Bacterial Degradation Of Crude Oil By Gravimetric Analysis

Bioremediation of Pollutants
Study on Biodegradation of Miri and Masila Crude Oil and Used Car Oil by Microorganisms Isolated from Malaysian Soil and the Effect of Aeration and NKP Addition on Biodegradation Process
Biodegradation and Bioremediation
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Bioremediation of Petroleum and Petroleum Products
The context of natural forest management and FSC certification in Brazil
The metabolic pathways and environmental controls of hydrocarbon biodegradation in marine ecosystems

GWENDOLYN SAUL

Bioremediation of Pollutants BoD – Books on Demand
With petroleum-related spills, explosions, and health issues in theheadlines almost every day, the issue of remediation of petroleumand petroleum products is taking on increasing importance, for thesurvival of our environment, our planet, and our future. Thisbook is the first of its kind to explore this difficult issue froman engineering and scientific point of view and offer solutions andreasonable courses of action.
Study on Biodegradation of Miri and Masila Crude Oil and Used Car Oil by Microorganisms Isolated from Malaysian Soil and the Effect of Aeration and NKP Addition on Biodegradation Process
National Academies Press
This handbook provides a comprehensive overview of microbial interactions with the major forms of hydrocarbons, oils, and lipids in or entering the biosphere. It is the definitive resource on the physiological mechanisms and adaptive strategies characteristic

of the microbial lifestyle that plays out at hydrophobic material: aqueous liquid interfaces.

Biodegradation and Bioremediation National Academies Press This book presents new insights into the development of different aspects of petroleum science and engineering. The book contains 19 chapters divided into two main sections: (i) Exploration and Production and (ii) Environmental Solutions. There are 11 chapters in the first section, and the focus is on the topics related to exploration and production of oil and gas, such as characterization of petroleum source rocks, drilling technology, characterization of reservoir fluids, and enhanced oil recovery. In the second section, the special emphasis is on waste technologies and environmental cleanup in the downstream sector. The book written by numerous prominent scholars clearly shows the necessity of the multidisciplinary approach to sustainable development in the petroleum industry and stresses the most updated topics such as EOR and environmental cleanup of fossil fuel wastes.

BIODEGRADATION OF CRUDE OIL CONTAMINATED SOIL BY MICROBIAL INOCULANTS LAP Lambert Academic Publishing This book contains a collection of different research activities where several technologies have been applied to the optimization of biodegradation processes. The book has three main sections: A) Hydrocarbons biodegradation, B) Biodegradation and anaerobic digestion, and C) Biodegradation and sustainability.

Handbook of Hydrocarbon and Lipid Microbiology Lulu.com Proceedings of the 42nd OHOLO Conference held in Eilat, Israel, May 3-7, 1998

Microbial Degradation of Xenobiotics Springer

Since the early 1970s, experts have recognized that petroleum pollutants were being discharged in marine waters worldwide, from oil spills, vessel operations, and land-based sources. Public attention to oil spills has forced improvements. Still, a considerable amount of oil is discharged yearly into sensitive coastal environments. Oil in the Sea provides the best available estimate of oil pollutant discharge into marine waters, including an evaluation of the methods for assessing petroleum load and a discussion about the concerns these loads represent. Featuring close-up looks at the Exxon Valdez spill and other notable events, the book identifies important research questions and makes recommendations for better analysis ofâ€"and more effective measures againstâ€"pollutant discharge. The book discusses: Inputâ€"where the discharges come from, including the role of two-stroke engines used on recreational craft. Behavior or fateâ€"how oil is affected by processes such as evaporation as it moves through the marine environment. Effectsâ€"what we know about the effects of petroleum hydrocarbons on marine organisms and ecosystems. Providing a needed update on a problem of international importance, this book will be of interest to energy policy makers, industry officials and managers, engineers and researchers, and advocates for the marine environment.

The Microbiology of Terrestrial Crude Oil Degradation Biodegradation

Biodegradation mediated by indigenous microbial communities is the ultimate fate of the majority of oil hydrocarbon that enters the marine environment. The aim of this Research Topic is to highlight recent advances in our knowledge of the pathways and

controls of microbially-catalyzed hydrocarbon degradation in marine ecosystems, with emphasis on the response of microbial communities to the Deepwater Horizon oil spill in the Gulf of Mexico. In this Research Topic, we encouraged original research and reviews on the ecology of hydrocarbon-degrading bacteria, the rates and mechanisms of biodegradation, and the bioremediation of discharged oil under situ as well as near in situ conditions.

