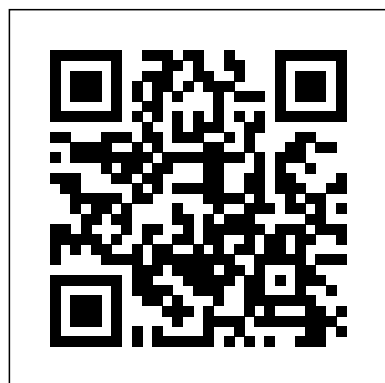


Heavy Oil

Eventually, you will unconditionally discover a new experience and execution by spending more cash. nevertheless when? pull off you give a positive response that you require to acquire those all needs taking into consideration having significantly cash? Why dont you try to get something basic in the beginning? Thats something that will guide you to understand even more around the globe, experience, some places, next history, amusement, and a lot more?

It is your completely own mature to decree reviewing habit. in the middle of guides you could enjoy now is Heavy Oil below.



Written by a scientist and researcher with more than 25 years of experience in the field, this serves as a complete guide to catalyst activity loss during the hydroprocessing of heavy oils. Explores the physical and chemical properties of heavy oils and hydroprocessing catalysts; the mechanisms of catalyst deactivation; catalyst characterization by a variety of techniques and reaction conditions; laboratory and commercial information for model validations; and more Demonstrates how to develop correlations and models for a variety of reaction scales with step-by-step descriptions and detailed experimental data Contains important implications for increasing operational efficiencies within the petroleum industry An essential reference for professionals and researchers working in the refining industry as well as students taking courses on chemical reaction engineering

Unconventional Petroleum Geology is the first book of its kind to collectively identify, catalog, and assess the exploration and recovery potential of the Earth's unconventional hydrocarbons. Advances in hydrocarbon technology and petroleum development systems have recently made the exploration of unconventional hydrocarbons—such as shale gas, tight sandstone oil and gas, heavy oil, tar sand, and coalbed methane—the hottest trend in the petroleum industry. Detailed case studies act as real-world application templates, making the book's concepts immediately practical and useful by exploration geologists. The logical and intuitive three-part approach of systematically identifying an unconventional hydrocarbon, cataloguing its accumulation features, and assessing its exploration and recovery potential can be immediately implemented in the field—anywhere in the world. Provides a detailed assessment of the exploration and recovery potential of the full range of unconventional hydrocarbons More than 300 illustrations—many in full color—capture the detailed intricacies and associated technological advances in unconventional hydrocarbon exploration More than 20 case studies and examples from around the world conclude each chapter and aid in the application of key exploration and recovery techniques

Many oil refineries employ hydroprocessing for removing sulfur and other impurities from petroleum feedstocks. Capable of handling heavier feedstocks than other refining techniques, hydroprocessing enables refineries to produce higher quality products from unconventional — and formerly wasted — sources. Hydroprocessing of Heavy Oils and Residua illustrates how to obtain maximum yields of high-value products from heavy oils and residue using hydroprocessing technologies. While most resources on hydroprocessing concentrate on gas oil and lower boiling products, this book details the chemistry involved and the process modifications required for the hydroprocessing of heavy crude oils and residua. Emphasizing the use of effective catalysts to ensure cleaner and more efficient industrial fuel processes, the book presents key principles of heterogeneous catalyst preparation, catalyst loading, and reactor systems. It explains how to evaluate and account for catalysts, reactor type, process variables, feedstock type, and feedstock composition in the design of hydroprocessing operations. The text concludes with examples of commercial processes and discusses methods of hydrogen production. To meet the growing demand for transportation fuels and fuel oil, modern oil refineries must find ways to produce high quality fuel products from increasingly heavy feedstocks. Hydroprocessing of Heavy Oils and Residua contains the fundamental concepts, technologies, and process modifications refineries need to adapt current hydroprocessing technologies for processing heavier feedstocks.

Fundamentals and Modeling

Development in the Design of Heavy Oil Engines

Heavy Oil--a Major Energy Source for the 21st Century

A Review and Prospects

Enhanced Recovery Methods for Heavy Oil and Tar Sands

Excerpt from Heavy Oil as Fuel for Internal-Combustion Engines This gas oil, as its name implies, can be cracked in hot retorts and an excellent illuminating gas made therefrom (3 or it may be burned with good results as a fuel under steam boilers. About the Publisher Forgotten Books publishes hundreds of thousands of rare and classic books. Find more at www.forgottenbooks.com This book is a reproduction of an important historical work. Forgotten Books uses state-of-the-art technology to digitally reconstruct the work, preserving the original format whilst repairing imperfections present in the aged copy. In rare cases, an imperfection in the original, such as a blemish or missing page, may be replicated in our edition. We do, however, repair the vast majority of imperfections successfully; any imperfections that remain are intentionally left to preserve the state of such historical works.

