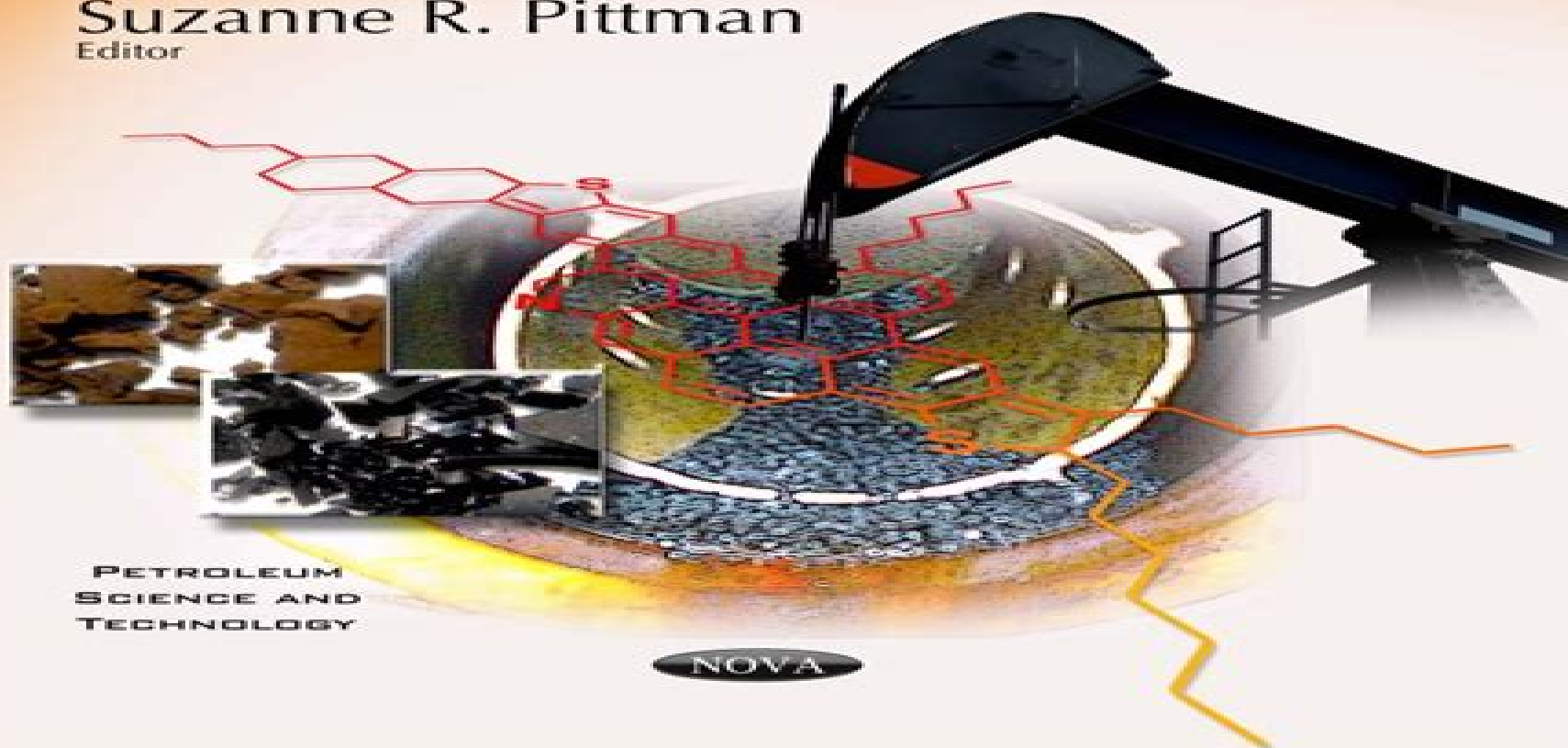


Asphaltenes

Fundamentals, Applications
and Future Developments

Suzanne R. Pittman
Editor



Asphaltenes Fundamentals And Applications

Johan Sjoblom



Asphaltenes Fundamentals And Applications:

Asphaltenes Maite Subirana, Eric Y. Sheu, 2013-06-29 Asphaltenes have traditionally been viewed as being extremely complex thus very hard to characterize In addition certain fundamental properties of asphaltenes have previously been inaccessible to study by traditional macroscopic methods further limiting understanding of asphaltenes These limitations inhibited development of descriptions regarding the microscopic structure and solution dynamics of asphaltenes However a variety of more recent studies have implied that asphaltenes share many chemical properties with the smaller more tractable components of crude oils Recent measurements have indicated that asphaltene molecular weights are not as large as previously thought perhaps in the range of 600 to 1 000 amu In addition new experimental methods applied to asphaltene chemical structures have been quite revealing yielding a broad understanding Consequently the ability to relate chemical structure with physical and chemical properties can be developed and extended to the understanding of important commercial properties of asphaltenes This book treats significant new developments in the fundamentals and applications of asphaltenes In the first section of the book new experimental methods are described that characterize asphaltene structures from the molecular to colloidal length scale The colloidal properties are understandable in terms of asphaltene chemical structures especially with regard to the heteroatom impact on bonding However quantitative measurements of the asphaltene self association still need to be determined In the second section of the book the fundamental understanding of asphaltenes is related directly to asphaltene utilization