Degradation of N-alkane Fractions of Omani Crude Oil by Bacteria National Academies Press

Microorganisms can be both beneficial and harmful to the oil and gas industry and therefore there is an increasing need for the oil industry to characterize, quantify and monitor microbial communities in real time. Oilfield Microbiology offers a fundamental insight into how molecular microbiological methods have enabled researchers in the field to analyze and quantify in situ microbial communities and their activities in response to changing environmental conditions. Such information is fundamental to the oil industry to employ more directed, cost-effective strategies to prevent the major problems associated with deleterious microbial activities (e.g., souring and biocorrosion), as well as to encourage beneficial microbe activity (e.g. oil bioremediation). The aim of the book is to understand how the technological advances in molecular microbiological methods over the last two decades are now being utilized by the oil industry to address the key issues faced by the sector. This book contains a comprehensive collection of chapters written by invited experts in the field from academia and industry and provides a solid foundation of the importance of microbes to the oil and gas industry. It is aimed at microbial ecologists, molecular biologists, operators, engineers, chemists, and academics involved in the sector.

Microbial Degradation of Crude Oil at High Pressure Elsevier

Bioremediation, hydrocarbon degradation, low temperature, sea-ice, bacterial communities. - The threat of a hydrocarbon contamination in the sea-ice covered areas is growing rapidly due to increasing human activities in the polar regions, which require petroleum as energy source, and due to a fast growing interest in exploiting the estimated one fourth of the world?s oil reservoirs of the Arctic Ocean. This dissertation assessed the influence of crude oil contamination on sea-ice microbial communities (SIMCO) in the Arctic and the Southern Ocean. Field and laboratory experiments were conducted with indigenous sea-ice bacterial communities, while testing three fertilizers, Inipol, fish meal, and soluble inorganic nutrients, for the stimulation of hydrocarbon biodegradation. To test whether bioaugmentation can further enhance oil biodegradation processes, oil degrading bacteria were enriched and reinoculated in oil contaminated sea-ice. The response of the bacterial sea-ice communities was assessed by the molecular methods DGGE and. FISH. Hydrocarbon degradation efficiency was determined with oil fingerprints obtained by GC-FID and radio tracer experiments of single hydrocarbon substances.

UV Effects in Aquatic Organisms and Ecosystems BoD – Books on Demand

Our interest in the microbial biodegradation of xenobiotics has increased many folds in recent years to find out sustainable ways for environmental cleanup. Bioremediation and biotransformation

processes harness the naturally occurring ability of microbes to degrade, transform or accumulate a wide range of organic pollutants. Major methodological breakthroughs in recent years through detailed genomic, metagenomic, proteomic, bioinformatic and other high-throughput analyses of environmentally relevant microorganisms have provided us unprecedented insights into key biodegradative pathways and the ability of organisms to adapt to changing environmental conditions. The degradation of a wide spectrum of organic pollutants and wastes discharged into the environment by anthropogenic activities is an emerging need today to promote sustainable development of our society with low environmental impact. Microbial processes play a major role in the removal of recalcitrant compounds taking advantage of the astonishing catabolic versatility of microorganisms to degrade or transform such compounds. New breakthroughs in sequencing, genomics, proteomics, bioinformatics and imaging are generating vital information which opens a new era providing new insights of metabolic and regulatory networks, as well as clues to the evolution of degradation pathways and to the molecular adaptation strategies to changing environmental conditions. Functional genomic and metagenomic approaches are increasing our understanding of the relative importance of different pathways and regulatory networks to carbon flux in particular environments and for particular compounds. New approaches will certainly accelerate the development of bioremediation technologies and biotransformation processes in coming years for natural attenuation of contaminated environments

Oilfield Microbiology Springer Science & Business Media

32 papers.

Degradation of Crude Oil at Low Temperatures by a Newly Isolated Psychrotolerant Bacterial Consortium Springer Science & Business Media

This book offers extensive coverage of the most important aspects of UVR effects on all aquatic (not just freshwater and marine) ecosystems, encompassing UV physics, chemistry, biology and ecology. Comprehensive and up-to-date, UV Effects in Aquatic Organisms and Ecosystems aims to bridge the gap between environmental studies of UVR effects and the broader, traditional fields of ecology, oceanography and limnology. Adopting a synthetic approach, the different sections cover: the physical factors controlling UVR intensity in the atmosphere; the penetration and distribution of solar radiation in natural waters; the main photochemical process affecting natural and anthropogenic substances; and direct and indirect effects on organisms (from viruses, bacteria and algae to invertebrate and vertebrate consumers). Researchers and professionals in environmental chemistry, photochemistry, photobiology and cell and molecular biology will value this book, as will those looking at ozone depletion and global change.