Increasing demand for rare and disseminated elements such as vanadium has led to interest in extracting those elements from heavy oil, bitumen, and oil shale. This would provide additional benefits such as extra income from byproduct sales. This book begins with a review of the origin and distribution of bitumen and heavy oil and of the rare and disseminated elements found in oil and bitumen. The book then discusses the metallogenic specialization of oil and gas provinces worldwide, the origin of rare/disseminated element concentrations in oil and bitumen, and genetic types of metalliferous oil/bitumen deposits. Subsequent chapters describe distribution patterns of metalliferous heavy oil and bitumen by region, prediction of zones of occurrence, rare elements found in oil shales, total global rare-metal resources in bitumen/heavy oil/oil shale deposits, and the joint development of metalliferous bitumen/oil deposits.

With the combination of an increase in world energy demand and the decline of conventional oils, heavy crude oils have been presented as a relevant hydrocarbons resource for use in the future. Hydrocarbon resources are

very important given that they account for approximately 65% of the world's overall energy resources. Currently, there are three general approaches for transportation of heavy and extra heavy oil: viscosity reduction, drag minimization and in-situ oil upgrading. This book introduces Another promising pipeline technique is the transport of viscous crudes as concentrated oil-in-water (O/W) emulsions.

Metallogeny of Heavy Oils, Natural Bitumens, and Oil Shales

Heavy Oil Production Processes

Estimates of Future Regional Heavy Oil Production at Three Production Rates--background Information for

Assessing Effects in the US Refining Industry

Petroleum Refining: Crude oil, petroleum products, process flowsheets

Processing of Heavy Crude Oils

Heavy oil is a crude oil of typically less than 20API gravity and higher than 200 cp (centipoise) viscosity at reservoir conditions. It is characterised by a viscous, dense, and asphaltic nature. Heavy oil reservoirs are considered as some of the worlds largest reserves. Extraction, recovery, and production of heavy oil are the main challenges in the heavy oil industry. This book provides current research on heavy and crude oils.

"This useful reference offers in-depth coverage of current techniques for converting heavy oils and residues into more valuable distillates.Examines the chemistry of heavy hydrocarbon feeds and their properties important to engineering design, including phase behavior, reaction kinetics, and thermodynamic and transport characteristics!"

Within the last 10 years the world has come to a point where the easily explorable oil deposits have now been found, and it is anticipated that such deposits will be depleted by the beginning of the Twenty-first Century. However, the increasing demand of man kind for energy has caused technologists to look into ways of find ing new sources or to reevaluat:e unconventional sources which, in the past, have not been economical. In this respect, heavy crude and tar sand oils are becoming important in fulfilling the world's energy requirements. What are heavy crude and tar sand oils? There is still some confusion as to their definitions, inasmuch as they vary among organizations and countries. In an effort to set agreed meanings, UNITAR, in a meeting in February 1982 in Venezuela, proposed the following definitions (see also Table 1): 1. Heavy crude oil and tar sand oil are petroleum or petroleum like liquids or semi-solids naturally occurring in porous media. The porous media are sands, sandstone, and carbonate rocks. 2. These oils will be characterized by viscosity and density. Viscosity will be used to define heavy crude oil and tar sand oil, and density (ρ_{API}) will be used when viscosity measurements are not available. 3. Heavy crude oil has a gas-free viscosity of 100-10000 mPa.s (cp) 3 o at reservoir temperatures, or a density of 943 kg/m (20 API) 3 o o to 1000 kg/m (10 API) at 15.6 C and at atmospheric oressure.

