

Petroleum Geochemistry And Geology

Practical Petroleum Geochemistry for Exploration and Production provides readers with a single reference that addresses the principle concepts and applications of petroleum geochemistry used in finding, evaluating, and producing petroleum deposits. Today, there are few reference books available on how petroleum geochemistry is applied in exploration and production written specifically for geologists, geophysicists, and petroleum engineers. This book fills that void and is based on training courses that the author has developed over his 37-year career in hydrocarbon exploration and production. Specific topical features include the origin of petroleum, deposition of source rock, hydrocarbon generation, and oil and gas migrations that lead to petroleum accumulations. Also included are descriptions on how these concepts are applied to source rock evaluation, oil-to-oil, and oil-to-source rock correlations, and ways of interpreting natural gas data in exploration work. Finally, a thorough description on the ways petroleum geochemistry can assist in development and production work, including reservoir continuity, production allocation, and EOR monitoring is presented. Authored by an expert in petroleum geochemistry, this book is the ideal reference for any geoscientist looking for exploration and production content based on extensive field-based research and expertise. Emphasizes the practical application of geochemistry in solving exploration and production problems Features more than 200 illustrations, tables, and diagrams to underscore key concepts Authored by an expert geochemist that has nearly 40 years of experience in field-based research, applications, and instruction Serves as a refresher reference for geochemistry specialists and non-specialists alike

Often the source of confusion to those who have to interpret and apply research results, this glossary gives easy access to the basic nomenclature of petroleum geochemistry. The first part of the book provides a summary in the form of tables and diagrams. The main part gives self-contained explanations for the most common terms. Numerous illustrations and references for further reading are included. Petroleum Geology of Libya, Second Edition, systematically reviews the exploration history, plate tectonics, structural evolution, stratigraphy, geochemistry and petroleum systems of Libya, and includes valuable new chapters on oil and gas fields, production, and reserves. Since the previous edition, published in 2002, there have been numerous developments in Libya, including the lifting of sanctions, a new licensing system, with licensing rounds in 2004, 2005, 2006, and 2007, many new exploratory wells, discoveries and field developments, and a change of regime. A large amount of new data has been published on the geology of Libya in the past fourteen years, but it is widely scattered through the literature. Much of the older data has been superseded, and several of the key publications, especially those published in Libya, are difficult to access. This second edition provides an updated source of reference which incorporates much new information, particularly on petroleum systems, reserves, oil and gas fields, play fairways, and remaining potential. It presents the results of recent research and a detailed description of Libyan offshore geology. The book includes an extensive and comprehensive bibliography. Presents over 180 full colour illustrations including maps, diagrams and charts, illustrating the key concepts in a clear and concise manner Authored by two recognized world authorities on geology in Libya, with over 40 years' experience in Libya between them Provides an expanded and updated version of the bestselling previous edition, nicknamed the Explorationist's Bible Lays the foundation for the post-revolution exploration age in Libya

Over the past two decades there has been increased interest in the availability of hydrocarbon charge through a better understanding of petroleum geochemistry and the identification and characterization of petroleum source rocks. These rocks are geochemically unique and form under specific sets of circumstances. This book brings together both geologic and geochemical data from fifteen petroleum source rocks, ranging in age from Devonian to Eocene, that would otherwise be widely dispersed in the literature or available only in proprietary corporate databases. Much of this information, presented in either a tabular or graphic fashion, provides the petroleum explorationist and the geochemist with a framework to establish relationships among various geochemical indices and depositional settings.

This book has been prepared by the collaborative effort of two somewhat separate technical groups: the researchers at the Institute for Petroleum and Organic Geochemistry, Forschungszentrum Jilich (KFA), and the technical staff of Integrated Exploration Systems (IES). One of us, Donald R. Baker, from Rice University, Houston, has spent so much time at KFA as a guest scientist and researcher that it is most appropriate for him to contribute to the book. During its more than 20-year history the KFA group has made numerous and significant contributions to the understanding of petroleum evolution. The KFA researchers have emphasized both the field and laboratory approaches to such important problems as source rock recognition and evaluation, oil and gas generation, maturation of organic matter, expulsion and migration of hydrocarbons, and crude oil composition and alteration. IES Jilich has been a leader in the development and application of numerical simulation (basin modeling) procedures. The cooperation between the two groups has resulted in a very fruitful synergy effect both in the development of modeling software and in its application. The purpose of the present volume developed out of the 1994 publication by the American Association of Petroleum Geologists of a collection of individually authored papers entitled The Petroleum System - From Source to Trap, edited by L. B. Magoon and W. G. Dow.

