

Microbial Enhancement of Oil Recovery - Recent Advances

Erle C. Donaldson

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Microbial Enhancement Of Oil Recovery Recent Advances:

Microbial Enhanced Oil Recovery T.F. Yen, 1989-12-21 This volume provides a comprehensive review that consolidates all of the pertinent information available Microbial Enhanced Oil Recovery MEOR involves many scientific disciplines many different approaches and many different countries This book supplies the information needed for continued development of MEOR methods and points out areas where information is lacking and where more research is needed This easy to use resource focuses on the three types of MEOR processes which can be utilized to recover oil from reservoirs Successful MEOR involves contributions from petroleum chemical genetic environmental geotechnical and bioengineering Also geology chemistry and microbiology play a major role as well This critical review book includes a comprehensive reference list and opens the lines of communication among the various fields of study This work will also encourage the exchange of ideas and interaction necessary for success in this quickly developing technology Scientists researchers and practitioners will find this text to be interesting informative and indispensable consolidatesR

Microbial Enhancement of Oil Recovery - Recent Advances E.T. Premuzic, A. Woodhead, 1993-07-23 This volume is concerned with many aspects of petroleum microbiology and biochemistry all with strong commercial applications Worldwide research on the major topic MEOR Microbially Enhanced Oil Recovery is comprehensively covered under experimental work field applications and modeling The challenge of formulating a complete in situ MEOR system microorganisms nutrient package and other amendments is explored together with the future needs in the design and execution of this new biotechnology

Microbial Enhancement of Oil Recovery - Recent Advances E.C. Donaldson, 1991-04-03 This conference was instituted to examine field activities in Microbial Enhancement of Oil Recovery The U S Department of Energy has sponsored several field projects and the details from some of these were presented as well as a few from industry The balance of the program was concerned with new developments in research Today's oil production technology leaves one third to one half of the original oil in place in the reservoir at abandonment of secondary recovery waterflooding This leaves a very large target for microbial enhanced oil recovery which was shown by the research papers of this conference to be capable of producing up to 50% of the residual oil The field trials show that the normal projected oil production decline curve can be reversed or leveled off by microbial enhancement of oil recovery This conference has shown that a variety of applications are possible to correct oilfield problems as well as to enhance oil recovery Among these is the suppression of hydrogen sulfide production which alone is a tremendous advance because of the large quantity of sour oil production If hydrogen sulfide production can be curtailed it would increase the value of the produced oil decrease its toxicity and largely decrease its corrosiveness All of these would be welcome both in the field and at the petroleum refinery where special precautions must be taken to process sour crude oil Another very important discovery is the ability of certain bacteria to eliminate paraffin deposition around the producing well and in the tubulars This is a welcome improvement for many producers who have considerable difficulty in controlling

paraffin deposition **Theory and Practice in Microbial Enhanced Oil Recovery** Kun Sang Lee, Tae-Hyuk Kwon, Taehyung Park, Moon Sik Jeong, 2020-07-18 Selection of the optimal recovery method is significantly influenced by economic issues in today's oil and gas markets. Consequently, the development of cost-effective technologies which bring maximum oil recovery is the main interest in today's petroleum research communities. *Theory and Practice in Microbial Enhanced Oil Recovery* provides the fundamentals, latest research, and creditable field applications. Microbial Enhanced Oil Recovery (MEOR) is potentially a low-priced and eco-friendly technique in which different microorganisms and their metabolic products are implemented to recover the remaining oil in the reservoir. Despite drastic advantages of MEOR technology, it is still not fully supported in the industry due to lack of knowledge on microbial activities and the complexity of the process. While some selected strategies have demonstrated the feasibility to be used on a mass scale through both lab and field trials, more research remains to implement MEOR into more oil industry practices. This reference delivers comprehensive descriptions on the fundamentals, including basic theories on geomicrobiology, experiments, and modeling, as well as current tested field applications. *Theory and Practice in Microbial Enhanced Oil Recovery* gives engineers and researchers the tool needed to stay up to date on this evolving and more sustainable technology. Covers fundamental screening criteria and theories, selective plugging, and mobility control mechanisms. Describes the basic effects on environmental parameters and the mechanics of simulation, including microbial growth kinetics. Applies up to date practical applications proven in both the lab and the field.

