

Asphaltenes, Heavy Oils, and Petroleomics

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Asphaltenes Heavy Oils And Petroleomics

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Asphaltenes Heavy Oils And Petroleomics:

Asphaltenes, Heavy Oils, and Petroleomics Oliver C. Mullins, Eric Y. Sheu, Ahmed Hammami, Alan G. Marshall, 2007-11-08 With substantial contributions from experienced industrial scientists and engineers this work will have real application towards improving process efficiency and improvement in the trillion dollar global petroleum industry It presents an overview of the emerging field of petroleomics which endeavors to understand the fundamental components of crude oil Petroleomics promises to revolutionize petroleum science in much the same way that genomics transformed the study of medicine not long ago Asphaltenes are a particular focus with many chapters devoted to the analysis of their structure and properties *The Chemistry of Oil and Petroleum Products* Merv Fingas, 2022-06-06 This book is devoted to the chemistry of oil and petroleum products and covers the broad range of topics from heavy fuel oils crude oils and diluted bitumen to today's research on asphaltenes Recent methods are summarized and the large new groups of chemicals found in oils are identified as well as described The work points the way for a more complete understanding of the composition of petroleum Highlights include An update on oil fingerprinting New data using Fourier transform mass spectrometry forensic tools for naphthenic acid fraction compounds in oil sand environmental samples Data on vanadium and nickel content changes in the resins of heavy oils characteristics of their structural and group composition and the content of heteroatomic N S O compounds Study of asphaltenes using direct molecular imaging employing atomic force microscopy AFM and scanning tunneling microscopy STM confirming early findings of the dominance of the island molecular structure An update on the Yen Mullins model of asphaltenes in reservoirs giving the requisite solution to the asphaltene particle size thus resolving the gravity term for thermodynamic modeling A modified polymer solution theory the Flory Huggins Zuo FHZ EoS is provided to model asphaltene gradients in reservoirs A suite of oils from the Tarim Basin Qaidam Basin Ordos Basin and Liaohe Basin China is characterized geochemically to clarify factors that can affect the concentrations and distributions of pyrrolic nitrogen compounds PNCs in crude oils An update on biomarkers in crude oils Updates on mass spectrometry techniques applicable to crude oils Subsurface Upgrading of Heavy Crude Oils and Bitumen Cesar Ovalles, 2019-07-24 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 make 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 The author presents an in depth account and a critical review of the progress of industry and academia in underground or In Situ upgrading of heavy extra heavy oils and bitumen as reported in the patent and open literature This work is aimed to be a standalone monograph so three chapters are dedicated to the composition of petroleum and fundamentals of crude oil production and refining Key Features Offers a multidisciplinary scope that will appeal to chemists geologists biologists chemical engineers and petroleum