Petroleum is not as easy to find as it used to be. In order to locate and develop reserves efficiently, it's vital that geologists and geophysicists understand the geological processes that affect a reservoir rock and the oil that is trapped within it. This book is about how and to what extent, these processes may be understood. The theme of the book is the characterization of fluids in sedimentary basins, understanding their interaction with each other and with rocks, and the application of this information to finding, developing and producing oil and gas. The first part of the book describes the techniques, and the second part relates real-life case histories covering a wide range of applications. Petroleum geology, particularly exploration, involves making the best of incomplete results. It is essentially an optimistic exercise. This book will remove some of the guesswork. Brings together the most important geochemical methods in a single volume. Authored by two well-respected researchers in the oil industry. Real-life, international case histories.

Current and authoritative with many advanced concepts for petroleum geologists, geochemists, geophysicists, or engineers engaged in the search for or production of crude oil and natural gas, or interested in their habitats and the factors that control them, this book is an excellent reference. It is recommended without reservation. AAPG Bulletin.

This Third Edition of Elements of Petroleum Geology is completely updated and revised to reflect the vast changes in the field since publication of the Second Edition. This book is a useful primer for geophysicists, geologists, and petroleum engineers in the oil industry who wish to expand their knowledge beyond their specialized area. It is also an excellent introductory text for a university course in petroleum geoscience. Elements of Petroleum Geology begins with an account of the physical and chemical properties of petroleum, reviewing methods of petroleum exploration and production. These methods include drilling, geophysical exploration techniques, wireline logging, and subsurface geological mapping. After describing the temperatures and pressures of the subsurface environment and the hydrodynamics of connate fluids, Selley examines the generation and migration of petroleum, reservoir rocks and trapping mechanisms, and the habit of petroleum in sedimentary basins. The book contains an account of the composition and formation of tar sands and oil shales, and concludes with a brief review of prospect risk analysis, reserve estimation, and other economic topics. Updates the Second Edition completely Reviews the concepts and methodology of petroleum exploration and production Written by a

preeminent petroleum geologist and sedimentologist with decades of petroleum exploration in remote corners of the world Contains information pertinent to geophysicists, geologists, and petroleum reservoir engineers Updated statistics throughout Additional figures to illustrate key points and new developments New information on drilling activity and production methods including crude oil, directional drilling, thermal techniques, and gas plays Added coverage of 3D seismic interpretation New section on pressure compartments New section on hydrocarbon adsorption and absorption in source rocks Coverage of The Orinoco Heavy Oil Belt of Venezuela Updated chapter on unconventional petroleum

Understanding the origin and fate of hydrocarbons in the subsurface was the major endeavor of organic geochemists during the second half of the twentieth century. They succeeded to the point where the deciphered interplaying of elements and processes paved the way for the revolutionary concept of the petroleum system, a unifying paradigm that plays an important role in decision making associated with oil and gas exploration. The chemistry and physics involved have been addressed in a quantitative way and integrated into the other aspects of petroleum geology, giving rise to the development of numerical basin modeling. This book has been designed to offer an overview of different aspects of the geochemistry of fossil fuels, in particular the functioning of a petroleum system. In this respect, it can be viewed as a foundation for approaching basin modeling. This book will be of interest to a large audience including specialists in the field, nonspecialist professionals, and undergraduate and graduate students.