Upgrading Oilsands Bitumen and Heavy Oil

Catalysts for Upgrading Heavy Petroleum Feeds

Deactivation of Heavy Oil Hydroprocessing Catalysts

Characteristics, Production and Emerging Technologies

Heavy Oil Tar Emulsions in the Water Gas Process

Coal, Oil Shale, Natural Bitumen, Heavy Oil and Peat is a component of Encyclopedia of Energy Sciences,

Engineering and Technology Resources in the global Encyclopedia of Life Support Systems (EOLSS), which is an integrated compendium of twenty one Encyclopedias. The Theme on Coal, Oil Shale, Natural Bitumen, Heavy Oil and Peat with contributions from distinguished experts in the field discusses matters of great relevance to our world such as: Coal, Oil Shale, Natural Bitumen, Heavy Oil and Peat; Coal Geology and Geochemistry; Coal Technology; Oil Shale; Natural Bitumen (Tar Sands) and Heavy Oil; Peat and Peatland. These two volumes are aimed at the following five major target audiences: University and College students Educators, Professional practitioners, Research personnel and Policy analysts, managers, and decision makers and NGOs.

Hardcover plus CD

Unconventional reservoirs of oil and gas represent a huge additional global source of fossil fuels. However, there is much still to be done to improve techniques for their processing to make recovery and refining of these particular energy sources more cost-effective. Brief but readable, Heavy and Extra-heavy Oil Upgrading Technologies provide readers with a strategy for future production (the up-stream) and upgrading (the down-stream). The book provides the reader with an understandable overview of the chemistry and engineering behind the latest developments and technologies in the industry as well as the various environmental regulations. Clear and rigorous, Heavy and Extra-heavy Oil Upgrading Technologies will prove tool for those scientists and engineers already engaged in fossil fuel science and technology as well as scientists, non-scientists, engineers, and non-engineers who wish to gain a general overview or update of the science and technology of unconventional fossil fuels in general and upgrading technologies in particular. The use of microorganisms and a number of physical methods, such as ultrasound, median microwave, cold plasma, electrokinetic and monocrystalline intermetallics, etc., will be discussed for the first time. Overview of the chemistry, engineering, and technology of oil sands Microorganisms and a number of physical methods such as ultrasound, median microwave, cold plasma, electrokinetic and monocrystalline intermetallics Evolving and new environmental regulations regarding oil sands production processes

Heavy Oil Recovery and Upgrading

Heavy and Extra-heavy Oil Upgrading Technologies

Heavy Oil as Fuel for Internal-Combustion Engines (Classic Reprint)

Heavy Crude Oils

Challenges and Opportunities

Heavy oils, extra-heavy oils and tar sands are major players for the future of energy.They represent a massive world resource, at least the size of conventional oils. They are found all over the world but Canada and Venezuela together account, by themselves, for more than half of world deposits. They share the same origin as the lighter conventional oils, but their geological fate drove them into thick, viscous tar-like crude oils. Most of them result from alteration processes mediated by microbial degradation. They are characterized by a low content of lighter cuts and a high content of impurities such as sulfur and nitrogen compounds and metals ; so, their production is difficult and deployment of specific processes is required in order to enhance their transportability and to upgrade them into valuable products meeting market needs, and honouring environmental requirements.Although these resources are increasingly becoming commercially producible, less than 1% of total heavy crude oil deposits worldwide are under active development. The voluntarily wide scope of this volume encompasses geology, production, transportation, upgrading, economics and environmental

issues of heavy oils. It does not pretend to be exhaustive, but to provide an authoritative view of this very important energy resource.

This report is one of a series of publications assessing the feasibility of increasing domestic heavy oil production and is part of a study being conducted for the US Department of Energy. This report summarizes trends in oil production and refining in Canada. Heavy oil (10° to 20° API gravity) production in California has increased from 20% of the state's total oil production in the early 1940s to 70% in the late 1980s. In each of the three principal petroleum producing districts (Los Angeles Basin, Coastal Basin, and San Joaquin Valley) oil production has peaked then declined at different times throughout the past 30 years. Thermal production of heavy oil has contributed to making California the largest producer of oil by enhanced oil recovery processes in spite of low oil prices for heavy oil and stringent environmental regulation. Opening of Naval Petroleum Reserve No. 1, Elk Hills (CA) field in 1976, brought about a major new source of light oil at a time when light oil production had greatly declined. Although California is a major petroleum-consuming state, in 1989 the state used 13.3 billion gallons of gasoline or 11.5% of US demand but it contributed substantially to the Nation's energy production and refining capability. California is the recipient and refines most of Alaska's 1.7 million barrel per day oil production. With California production, Alaskan oil, and imports brought into California for refining, California has an excess of oil and refined products and is a net exporter to other states. The local surplus of oil inhibits exploitation of California heavy oil resources even though the heavy oil resources exist. Transportation, refining, and competition in the market limit full development of California heavy oil resources.