engineers Presents the advantages and disadvantages of the technologies considered Discusses economic and environmental considerations for all the routes evaluated and offers perspectives from experts in the field working with highlighted technologies *Upgrading Oilsands Bitumen and Heavy Oil* Murray R. Gray,2015-03-11 State of the art oilsands processing technologies from laboratory to full commercial scale *Sustainable In-Situ Heavy Oil and Bitumen Recovery* Mohammadali Ahmadi,2023-03-24 Sustainable In Situ Heavy Oil and Bitumen Recovery Techniques Case Studies and Environmental Considerations delivers a critical reference for today s energy engineers who want to gain an accurate understanding of anticipated GHG emissions in heavy oil recovery Structured to break down every method with introductions case studies technical limitations and summaries this reference gives engineers a look at the latest hybrid approaches needed to tackle heavy oil recoveries while calculating carbon footprints Starting from basic definitions and rounding out with future challenges this book will help energy engineers collectively evolve heavy oil recovery with sustainability applications in mind Explains environmental footprint considerations within each recovery method Includes the latest hybrid methods such as Hybrid of Air CO₂N₂ and Cyclic Steam Stimulation CSS Bridges practical knowledge through case studies summaries and remaining technical challenges Macromolecular Characterization of Hydrocarbons for Sustainable Future Uttam Kumar Bhui,2021-03-10 This book discusses the macromolecular characterization of hydrocarbon components and their industrial applications for sustainable future development It provides efficient integrated solutions and feasible industrial applications for sustainable cleaner and greener future The book covers recent trends in the use of hydrocarbons such as crude oil coal and shale biomass and other carbon materials Various topics covered in this book include challenges in mature field redevelopment enhanced oil recovery optical characteristics of petroleum crudes surfactants brine solutions challenges and issues in processing hydrocarbons coal for future cleaner fuel and chemicals and biomass for fuels and chemicals The book is useful for the researchers and professionals working in the area of petroleum engineering **Processing of Heavy Crude Oils** Ramasamy Marappa Gounder,2019 Unconventional heavy crude oils are replacing the conventional light crude oils slowly but steadily as a major energy source Heavy crude oils are cheaper and present an opportunity to the refiners to process them with higher profit margins However the unfavourable characteristics of heavy crude oils such as high viscosity low API gravity low H C ratio chemical complexity with high asphaltenes content high acidity high sulfur and increased level of metal and heteroatom impurities impede extraction pumping transportation and processing Very poor mobility of the heavy oils due to very high viscosities significantly affects production and transportation Techniques for viscosity reduction drag reduction and in situ upgrading of the crude oil to improve the flow characteristics in pipelines are presented in this book The heavier and complex molecules of asphaltenes with low H C ratios present many technological challenges during the refining of the crude oil such as heavy coking on catalysts Hydrogen addition and carbon removal are the two approaches used to improve the recovery of value added products such as gasoline and diesel In addition the heavy crude oil needs pre

treatment to remove the high levels of impurities before the crude oil can be refined This book introduces the major challenges and some of the methods to overcome them

Rheological Measurement Techniques and Analysis

Methods Jian Wang,2024-12-04 Rheological Measurement Techniques and Analysis Methods provides a comprehensive exploration of modern rheological analysis offering key insights into the flow and deformation behaviors of complex materials across various industries This edited volume brings together advanced techniques and methodologies with a particular focus on real time measurements modeling of viscoelastic materials and practical applications in fields such as plastics and petroleum By bridging theoretical concepts with practical solutions the book serves as an invaluable resource for researchers and professionals seeking to understand and apply rheological principles in material design quality control and process optimization The book covers a wide range of topics from fundamental rheology to cutting edge applications making it a versatile tool for anyone working with fluids or investigating the mechanical properties of complex materials With clear explanations of rheological techniques and their relevance to industries such as manufacturing and energy this volume offers readers practical approaches to solving material challenges and optimizing performance Whether you are a researcher engineer or industry professional this book provides the tools needed to deepen your understanding of rheology and apply it to real world problems

The Science and Technology of Unconventional Oils M. M. Ramirez-Corredores,2017-05-18 This book The Science and Technology of Unconventional Oils Finding Refining Opportunities intends to report the collective physical and chemical knowledge of unconventional oils heavy extra heavy sour acid and shale oil and the issues associated with their refining for the production of transportation fuels It will focus on the discussion of the scientific results and technology activities of the refining of unconventional oils The presence of reactive and refractory compounds and components that negatively impact refining processing the bad actors are discussed and analyzed The commercially available technologies with their reported improvements and emerging ideas concepts and technologies are described This comprehensive overview constitutes the basis for establishing technology gaps and in return sets the science and technology needs to be addressed in the future In summary this book incorporates the relevant knowledge of processing unconventional crude oils and of the Bottom of the Barrel fraction describing the related commercially available and emerging technologies to contribute to the identification of existing gaps Relates physicochemical properties and phenomenological behavior of unconventional oils to refining challenges Describes commercially available technologies and the problems they solve Lists recent improvements in various processes and identifies technology gaps Explains emerging new refining technologies and the problems they solve Discusses future needs and challenges and suggests further research and development needs

Asphaltene Deposition Control by Chemical Inhibitors Ali Ghamartale,Shokufe Afzali,Nima Rezaei,Sohrab

Zendehboudi,2021-08-21 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

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Asphaltenes Heavy Oils And Petroleomics Introduction

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