Giant Coal-Derived Gas Fields and Their Gas Sources in China presents a thorough look at 32 coal-derived gas fields in China. This reference book includes two main parts, the first discussing the geologic characteristics of the tectonic, stratigraphy, source and cap rock assemblage for the accumulation periods. The second part features multiple differential indexes, charts, phase states (gas, liquid, solid), and the methods used to determine the sources of the coal-derived giant gas fields. As the first comprehensive coverage of the methods of gas to source correlation in China, this book will be a classic reference for researchers working in natural gas geology and geochemistry, and teachers working in universities around the world.

Provides geochemical data of the coal-derived giant gas fields, guaranteeing the reliability of the research Integrates various indexes, charts, phase states (gas, liquid, solid), and methods to determine the sources of the coal-derived giant gas fields Provides numerous data and case studies of gas fields from coal source rock, giving readers a unique reference for the petroleum geochemistry and geology market

The application of surface geochemical methods to finding petroleum is based on the detection of hydrocarbons in the soil that have leaked from a petroleum reservoir at depth. While the seal over the deposit was once considered impermeable, surface geochemistry data now show that such leakage is a common occurrence. Despite its simplicity and low costs, surface geochemistry remains controversial because, until now, there was no objective and in-depth treatment of the various methods of surface geochemistry for oil exploration. Written by a successful oil finder, this practical guide: * surveys a broad array of surface geochemistry techniques, from soil gases to microbiology, and provides clear strategies for applying them to the high-stakes art of petroleum exploration * offers numerous case studies, both successes and failures, to show the strengths and weaknesses of different approaches * examines statistical and spatial variation, surveys and models in surface geochemistry, demonstrating how each analytical tool can be used to optimize accuracy * integrates surface geochemistry data interpretation with data from conventional methods of oil exploration, and considers the economics of surface geochemical approaches * discusses key topics that have been neglected in the literature, such as grid design and the effects of soils. Geologists, geophysicists, geological engineers and exploration managers involved in petroleum exploration will gain valuable insights from this volume. By presenting and evaluating each method of surface geochemistry in a neutral tone, this book enables the reader to select and employ these methods with greater confidence.

This text clearly integrates the contributions of geology, geophysics and other branches of geoscience into one complete, definitive volume. Abundant tables and figures, chapter summaries and references contribute to the book's clarity and comprehensiveness.

This book is intended primarily as a textbook for geologists engaged in petroleum exploration. Its purpose is to introduce the reader to organic geochemistry and to show how to apply geochemistry advantageously in an exploration program. I have made the explicit assumption that most readers will have a sound background in geology but far less knowledge of, or interest in, chemistry. Because there is no need for an exploration geologist to be an expert in organic chemistry, the amount of chemistry used in the book is rather modest. It is, however, often important for a geologist to understand some basic vocabulary. The emphasis in this book is on applications of geochemistry to hydrocarbon exploration. Most of the analytical techniques are discussed only briefly, because although a geologist should know what a gas chromatograph is, he or she is unlikely to be asked to repair one. If more detailed knowledge does prove necessary, a laboratory is the proper place to learn. The strengths and weaknesses of the various analytical techniques are discussed so that a geologist will be able to anticipate pitfalls, cull bad data, and choose an appropriate analytical program. On-the-job experience will prove invaluable in converting the basic information from this text into a practical working knowledge. Petroleum geochemistry has turned out to be more than another step in the direction to quantify geology and geosciences in general. Petroleum geochemistry as it is today may very well be the triggering event that brings the other branches of geosciences like sedimentology, stratigraphy, structural geology, geophysics and others to a fruitful synthesis as evidenced by integrated basin studies.

This book discusses the progress that is being made through innovations in instrumental measurements of geologic and geochemical systems and their study using modern mathematical modeling. It covers the systems approach to understanding sedimentary rocks and their role in evolution and containment of subsurface fluids. Fundamental aspects of petroleum geology and geochemistry, generation, migration, accumulation, evaluation and production of hydrocarbons are discussed with worldwide examples. Various physical and chemical properties of subsurface waters, crude oils and natural gases are described which is especially important to production engineering. Among various properties of liquid and gaseous hydrocarbons the most important are wettability affecting production characteristics and ultimate recovery; relative permeability affecting reservoir fluid flow to the production wells; density differences between immiscible fluids which affects gravity drainage; viscosity of subsurface fluids affecting the relative mobility of each fluid; and fluid chemistry, which affects the absorption, ultimate recovery and monetary value of produced hydrocarbons. Discussion of the formation and accumulation of hydrocarbons includes (1) the changes in the chemical composition of hydrocarbons that originate from the debris of living plants and organisms to form crude oil and natural gas; (2) the origin of hydrocarbons in different areas of a single reservoir; (3) the conditions, which determine the distribution of