The Use of Dispersants in Marine Oil Spill Response John Wiley & Sons

In this study, five contaminated soil samples with benzene, used car oil and diesel were collected from five car workshops in Kuala Lumpur area, Malaysia. The microbial strains were isolated using selective media (agar containing crude oil, used car oil and benzene). Microorganisms were identified by biochemical test and then used in biodegradation experiment of two types of

crude oils (Miri and Masila) and used car oil. Qualitative determination of the degradation capacity of crude oils and used car oil was driven in 24 well cell culture cluster - flat bottom, adding to each well nutrient broth medium, crude oil or used car oil and the isolated microorganism cultured in the tubes (single and mixtures) and incubated at 27-°C for 30 days. For hydrocarbons rate of biodegradation measurement, sterilized soil was distributed in petri dishes, 3% w/w of two crude oils and used car oil were added, separately and then supplemented with isolated strains (single and mixtures). One Petri dish was used as a control without any microbial addition. Absorbance was determined by spectrophotometer at 360 nm and at 340 nm for crude oils and used car oil, respectively. The effect of aeration, added NPK and added microbial degraders on biodegradation of Masila crude oil and used car oil was studied. Soil was supplemented with 20% Masila crude oil and used car oil, separately. The soil was distributed into containers. Container (1) was aerated twice a week, NPK 1:1:1 was added to container (2), mixture of all isolated strains with degrading capacity was added to container (3). Finally, NPK with continued aeration in addition to the microbial mixture were applied to the last container (4). One container was used as a control without any addition (soil and contaminant only). Colony Forming Unit (CFU) of total heterotrophic microbes and hydrocarbon utilizing microbes, PH and percentage of oils degradation were determined. 22 microbial strains were isolated and identified as, Achrombacter, Aeromonas, Klebsiella pneumonia, Pseudomonas, Corynebacterium, Penicillium, Enterobacteriaceae (Enteric rods), Actinobacillus, Streptomyces, budding yeast cells, Cladosporum and Geotrichum spp. The highest biodegradation result in Miri crude oil after 30 days were 54.33% and 84.61% for strain Z13 (Corynebacterium spp.) and microbial mixture of the strains isolated from Rawang and Serdang area (MS), respectively. While in Masila crude oil was 33.81% for Strain A3 (Klebsiella pneumonia) and 49.47% for microbial mixture of the strains isolated from Serdang (Smix). In used car oil biodegradation experiment, strain Z4 (Corynebacterium) had the highest degradation with 72.9%. While microbial mixture of the strains isolated from Kajang (Zmix) had 72.4 % of degradation. In the experiment of the effect of aeration, added NPK and added microbial degraders on biodegradation, the aerated container showed 56.62% of degradation after 42 days in Masila crude oil, while the container which contained NPK and was aerated and supplemented with isolated strains showed 66% degradation in used car oil. Generally, two bacterial species and one fungal species isolated were found to be effective degraders (Corynebacterium spp, Streptomyces spp. and Cladosporum spp,), respectively. The highest degradability by single strains was on used car oil which might be due to the adaptability of the isolated microbes to use it. The microbial mixtures showed higher effect on the biodegradation than the single strains. Aeration found to be the most important in the effect on the biodegradation results.

Recent Insights in Petroleum Science and Engineering Springer Science & Business Media

As most oil mishaps have been on water most of the progress or prevention and cleanup has been in the area of aquatic spills and relatively little has been done or considered in the area of

terrestrial spills. Yet numerous petroleum transport systems are terrestrial. For example, the proposed Alyeska pipeline will cross 800 miles of ecologically sensitive terrain in Alaska. Terrestrial oil spill clean-up is difficult in any area, but in Alaska, where permafrost soils and slow growing vegetation are prevalent, the potential problems are magnified immensely. Therefore, after the potential water pollution and health hazards have been addressed, one of the most logical approaches for treating a terrestrial oil spill in Alaska is by microbiological means. The report concerns the topic of microbial decomposition of crude oil in soils.

Impact of Oil Contamination and Bioremediation Treatmentson the Composition and Degradation Efficiency of Poalr Bacterial Sea-ice Communities CIFOR

In this thesis, the effect of high pressure on the ability of bacteria to degrade crude oil components was investigated in high pressure reactors. Depending on the analysed model strain and crude oil component, bacterial growth and degradation ability were either enhanced, inhibited or not affected by high pressure. Moreover, high pressure changed the composition of crude oil-degrading bacterial communities living in deep-sea sediments. This thesis proved that pressure is a crucial factor that cannot be neglected if we want to understand biodegradation of crude oil in deep-sea environments.