In this first volume, the reader will find, collected and condensed, the information needed to characterize, analyze, and evaluate crude oils from different origins and their corresponding petroleum cuts as well. The characteristics and specifications of all the petroleum products along with their simplified process flowsheets are reviewed. Contents: 1. Composition of crude oils and petroleum products. 2. Fractionation and elemental analysis of crude oils and petroleum cuts. 3. Characterization of crude oils and petroleum fractions. 4. Methods for the calculation of hydrocarbon physical properties. 5. Characteristics of petroleum products for energy use (motor fuels - heating fuels). 6. Characteristics of non-fuel petroleum products. 7. Standards and specifications of petroleum products. 8. Evaluation of crude oils. 9. Additives for motor fuels and lubricants. 10. Introduction to refining. Appendices: Principal characteristics of pure components. Principal standard test methods for petroleum products. References. Index.

Heavy Oil

Heavy Oil in California

Hydroprocessing of Heavy Oils and Residua

Hybrid Enhanced Oil Recovery Processes for Heavy Oil Reservoirs

Heavy Crude Oil: Resource, Reserve, and Potential Production in the United States

Hybrid Enhanced Oil Recovery Processes for Heavy Oil Reservoirs, Volume 73 systematically introduces these technologies. As the development of heavy oil reservoirs is emphasized, the petroleum industry is faced with the challenges of selecting cost-effective and environmentally friendly recovery processes. This book tackles these challenges with the introduction and investigation of a variety of hybrid EOR processes. In addition, it addresses the application of these hybrid EOR processes in onshore and offshore heavy oil reservoirs, including theoretical, experimental and simulation approaches. This book will be very useful for petroleum engineers, technicians, academics and students who need to study the hybrid EOR processes. In addition, it will provide an excellent reference for field operations by the petroleum industry. Introduces emerging hybrid EOR processes and their technical details Includes case studies to help readers understand the application potential of hybrid EOR processes from different points-of-view Features theoretical, experimental and simulation studies to help readers understand the advantages and challenges of each process

This report is one of a series of publications from a project considering the feasibility of increasing domestic heavy oil (10° to 20° API gravity inclusive) production being conducted for the US Department of Energy. The report includes projections of future heavy oil production at three production levels: 900,000; 500,000; and 300,000 BOPD above the current 1992 heavy oil production level of 750,000 BOPD. These free market scenario projections include time frames and locations. Production projections through a second scenario were developed to examine which heavy oil areas would be developed if significant changes in the US petroleum industry occurred. The production data helps to define the possible constraints (impact) of increased heavy oil production on the US refining industry (the subject of a future report). Constraints include a low oil price and low rate of return. Heavy oil has high production, transportation, and refining cost per barrel as compared to light oil. The resource is known, but the right mix of technology and investment is required to bring about significant expansion of heavy oil production in the US.

The book provides the most up-to-date information on testing and development of hydroprocessing catalysts with the aim to improve performance of the conventional and modified catalysts as well as to develop novel catalytic formulations. Besides diverse chemical composition, special attention is devoted to pore size and pore volume distribution of the catalysts. Properties of the catalysts are discussed in terms of their suitability for upgrading heavy feeds. For this purpose atmospheric residue was chosen as the base for defining other heavy feeds which comprise vacuum gas oil, deasphalted oil and vacuum residues in addition to topped heavy crude and bitumen. Attention is paid to deactivation with the aim to extend catalyst life during the operation. Into consideration is taken the loss of activity due to fouling, metal deposition, coke formed as the result of chemical reaction and poisoning by nitrogen bases. Mathematical models were reviewed focussing on those which can simulate performance of the commercial operations. Configurations of hydroprocessing reactors were compared in terms of their capability to upgrade various heavy feeds providing that a suitable catalyst was selected. Strategies for regeneration, utilization and disposal of spent hydroprocessing catalysts were evaluated. Potential of the non-conventional hydroprocessing involving soluble/dispersed catalysts and biocatalysts in comparison with conventional methods were assessed to identify issues which prevent commercial utilization of the former. A separate chapter is devoted to catalytic dewaxing because the structure of dewaxing catalysts is rather different than that of hydroprocessing catalysts, i.e., the objective of catalytic dewaxing is different than that of the conventional hydroprocessing. The relevant information in the scientific literature is complemented with the Patent literature covering the development of catalysts and novel reactor configurations. Separate chapter was added to distinguish upgrading capabilities of the residues catalytic cracking processes from those employing hydroprocessing. Upper limits on the content of carbon residue and metals in the feeds which can still be upgraded by the former processes differ markedly from those in the feeds which can be upgraded by hydroprocessing. It is necessary that the costs of modifications of catalytic cracking processes to accommodate heavier feeds are compared with that of hydroprocessing methods. Objective of the short chapter on upgrading by carbon rejecting processes was to identify limits of contaminants in heavy feeds beyond which catalytic upgrading via hydroprocessing becomes uneconomical because of the costs of catalyst inventory and that of reactors and equipment. - Comprehensive and most recent information on hydroprocessing catalysts for upgrading heavy petroleum feeds. - Compares conventional, modified and novel catalysts for upgrading a wide range of heavy petroleum feeds. - Comparison of conventional with non-conventional hydroprocessing, the latter involving soluble/dispersed catalysts and biocatalysts. - Development and comparison of mathematical models to simulate performance of catalytic reactors including most problematic feeds. - Residues upgrading by catalytic cracking in comparison to hydroprocessing.