Microbial Enhancement of Oil Recovery Erle C. Donaldson, 1991 *Chemical Enhanced Oil Recovery* Patrizio Raffa, Pablo Druetta, 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

Biosurfactants for a Sustainable Future Hemen Sarma, Majeti Narasimha Vara Prasad, 2021-04-19 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

Applied Microbiology and Molecular Biology in Oilfield Systems Corinne Whitby, Torben Lund Skovhus, 2010-10-13 Applied Microbiology and Molecular Biology in Oil Field Systems addresses the major problems microbes cause in oil fields e g biocorrosion and souring and how beneficial microbial activities may be exploited e g MEOR and biofuels The book describes theoretical and practical approaches to specific Molecular Microbiological Methods MMM and is written by leading authorities in the field from both academia and industry The book describes how MMM can be applied to facilitate better management of oil reservoirs and downstream processes The book is innovative in that it utilises real industrial case studies which gives useful technical and scientific information to researchers engineers and microbiologists working with oil gas and petroleum systems

Enhanced Oil Recovery, 1990 **Microbial Enhancement of Oil Recovery** Erle C. Donaldson, 1991 This conference was instituted to examine field activities in Microbial Enhancement of Oil Recovery The U S Department of Energy has sponsored several field projects and the details from some of these were presented as well as a few from industry The balance of the program was concerned with new developments in research Today s oil production technology leaves one third to one half of the original oil in place in the reservoir at abandonment of secondary recovery waterflooding This leaves a very large target for microbial enhanced oil

recovery which was shown by the research papers of this conference to be capable of producing up to 50% of the residual oil. The field trials show that the normal projected oil production decline curve can be reversed or leveled off by microbial enhancement of oil recovery. This conference has shown that a variety of applications are possible to correct oilfield problems as well as to enhance oil recovery. Among these is the suppression of hydrogen sulfide production which alone is a tremendous advance because of the large quantity of sour oil production. If hydrogen sulfide production can be curtailed it would increase the value of the produced oil, decrease its toxicity and largely decrease its corrosiveness. All of these would be welcome both in the field and at the petroleum refinery where special precautions must be taken to process sour crude oil. Another very important discovery is the ability of certain bacteria to eliminate paraffin deposition around the producing well and in the tubulars. This is a welcome improvement for many producers who have considerable difficulty in controlling paraffin deposition.

Microbial Enhancement of Oil Recovery Eugene T. Premuzic, Avril D. Woodhead, 1993

Petroleum Engineer's Guide to Oil Field Chemicals and Fluids Johannes Fink, 2015-08-31. The oil and gas engineer on the job requires knowing all the available oil field chemicals and fluid applications that are applicable to the operation. Updated with the newest technology and available products, *Petroleum Engineer's Guide to Oil Field Chemicals and Fluids* Second Edition delivers all the necessary lists of chemicals by use of their basic components, benefits and environmental implications. In order to maintain reservoir protection and peak well production performance, operators demand to know all the options that are available. Instead of searching through various sources, *Petroleum Engineer's Guide to Oil Field Chemicals and Fluids* Second Edition presents a one-stop, non-commercialized approach by organizing the products by function, matching the chemical to the process for practical problem solving and extending the coverage with additional resources and supportive materials. Covering the full spectrum including fluid loss additives, drilling muds, cement additives and oil spill treating agents, this must-have reference answers to every oil and gas operation with more options for lower costs, safer use and enhanced production. Effectively locate and utilize the right chemical application specific to your oil and gas operation with the author's systematic approach by use of Gain coverage on all oil field chemicals and fluids needed throughout the entire oil and gas life cycle including drilling, production and cementing. Understand environmental factors and risks for oil field chemicals along with pluses and minuses of each application to make the best and safest choice for your operation.

Primer on Enhanced Oil Recovery Vladimir Vishnyakov, Baghir Suleimanov, Ahmad Salmanov, Eldar Zeynalov, 2019-11-06. *Primer on Enhanced Oil Recovery* gives the oil and gas market the introductory information it needs to cover the physical and chemical properties of hydrocarbon reservoir fluids and rock, drilling operations, rock-fluid interactions, recovery methods and the economy of enhanced oil recovery projects. Beginning with introductory materials on basic physics and oil-rock interaction, the book then progresses into well-known types of EOR such as gas injection and microbial EOR. Other sections cover hybrid EOR, smart water, low salinity and solar EOR. Worldwide case study examples give engineers the go-to starting