Mycoremediation John Wiley & Sons

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 faciliate 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.

Microbial Degradation of Hydrocarbon Mixtures in a Marine Sediment Under Different Temperature Regimes John Wiley & Sons

Spills of petroleum hydrocarbons are major concern because of effects on marine life & beaches. In Canada most of offshore exploration takes place in Arctic or in areas where water tem peratures are low. Laboratory study made over 11 month period measuring rate of degradation of 3 hydrocarbon mixtures under simulated conditions of a marine sediment at temperatures of 15, 10 & 5 C. Aim was to predict rates of degradation at tempera tures below 5 C. Mixtures used were a crude oil, a Bunker C oil and a condensate. Low concentrations (1-3%) were mixed with sand & incorpated into sediment in which a flow of sea-water was maintained. Total counts of aerobic bacteria remained high.

Biodegradation Frontiers Media SA

Petroleum, being a major source of energy, not only supports the modern society, but also serves as a source for serious environmental pollutants. Petroleum contaminated soil contains hydrocarbon mixtures, among which PAHs, are considered as a major environmental threat because of their potential for toxicity,

mutagenicity and carcinogenicity.High molecular weight PAHs, such as pyrene and anthracene appear much more difficult to degrade. Microbes breakdown the organic pollutants by utilizing oxygen as an electron acceptor and they gain energy, and often carbon, as electrons are transferred. The purpose of this work was to investigate the degradation of major Poly Aromatic Hydrocarbon of petroleum sludge pyrene (4 aromatic rings) by two native petroleum hydrocarbon degrading bacteria isolated from sludge of Barauni oil refinery. Changes in soil pH, bacterial biomass, their protein and enzyme activities (i.e. catechol 1,2 dioxygenase and catechol 2,3 dioxygenase) were also observed during the degradation of Pyrene. A microbe based technology for degradation of industrial organic wastes is an economical and eco-friendly technology as compared to conventional technologies available.

The Microbial Degradation of Oil Pollutants CRC Press

Microbial degradation of nickel and vanadium porphyrins is an alternative, economically-important and environment-friendly refinery operation of crude oils. This study developed microbial consortia from Guimaras Island that would be able to degrade nickel protophyrin disodium and vanadium oxide octaethy porphyrins (VOOEP) more effectively than idividual isolates. Degradation potentialsof the selected consorta were evaluated under varying culture conditions and were optimized using the Taguchi method. Of the 23 isolates, four bacteria and three fungi degraded high amount of NiPPDs; however, degradation significantly increased using microbial consortia (p=3.3x10−4) with bacterial consortium Gl-2,3 (Bacillus megaterium and enterobacter cloacae) and fungal consortium As-2,P (Aspergillus unguis and penicillium griseofulvum) exhibiting the highest percent degradation. Gl-2,3 optimally degraded 79% NiPPPDs at pH7, 30 degree C and 40 mg/L NiPPDs and 89% VOOEP at pH6, 30 degree C and 20mg/L VOOEP, with temperature and VOOEP concentration as the most influential factors during degradation. As-2, P optimally degraded 72% NiPPDs at pH 5.5, 30 degree C and 20mg/L NiPPDs and 90% VOOEP at pH 4.5, 50 degree C and 20mg/L VOOEP, with pH as the most influential factor during degradation. The effective degradation of metalloporphyrins by these consortia promises potential biotechnological application in the reduction of nickel and vanadium in crude oils.

Microbial Degradation of Organic Compounds Springer Science & Business Media

Bioremediation of Pollutants: From Genetic Engineering to Genome Engineering provides insights into genetic and genome engineering strategies in bioremediation, covering a wide range of microorganisms that are key to the removal of pollutants. The book includes discussions on root engineering, transgenic plants, metagenomics, bioreactors, molecular biology tools, genome editing, synthetic biology, microbial indicators, biosurfactants, biofilms, genetically modified organisms, and engineered fungi and bacteria. Presented by top experts in the field, this resource captures the essence and diversity of bioremediation methodologies in a single source. Students and beginners in environmental science, researchers, soil scientists, genetic and genome engineers, stakeholders and policymakers interested in improving this rapidly growing area of research will find this resource extremely useful. Draws together research from eminent scientists from across the globe in the areas of

phytoremediation and microbial remediation Includes case studies of engineered bacterial remediation Covers the genome editing CRISPR-Cas9 system that has been less explored in plants and microorganisms

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