polymer flooding, the book then focuses on more

complex content, guiding readers into newer topics involving smart water injection and ionic liquids for EOR. Supported field case studies illustrate a bridge between research and practical application, thus making the book useful for academics and practicing engineers. This series delivers a multi-volume approach that addresses the latest research on various types of EOR. Supported by a full spectrum of contributors, this book gives petroleum engineers and researchers the latest developments and field applications to drive innovation for the future of energy. Presents the latest research and practical applications specific to chemical enhanced oil recovery methods Helps users understand new research on available technology, including chemical flooding specific to unconventional reservoirs and hybrid chemical options Includes additional methods, such as data mining applications and economic and environmental considerations

Artificial Intelligence and Data Analytics for Energy Exploration and Production - Fred Aminzadeh 2022-09-21

ARTIFICAL INTELLIGENCE AND DATA ANALYTICS FOR ENERGY EXPLORATION AND PRODUCTION This groundbreaking new book is written by some of the foremost authorities on the application of data science and artificial intelligence techniques in exploration and production in the energy industry, covering the most comprehensive and updated new processes, concepts, and practical applications in the field. The book provides an in-depth treatment of the foundations of Artificial Intelligence (AI) Machine Learning, and Data Analytics (DA). It also includes many of AI-DA applications in oil and gas reservoirs exploration, development, and production. The book covers the basic technical details on many tools used in “smart oil fields”. This includes topics such as pattern recognition, neural networks, fuzzy logic, evolutionary computing, expert systems, artificial intelligence machine learning, human-computer interface, natural language processing, data analytics and next-generation visualization. While theoretical details will be kept to the minimum, these topics are introduced from oil and gas applications viewpoints. In this volume, many case histories from the recent applications of intelligent data to a number of different oil and gas problems are highlighted. The applications cover a wide spectrum of practical problems from exploration to drilling and field development to production optimization, artificial lift, and secondary recovery. Also, the authors demonstrate the effectiveness of intelligent data analysis methods in dealing with many oil and gas problems requiring combining machine and human intelligence as well as dealing with linguistic and imprecise data and rules.

Chemical Warfare Agents - Brian J. Lukey 2019-04-11

The first edition of this book, Chemical Warfare Agents: Toxicity at Low Levels, was published just prior to the terrorist attacks of September 11, 2001. The second edition titled, Chemical Warfare Agents: Pharmacology, Toxicology, and Therapeutics, included new epidemiological and clinical studies of exposed or potentially exposed populations; new treatment concepts and products; improved organization of the national response apparatus addressing the potential for CWA terrorism; and improved diagnostic tests that enable rapid diagnosis and treatment. Since the second edition, the chemical warfare agent community has worked hard to advance research for protection and treatment and develop/improve response approaches for individuals and definitive care. Consequently, in addition to updating previous chapters, Chemical Warfare Agents: Biomedical and Psychological Effects, Medical Countermeasures, and Emergency Response, Third Edition features several new chapters that address the Syrian War, chemical destruction, the Organisation for the Prohibition of Chemical Weapons, biomarkers for chemical warfare agent exposure, field sensors, aircraft decontamination, lung/human on a chip, chemical warfare response decision making, and other research advancements. Features: Describes the newest medical interventions, and the latest technologies deployed in the field, as well as developments in the international response to CW usage highlighting recent events in the Middle East Discusses the latest in organizational/interagency partitioning in terms of responsibilities for emergency response, not just in the United States but at the international level—whether prevention, mitigation, medical

care, reclamation, or medico-legal aspects of such response Contains the most current research from bench-level experts The third edition contains the most up-to-date and comprehensive coverage of the question of chemical warfare agent employment on the battlefield or in terrorism. Edited by workers that have been in the field for 35+ years, it remains faithful to the scientific "constants," while evaluating and crediting the advances by the industry that have made us safer.

Fundamentals of Enhanced Oil Recovery Methods for Unconventional Oil Reservoirs - Dheiaa Alfarge 2020-09-18

Fundamentals of Enhanced Oil Recovery Methods for Unconventional Oil Reservoirs, Volume 67 provides important guidance on which EOR methods work in shale and tight oil reservoirs. This book helps readers learn the main fluid and rock properties of shale and tight reservoirs—which are the main target for EOR techniques—and understand the physical and chemical mechanisms for the injected EOR fluids to enhance oil recovery in shale and tight oil reservoirs. The book explains the effects of complex hydraulic fractures and natural fractures on the performance of each EOR technique. The book describes the parameters affecting obtained oil recovery by injecting different EOR methods in both the microscopic and macroscopic levels of ULR. This book also provides proxy models to associate the functionality of the improved oil recovery by injecting different EOR methods with different operating parameters, rock, and fluid properties. The book provides profesasionals working in the petroleum industry the know-how to conduct a successful project for different EOR methods in shale plays, while it also helps academics and students in understanding the basics and principles that make the performance of EOR methods so different in conventional reservoirs and unconventional formations. Provides a general workflow for how to conduct a successful project for different EOR methods in these shale plays Provides general guidelines for how to select the best EOR method according to the reservoir characteristics and wells stimulation criteria Explains the basics and principles that make the performance of EOR methods so different in conventional reservoirs versus unconventional formations