water, oil and gas in the reservoir; (4) the migration of subsurface fluids until they eventually accumulate in isolated traps; (5) discussion of the traps as a function of sedimentary geology and tectonics. This is based on the systems approach to the specific geologic and geochemical systems using analytical and statistical principles and examples of modern mathematical modeling of static and dynamic systems. * Discusses fundamental aspects of petroleum geology and geochemistry, and generation, migration, accumulation, evaluation and production of hydrocarbons * Presents a systems approach to the specific geologic and geochemical systems

Petroleum geoscience comprises those geoscientific disciplines which are of greatest significance for the exploration and recovery of oil and gas. These include petroleum geology, of which sedimentary geology is the main foundation along with the contextual and modifying principles of regional, tectonic and structural geology. Additionally, biostratigraphy and micropalaeontology, organic geochemistry, and geophysical exploration and production techniques are all important tools for petroleum geoscientists in the 21st century. This comprehensive textbook presents an overview of petroleum geoscience for geologists destined for the petroleum industry. It should also be useful for students interested in environmental geology, engineering geology and other aspects of sedimentary geology

This volume presents the most significant papers given during the 13th International Meeting in Organic Geochemistry. The intention of the publication is to provide the scholars of this science with its state-of-the-art and recent papers not only in academic research but above all in practical applications. Several papers attest to an increased use of organic geochemistry not only in the oil industry, during all phases of petroleum exploration, but also in the other research areas of coal origin and structure, metallogeny, sedimentology, molecular palaeontology, biochemistry and pollution.

This book provides a comprehensive overview of the geology and the petroleum potential of the Arctic. Nine papers offer a circum-Arctic perspective on the Phanerozoic tectonic and palaeogeographic evolution, the currently recognized sedimentary basins, the gravity and magnetic fields and, perhaps most importantly, the petroleum resources and yet-to-find potential of the basins. The remaining 41 papers provide data-rich, geological and geophysical analyses and individual oil and gas assessments of specific basins throughout the Arctic. These detailed and well illustrated studies cover the continental areas of Laurentia, Baltica and Siberia and the Arctic Ocean. Of special interest are the 13 papers providing new data and interpretations on the extensive, little known, but promising, basins of Russia.

Petroleum Geochemistry and Exploration in the Afro-Asian Region includes 29 papers presented at the 6th International Conference on Petroleum Geochemistry and Exploration in the Afro-Asian Region. Petroleum geochemistry has played a crucial role in determining effective source rocks, classifying petroleum systems and delineating the geneses of conventional and unconventional oils and gases. By reference to petroleum geochemistry, the dynamic process of petroleum accumulations can be traced, which helps determining the prospecting target areas and reducing the exploration risk. Petroleum exploration is also enhanced by basin modeling and petroleum system classification, through the application of geochemical data. There has been significant progress in petroleum exploration due to the application of molecular geochemistry and biomarkers. Advances in this area include the identification and application of age-indicating biomarkers, the application of diamondoids in appraising the cracking level of crude oils, and the application of the compound-specific isotope analysis of biomarkers and the compound-specific isotope analysis of diamondoids (CSIAB and CSIAD) in oil-source correlation and quantitative identification of source-commingled oils. In reconstructing the history of oil and gas accumulations, three other techniques are of note: the dynamics of hydrocarbon generation, the dynamics of carbon isotopic fractionation and the analysis of liquid historical recordings (inclusions). Petroleum Geochemistry and Exploration in the Afro-Asian Region is an invaluable source of information for oil and gas explorers, petroleum geochemists and students of petroleum geochemistry. Researchers in petroleum companies and institutes will also find this publication useful.