point they need to understand the fundamentals of EOR techniques and data

Microorganisms in Sustainable Agriculture and Biotechnology T. Satyanarayana, Bhavdish Narain Johri, Anil Prakash, 2012-01-02 This review of recent developments in our understanding of the role of microbes in sustainable agriculture and biotechnology covers a research area with enormous untapped potential Chemical fertilizers pesticides herbicides and other agricultural inputs derived from fossil fuels have increased agricultural production yet growing awareness and concern over their adverse effects on soil productivity and environmental quality cannot be ignored The high cost of these products the difficulties of meeting demand for them and their harmful environmental legacy have encouraged scientists to develop alternative strategies to raise productivity with microbes playing a central role in these efforts One application is the use of soil microbes as bioinoculants for supplying nutrients and or stimulating plant growth Some rhizospheric microbes are known to synthesize plant growth promoters siderophores and antibiotics as well as aiding phosphorous uptake The last 40 years have seen rapid strides made in our appreciation of the diversity of environmental microbes and their possible benefits to sustainable agriculture and production The advent of powerful new methodologies in microbial genetics molecular biology and biotechnology has only quickened the pace of developments The vital part played by microbes in sustaining our planet s ecosystems only adds urgency to this enquiry Culture dependent microbes already contribute much to human life yet the latent potential of vast numbers of uncultured and thus untouched microbes is enormous Culture independent metagenomic approaches employed in a variety of natural habitats have alerted us to the sheer diversity of these microbes and resulted in the characterization of novel genes and gene products Several new antibiotics and biocatalysts have been discovered among environmental genomes and some products have already been commercialized Meanwhile dozens of industrial products currently formulated in large quantities from petrochemicals such as ethanol butanol organic acids and amino acids are equally obtainable through microbial fermentation Edited by a trio of recognized authorities on the subject this survey of a fast moving field with so many benefits within reach will be required reading for all those investigating ways to harness the power of microorganisms in making both agriculture and biotechnology more sustainable

Introduction to Petroleum Biotechnology James G. Speight, Nour Shafik El-Gendy, 2017-12-11 Introduction to Petroleum Biotechnology introduces the petroleum engineer to biotechnology bringing together the various biotechnology methods that are applied to recovery refining and remediation in the uses of petroleum and petroleum products A significant amount of petroleum is undiscoverable in reservoirs today using conventional and secondary methods This reference explains how microbial enhanced oil recovery is aiding to produce more economical and environmentally friendly metabolic events that lead to improved oil recovery Meanwhile in the downstream side of the industry petroleum refining operators are facing the highest levels of environmental regulations while struggling to process more of the heavier crude oils since conventional physical and chemical refining techniques may not be applicable to heavier crudes This reference proposes to the engineer and refining manager the concepts of bio refining applications to

not only render heavier crudes as lighter crudes through microbial degradation but also through bionitrogenation biometallization and biodesulfurization making more petroleum derivatives purified and upgraded without the release of more pollutants Equipped for both upstream and downstream to learn the basics this book is a necessary primer for today's petroleum engineer Presents the fundamentals behind petroleum biotechnology for both upstream and downstream oil and gas operations Provides the latest technology in reservoir recovery using microbial enhanced oil recovery methods Helps readers gain insight into the current and future application of using biotechnology as a refining and fuel blending method for heavy oil and tar sands *Petroleum Microbiology* Bernard Ollivier, Michel Magot, 2005 A state of the art presentation of the specific microbes that inhabit oil reservoirs with an emphasis on the ecological significance of anaerobic microorganisms Provides fundamental and applied biological approaches and serves as an invaluable reference source for petroleum engineers remediation professionals and field researchers Challenges and Recent Advances in Sustainable Oil and Gas Recovery and Transportation Sanket Joshi, Prashant Jadhawar, Asheesh Kumar, 2023-03-10 Challenges and Recent Advances in Sustainable Oil and Gas Recovery and Transportation delivers a critical tool for today's petroleum and reservoir engineers to learn the latest research in EOR and solutions toward more SDG supported practices Packed with methods and case studies the reference starts with the latest advances such as EOR with polymers and EOR with CCS Advances in shale recovery and methane production are also covered before layering on sustainability methods on critical topics such as oilfield produced water Supported by a diverse group of contributors this book gives engineers a go to source for the future of oil and gas The oil and gas industry are utilizing enhanced oil recovery EOR methods frequently but the industry is also tasked with making more sustainable decisions in their future operations Provides the latest advances in enhanced oil recovery EOR including EOR with polymers EOR with carbon capture and sequestration CCS and hybrid EOR approaches Teaches options in recovery and transport such as shale recovery and methane production from gas hydrate reservoirs Includes sustainability methods such as biological souring and oil field produced water solutions *Energy Research Abstracts*, 1993 **Current Research Topics In Applied Microbiology And Microbial Biotechnology - Proceedings Of The II International Conference On Environmental, Industrial And Applied Microbiology (Biomicro World 2007)** Antonio Mendez-vilas, 2009-01-22 This book contains a compilation of papers presented at the II International Conference on Environmental Industrial and Applied Microbiology BioMicroWorld2007 held in Seville Spain on 28 November 1 December 2007 where over 550 researchers from about 60 countries attended and presented their cutting edge research The main goals of this book are to 1 identify new approaches and research opportunities in applied microbiology presenting works that link microbiology with research areas usually related to other scientific and engineering disciplines and 2 communicate current research priorities and progress in the field The contents of this book mirror this focus Microbiologists interested in environmental industrial and applied microbiology and in general scientists whose research fields are related to applied

microbiology can find an overview of the current state of the art in the topic In addition to the more general topic some chapters are devoted to specific branches of microbiology research such as bioremediation biosurfactants microbial factories biotechnologically relevant enzymes and proteins microbial physiology metabolism and gene expression and future bioindustries

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

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