Energy Technology 2017 - Lei Zhang 2017-02-08

This collection focuses on energy efficient technologies including innovative ore beneficiation, smelting technologies, recycling and waste heat recovery. The volume also covers various technological aspects of sustainable energy ecosystems, processes that improve energy efficiency, reduce thermal emissions, and reduce carbon dioxide and other greenhouse emissions. Papers addressing renewable energy resources for metals and materials production, waste heat recovery and other industrial energy efficient technologies, new concepts or devices for energy generation and conversion, energy efficiency improvement in process engineering, sustainability and life cycle assessment of energy systems, as well as the thermodynamics and modeling for sustainable metallurgical processes are included. This volume also offers topics on CO2 sequestration and reduction in greenhouse gas emissions from process engineering, sustainable technologies in extractive metallurgy, as well as the materials processing and manufacturing industries with reduced energy consumption and CO2 emission. Contributions from all areas of non-nuclear and non-traditional energy sources, such as solar, wind, and biomass are also included in this volume.Papers from the following symposia are presented in the book:Energy TechnologiesAdvances in Environmental Technologies: Recycling and Sustainability Joint SessionDeriving Value from Challenging Waste Materials: Recycling and Sustainability Joint SessionSolar Cell Silicon

Nanotechnology for Energy and Environmental Engineering - Lalita Ledwani 2020-03-12

This book examines the potential applications of nanoscience and nanotechnology to promote eco-friendly processes and techniques for energy and environment sustainability. Covering various aspects of both the synthesis and applications of nanoparticles and nanofluids for energy and environmental engineering, its goal is to promote eco-friendly processes and techniques. Accordingly, the book elaborates on the development of reliable, economical, eco-friendly processes through advanced nanoscience and

technological research and innovations. Gathering contributions by researchers actively engaged in various domains of nanoscience and technology, it addresses topics such as nanoparticle synthesis (both top-down and bottom-up approaches); applications of nanomaterials, nanosensors and plasma discharge in pollution control; environmental monitoring; agriculture; energy recovery; production enhancement; energy conservation and storage; surface modification of materials for energy storage; fuel cells; pollution mitigation; and CO2 capture and sequestration. Given its scope, the book will be of interest to academics and researchers whose work involves nanotechnology or nanomaterials, especially as applied to energy and/or environmental sustainability engineering. Graduate students in the same areas will also find it a valuable resource.

Industrial Environmental Management - Tapas K. Das 2020-02-26

Provides aspiring engineers with pertinent information and technological methodologies on how best to manage industry's modern-day environment concerns This book explains why industrial environmental management is important to human environmental interactions and describes what the physical, economic, social, and technological constraints to achieving the goal of a sustainable environment are. It emphasizes recent progress in life-cycle sustainable design, applying green engineering principles and the concept of Zero Effect Zero Defect to minimize wastes and discharges from various manufacturing facilities. Its goal is to educate engineers on how to obtain an optimum balance between environmental protections, while allowing humans to maintain an acceptable quality of life. Industrial Environmental Management: Engineering, Science, and Policy covers topics such as industrial wastes, life cycle sustainable design, lean manufacturing, international environmental regulations, and the assessment and management of health and environmental risks. The book also looks at the economics of manufacturing pollution prevention; how eco-industrial parks and process intensification will help minimize waste; and the application of green manufacturing principles in order to minimize wastes and discharges from manufacturing facilities. Provides end-of-chapter questions along with a solutions manual for adopting professors Covers a wide range of interdisciplinary areas that makes it suitable for different branches of engineering such as wastewater management and treatment; pollutant sampling; health risk assessment; waste minimization; lean manufacturing; and regulatory information Shows how industrial environmental management is connected to areas like sustainable engineering, sustainable manufacturing, social policy, and more Contains theory, applications, and real-world problems along with their solutions Details waste recovery systems Industrial Environmental Management: Engineering, Science, and Policy is an ideal textbook for junior and senior level students in multidisciplinary engineering fields such as chemical, civil, environmental, and petroleum engineering. It will appeal to practicing engineers seeking information about sustainable design principles and methodology.