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

This comprehensive textbook presents an overview of petroleum geoscience for geologists active in the petroleum industry, while also offering a useful guide for students interested in environmental geology, engineering geology and other aspects of sedimentary geology. In this second edition, new chapters have been added and others expanded, covering geophysical methods in general and electromagnetic exploration methods in particular, as well as reservoir modeling and production, unconventional resources and practical petroleum exploration.

This is a how-to encyclopedia of prospecting for oil and gas. The book, an addition to the Handbook set of the Treatise of Petroleum Geology, focuses on procedures and proven petroleum exploration techniques that are critical for generating viable prospects. The twenty-one chapters deal with exploration philosophy, the concept and critical elements of traps in a petroleum system, evaluating the elements of a petroleum province, and methods for predicting reservoir occurrence, quality, and performance.

A collection of poems personifying fifteen different colors.

This volume contains a compilation of 17 seminal papers, taken from various Geological Society Special Publications and the Journal of the Geological Society, on the use and application of stratigraphy in petroleum geology over the last 20 years. The volume focuses on case studies in fundamental stratigraphy, applied and integrated stratigraphy and alternative methods of stratigraphy. The book is introduced with an original scientific and historical review of the subject: all papers are set in context with both the benefits of the techniques and some of the short-comings highlighted. By compiling these papers, commercial stratigraphers John Gregory, Philip Copestake and Julian Pearce have created a volume intended for a wide readership. However, it is of particular relevance for the training of undergraduate students studying courses on petroleum geology, basin development and sequence stratigraphy as well as for all postgraduate students working in petroleum-related scientific fields. It is also intended as a volume of general use for geoscientists entering the petroleum industry, as well as current workers requiring an overview.

The wealth of petroleum has made the Middle East one of the most actively explored regions of the world. The volume of geological, geophysical and geochemical data collected by the petroleum industry in recent decades is enormous. The Middle East may be a unique region in the world where the volume of subsurface data and information exceeds that based on surface outcrop. This book reviews the tectonic and geological history of the Middle East and the regional hydrocarbon potential on a country by country basis in the context of current ideas developed through seismic and sequence stratigraphy and incorporating the ideas of global sea level change. Subsurface data have been used as much as possible to amplify the descriptions. The paleogeographic approach provides a means to view the area as a whole. While the country by country approach inevitably leads to some repetition, it enhances the value of the volume as a teaching tool and underlines some of the changing lithologies within formations carrying the same name.

This book reviews the present status of organic geochemistry and its application to Petroleum Exploration. It is intended to be as practical as possible with all aspects of geochemistry illustrated by a great number of examples taken from case histories from all over the world which show that geochemistry must be used in the framework of a good geological/geophysical background. This book is written for: petroleum geologists and geophysicists; managers who should integrate the impact of geochemistry in exploration decision-making; specialized geochemists who need an accurate panorama of other aspects of geochemistry; university professors and students in petroleum geology.

This edited volume is based on the best papers accepted for presentation during the 1st Springer Conference of the Arabian Journal of Geosciences (CAJG-1), Tunisia 2018. The book is of interest to all researchers in the fields of petroleum engineering, reservoir engineering and petroleum geochemistry. The MENA region accounts for more than 50 percent of the world's hydrocarbon reserves. Despite being the largest oil and gas producer of the world, the MENA countries face routine problems regarding petroleum engineering, reservoir modelling and production optimization. This volume offers an overview of the latest information and ideas regarding reservoir engineering, petrophysical engineering, petroleum system modelling, non-conventional energy resources and environmental impact of oil production. Main topics include: 1. Advances in petrophysical characterization of reservoir rocks 2. Enhanced oil recovery methods 3. Advances in petroleum exploration and management 4. Evaluation of hydrocarbon source potential and petroleum system modeling 5. Non-conventional energy resources

[Copyright: e47fd3864b42f10079e19c18820d59ee](https://www.pdfdrive.com/petroleum-geochemistry-and-geology-e47fd3864b42f10079e19c18820d59ee.html)