Trends in Heavy Oil Production and Refining in California

Major Tar Sand and Heavy Oil Deposits of the United States

From Geology to Upgrading : an Overview

Heavy-oil and Oil-sand Petroleum Systems in Alberta and Beyond

Subsurface Upgrading of Heavy Crude Oils and Bitumen

Gulf Professional Publishing is an imprint of Elsevier.

Heavy Oil Recovery and Upgrading covers properties, factors, methods and all current and

upcoming processes, giving engineers, new and experienced, the full spectrum of recovery choices, including SAGD, horizontal well technology, and hybrid approaches. Moving on to the upgrading and refining of the product, the book also includes information on in situ upgrading, refining options, and hydrogen production. Rounding out with environmental effects, management methods on refinery waste, and the possible future configurations within the refinery, this book provides engineers with a single source to make decisions and manage the full range of challenges. Presents the properties, mechanisms, screening criteria and field applications for heavy oil enhanced recovery projects Includes current upgrading options and future methods for refining heavy oil development Fills in the gaps between literature and practical application for everyday industry reference

"The emphasis throughout is to link the fundamentals of the molecules through to the economic drivers for the industry, because this combination determines the technology used for processing."-From the Introduction The high demand for quality petroleum products necessitates ongoing innovation in the science and engineering underlying oilsands extraction and upgrading. Beginning with a thorough grounding in the composition, fluid properties, reaction behaviour, and economics of bitumen and heavy oil, Murray Gray then delves into current processing technologies, particularly those used at full commercial scale. The tables of data on composition, yield, and behaviour of oilsands bitumen and heavy oil fractions are extensive. Though the focus is on bitumen from Alberta's oilsands-the largest resource in the world-the science applies to upgrading of heavy oil and petroleum residue feeds worldwide. Upgrading Oilsands Bitumen and Heavy Oil lays out the current best practice for engineers and scientists in the oilsands and refining industries, government personnel, academics, and students.

Unconventional Petroleum Geology

AAPG Studies in Geology 64

Phase Inversion Temperature(PIT);Emulsification; Heavy Crude Oil; Pipeline Transportation; Emulsion

Canadian and U.S. Heavy Crude Oil Markets

Crude oil occurs in many different forms throughout the world. An important characteristic of crude oil that affects the ease with which it can be produced is its density and viscosity. Lighter crude oil typically can be produced more easily and at lower cost than heavier crude oil. Historically, much of the nation's oil supply came from domestic or international light or medium crude oil sources. California's extensive heavy oil production for more than a century is a notable exception. Oil and gas companies are actively looking toward heavier crude oil sources to help meet demands and to take advantage of large heavy oil reserves located in North and South America. Heavy oil includes very viscous oil resources like those found in some fields in California and Venezuela, oil shale, and tar sands (called oil sands in Canada). These are described in more detail in the next chapter. Water is integrally associated with conventional oil production. Produced water is the largest byproduct associated with oil production. The cost of managing large volumes of produced water is an important component of the overall cost of producing oil. Most mature oil fields rely on injected water to maintain formation pressure during production. The processes involved with heavy oil production often require external water supplies for steam generation, washing, and other steps. While some heavy oil processes generate produced water, others generate different types of industrial wastewater. Management and disposition of the wastewater presents challenges and costs for the operators. This report describes water requirements relating to heavy oil production and potential sources for that water. The report also describes how water is used and the resulting water quality impacts associated with heavy oil production.