Asphaltenes - Fundamentals and Applications SHEU EY., 1995 **Structures and Dynamics of Asphaltenes** Oliver C. Mullins, Eric Y. Sheu, 2013-11-11

The investigative assault upon the enigmatic asphaltenes has recently resulted in significant advances in many varied disciplines Taken individually each discipline exposes certain facets of asphaltenes but each alone can never reveal asphaltenes from all vantages Even seemingly narrowly focused issues such as the molecular structures of asphaltenes or the colloidal structures of asphaltenes require a confluence of many lines of investigation to yield an understanding which differs from truth by diminishing uncertainty An holistic treatment of the asphaltenes is a powerful approach to evolve further their understanding For example examination of asphaltenes at the highest resolution yields molecular structure A slight increase in scale probes asphaltene colloidal structure Weaving together asphaltene studies performed at different length scales results in a fabric which envelops an encompassing vision of asphaltenes At the same time the interfaces of these hierarchical studies provide additional constraints on imagination more than investigations at individual length scales alone These considerations shaped the timing format and the content of our book The editors are very appreciative of the diligence and hard work manifest in each of the contributed chapters herein We thank the contributing authors for making this project a success Oliver C Mullins Eric Y Sheu vii CONTENTS I Asphaltenes Types and Sources Asphaltenes Suzanne R. Pittman, 2016 Asphaltenes are non crystalline brittle and black solids At high temperatures they can polymerize and

convert into coke or asphaltic residue As they do not show a fixed boiling point temperature it is impossible to measure their enthalpy of vaporization by direct means This book provides current research on the fundamentals applications and future developments of asphaltenes Chapter One presents an overview of the main properties of the crude oil crude asphaltenes the problems that these dimly understood solubility class of chemical compounds may create during the production transportation and refining processes and the recent efforts that have been made to achieve a more comprehensive understanding of the molecular architecture and aggregation mechanisms presented by these compounds Chapter Two examines asphaltenes and crude oil fouling Chapter Three reviews thermal degradation of asphaltene by Micro Scale Sealed Vessel MSSV pyrolysis Chapter Four aims to develop magnetite silica nanoparticles with a core shell structure to inhibit the formation damage caused by asphaltenes Chapter Five evaluates surface changes in CAP 30 45 asphalt cement penetration grade 30 45 and paraffin films obtained through spin coating and aged by ultraviolet UV irradiation Chapter Six investigates the factors that affect the breakthrough time process of CO₂ injection using a 2D mathematical model for immiscible injection of carbon dioxide which was developed in the formation of Ilam in one of the oil fields in Iran

Asphaltenes and Asphalts, 2 T.F. Yen,G.V. Chilingarian,2000-08-16 This is the second volume in the series of Asphaltenes and Asphalts Since the publication of the first volume in 1994 there has been a significant advancement in our knowledge Knowledge of both asphaltenes and asphalts is needed by several disciplines and often the progress is dictated by interdisciplinary sciences and technology This includes material sciences fuel sciences chemical engineering civil engineering environmental engineering polymer sciences transportation engineering petroleum engineering chemistry geological sciences physics geochemistry rheology biological sciences tribology soil sciences petroleum science The development in this field is not based on our knowledge of chemistry or petroleum engineering alone as many chemists and petroleum engineers believe In this volume therefore significant contributions from different disciplines have been included

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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 and Technology of Petroleum, Fifth Edition James G.

Speight,2014-02-26 With demand for petroleum products increasing worldwide there is a tendency for existing refineries to seek new approaches to optimize efficiency and throughput In addition changes in product specifications due to environmental regulations greatly influence the development of petroleum refining technologies These factors underlie the need for this fifth edition of The Chemistry and Technology of Petroleum which continues in the tradition of the bestselling fourth edition proving readers with a detailed overview of the chemistry and technology of petroleum as it evolves into the twenty first century The new edition has been updated with the latest developments in the refining industry including new processes as well as updates on evolving processes and various environmental regulations The book covers issues related to economics and future refineries examines the changing character of refinery feedstock and offers new discussions on environmental aspects of refining It contains more than 300 figures and tables including chemical structures and process flow sheets A useful reference for scientists and engineers in the petroleum industry as well as in the catalyst manufacturing industry this book introduces readers to the science and technology of petroleum beginning with its formation in the ground and culminating in the production of a wide variety of products and petrochemical intermediates **Production Chemicals for the Oil and Gas Industry** Malcolm A. Kelland,2016-04-19 Modern production methods and environmental constraints demand chemical solutions And as oilfields age the need for chemicals to ensure steady production increases Production Chemicals for the Oil and Gas Industry describes classes of production chemicals for use topside and downhole in the upstream oil and gas industry It includes coverage of Encyclopedic Handbook of Emulsion Technology Johan Sjoblom,2001-03-16 A discussion of fundamental characteristics theories and applications for liquid liquid colloidal dispersions It profiles experimental and traditional measurement techniques in a variety of emulsified systems including rheology nuclear magnetic resonance dielectric spectroscopy microcalorimetry video enhanced microscopy and conductivity

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