Heavy crude oils and bitumen represent more than 50% of all hydrocarbons available on the planet. These feedstocks have a low amount of distillable material and high level of contaminants that makes their production, transportation, and refining difficult and costly by conventional technologies. Subsurface upgrading of heavy crude oils and bitumen is of interest to the petroleum industry mainly because of the advantages compared to aboveground counterparts. This book presents an "in depth" account and a critical review of the progress of industry and academia in the area of subsurface upgrading of heavy, extra-heavy oils and bitumen, as reported in the patent and open literature.

Introduction to Enhanced Recovery Methods for Heavy Oil and Tar Sands, Second Edition, explores the importance of enhanced oil recovery (EOR) and how it has grown in recent years thanks to the increased need to locate unconventional resources such as heavy oil and shale. Unfortunately, petroleum engineers and managers aren't always well-versed in the enhancement methods that are available when needed or the most economically viable solution to maximize their reservoir's productivity. This revised new edition presents all the current methods of recovery available, including the pros and cons of each. Expanded and updated as a great preliminary text for the newcomer to the industry or subject matter, this must-have EOR guide teaches all the basics needed, including all thermal and non-thermal methods, along with discussions of viscosity, sampling, and the technologies surrounding offshore applications. Enables users to quickly learn how to choose the most efficient recovery method for their reservoir while evaluating economic conditions Presents the differences between each method of recovery with newly added real-world case studies from around the world Helps readers stay competitive with the growing need of extracting unconventional resources with new content on how these complex reservoirs interact with injected reservoir fluids

Coal, Oil Shale, Natural Bitumen, Heavy Oil and Peat - Volume II

Coal, Oil Shale, Natural Bitumen, Heavy Oil and Peat - Volume I

Water Issues Associated with Heavy Oil Production

Heavy Oil Reservoirs in Arkansas

Introduction to Enhanced Recovery Methods for Heavy Oil and Tar Sands

Recent oil price fluctuations continue to stress the need for more efficient recovery of heavy oil and tar sand bitumen resources. With conventional production steadily declining, advances in enhanced recovery will be required so that oil production can be extended and reservoirs last longer. A practical guide on heavy-oil related recovery methods is essential for all involved in heavy oil production. To feed this demand, James Speight, a well-respected scientist and author, provides a must-read for all scientists, engineers and technologists that are involved in production enhancement. In Enhanced Recovery Methods for Heavy Oil and Tar Sands, Speight provides the current methods of recovery for heavy oil and tar sand bitumen technology, broken down by thermal and non-thermal methods. An engineer, graduate student or professional working with heavy oil, upcoming and current, will greatly benefit from this much-needed text.

As conventional-oil resources are depleted worldwide, vast heavy oil reserves available in various parts of the world become increasingly important as a secure future energy source. Brief but readable, Heavy Oil Production Processes discusses the latest improvements in production processes including; thermal methods (steam floods, cyclic steam stimulation, SAGD) as well as non-thermal methods (cold flow with sand production, cyclic solvent process, VAPEX). The book begins with an overview of the chemistry, engineering, and technology of heavy oil as they evolve into the twenty-first century. The preceding chapters are written to provide a basic understanding of each technology, evolving processes and new processes as

well as the various environmental regulations. Clear and rigorous, Heavy Oil Production Processes will prove useful for those scientists and engineers already engaged in fossil fuel science and technology as well as scientists, non-scientists, engineers, and non-engineers who wish to gain a general overview or update of the science and technology of fossil fuels. The not only does the book discuss the production processes but also provides methods which should reduce environmental footprint and improve profitability. Overview of the chemistry, engineering, and technology of oil sands Updates on the evolving processes and new processes Evolving and new environmental regulations regarding oil sands production Heavy Oil as Fuel for Internal-combustion Engines Heavy Crude Oil Recovery Pipeline Transportation for Heavy Crude Oil Via Oil-in-Water Emulsions Producing Heavy Fuel Oil by Hydrogenating Bituminous Coal Upgrading Petroleum Residues and Heavy Oils