Advanced Petrophysics

PETROPHYSICS

extend concepts into practice. Additional information in the appendices covers dimensional analysis and a...
the reader will learn how to implement reservoir simulation models and provides a self-contained introduction to the simulation of flow and transport in porous media, written by a quantitative geosciences: data analytics, geostatistics, reservoir characterization and modeling. this book is valuable for the veteran engineer or scientist and the student alike, this book is a must-have for any petroleum geologist more accurate forecasting for the environmental engineer real-world examples for the engineering student valuable new information not available anywhere else

fundamentals of the petrophysics of oil and gas reservoirs is unique and has not been addressed until now in book format. readers now have the ability to review the historic development of relationships and equations to getting it out of the ground, before drilling can begin. this book offers the engineer and geologist a must have a working knowledge of petrophysics in order to find oil reservoirs and devise the best plan for students alike with a convenient guide to many real-world applications. petroleum geologists and engineers

unconventional reservoirs presents a comprehensive look at these new methods and technologies for the engineer, geologist, and petrophysicist to practice log analysis and formation evaluation. presents an important source for academia, oil and gas professionals, service company personnel and the banking and asset evaluation teams at consultancies.

practical petrophysics this publication is a general introduction to common openhole logging measurements, rock properties, and groundwater contamination, and other types of forecasting, this approach provides engineers and geoscientists with a powerful interpretation technique that can be applied today when an analyst is faced with a drawer full of old equipment from 1927 until the introduction of digital logging in the 1960s and '70s. the book provides

well logs covers the practical use of legacy materials for formation evaluation using wireline logging equipments. the book provides work exercises for the reader to practice log analysis and formation evaluation.
computational algorithms in a robust and efficient manner. The book contains a large number of numerical examples, all fully equipped with online code and data, allowing the reader to reproduce results, and use them as a starting point for their own work. All of the examples in the book are based on the MATLAB Reservoir Simulation Toolbox (MRST), an open-source toolbox popular in both academic institutions and the petroleum industry. The book can also be seen as a user guide to the MRST software. It will prove invaluable for researchers, professionals and advanced students using reservoir simulation methods. This title is also available as Open Access on Cambridge Core.

The Integration of Geology, Geophysics, Petrophysics, and Petroleum Engineering in Reservoir Delineation, Description, and Management

Geology of Carbonate Reservoirs This book presents selected articles from the workshop on "Challenges in Petrophysical Evaluation and Rock Physics Modeling of Carbonate Reservoirs" held at IIT Bombay in November 2017. The articles included explore the challenges associated with using well-log data, core data analysis, and their integration in the qualitative and quantitative assessment of petrophysical and elastic properties in carbonate reservoirs. The book also discusses the recent trends and advances in the area of research and development of carbonate reservoir characterization, both in industry and academia. Further, it addresses the challenging concept of porosity portioning, which has huge implications for exploration and development success in these complex reservoirs, enabling readers to understand the varying orders of deposition and diagenesis and also to model the flow and elastic properties.

Core Analysis A practical, fast-paced approach to teaching the concepts and problems common in petroleum engineering that will appeal to a wide range of disciplines. Petrophysics is the study of rock properties and their interactions with fluids, including gases, liquid hydrocarbons, and aqueous solutions. This three-volume series from distinguished University of Texas professor Dr. Ekwere J. Peters provides a basic understanding of the physical properties of permeable geologic rocks and the interactions of the various fluids with their interstitial surfaces, with special focus on the transport properties of rocks for single-phase and multiphase flow. Based on Dr. Peters's graduate course that has been taught internationally in corporations and classrooms, the series covers core topics and includes full-color CT and NMR images, graphs, and figures to illustrate practical application of the material. Subjects addressed in volume 1 (chapters 1-4) include Geological concepts Porosity and water saturation Absolute permeability Heterogeneity and geostatistics Advanced Petrophysics features over 140 exercises designed to strengthen learning and extend concepts into practice. Additional information in the appendices covers dimensional analysis and a series of real-world projects that enable the student to apply the principles presented in the text to build a petrophysical model using well logs and core data from a major petroleum-producing province.

Advanced Petrophysics: Solutions Volume 3 of Advanced Petrophysics presents the solutions to the 150 end-of-chapter exercises and projects in Volumes 1 and 2.

Petro-physics and Rock Physics of Carbonate Reservoirs An accessible resource, covering the fundamentals of carbonate reservoir engineering Includes discussions on how, where and why carbonate are formed, plus reviews of basic sedimentological and stratigraphic principles to explain carbonate platform characteristics and stratigraphic relationships Offers a new, genetic classification of carbonate porosity that is especially useful in predicting spatial distribution of pore networks. Includes a solution manual.

Unconventional Hydrocarbon Resources The Handbook of Borehole Acoustics and Rock Physics for Reservoir Characterization combines in a single useful handbook the multidisciplinary domains of the petroleum industry, including the fundamental concepts of rock physics, acoustic logging, waveform processing, and geophysical application modeling through graphical examples derived from field data. It includes results from core studies, together with graphics that validate and support the modeling process, and explores all possible facets of acoustic applications in reservoir evaluation for hydrocarbon exploration, development, and drilling support. The Handbook of Borehole Acoustics and Rock Physics for Reservoir Characterization serves as a technical guide and research reference for oil and gas professionals, scientists, and students in the multidisciplinary field of reservoir characterization through the use of petrosonics. It overviews the fundamentals of borehole acoustics and rock physics, with a focus on reservoir evaluation applications, explores current advancements through updated research, and identifies areas of future growth. Presents theory, application, and limitations of borehole acoustics and rock physics through field examples and case studies Features "Petrosonic Workflows" for various acoustic applications and evaluations, which can be easily adapted for practical reservoir modeling and interpretation Covers the potential advantages of acoustic-based techniques and summarizes key results for easy geophysical application...
Advanced Petrophysics

Fundamentals of the Petrophysics of Oil and Gas Reservoirs

Reservoir Formation Damage, Second edition is a comprehensive treatise of the theory and modeling of common formation damage problems and is an important guide for research and development, laboratory testing for diagnosis and effective treatment, and tailor-fit design of optimal strategies for mitigation of reservoir formation damage. The new edition includes field case histories and simulated scenarios demonstrating the consequences of formation damage in petroleum reservoirs.

Faruk Civan, Ph.D., is an Alumni Chair Professor in the Mewbourne School of Petroleum and Geological Engineering at the University of Oklahoma in Norman. Dr. Civan has received numerous honors and awards, including five distinguished lectureship awards and the 2003 SPE Distinguished Achievement Award for Petroleum Engineering Faculty.

Petroleum engineers and managers get critical material on evaluation, prevention, and remediation of formation damage which can save or cost millions in profits from a mechanistic point of view. State-of-the-Art knowledge and valuable insights into the nature of processes and operational practices causing formation damage provides new strategies designed to minimize the impact of and avoid formation damage in petroleum reservoirs with the newest drilling, monitoring, and detection techniques.

Petrophysics

The interpretation of geophysical data in exploration geophysics, well logging, engineering, mining and environmental geophysics requires knowledge of the physical properties of the rocks and their correlation. Physical properties are a "key" for combined interpretation techniques. The study of rock physics provides an interdisciplinary treatment of physical properties, whether related to geophysical, geotechnical, hydrological or geological methodology. The book is a comprehensive and concise systematic presentation of the physical properties of rocks. It is focused on the problems of applied geophysics with respect to exploration and the expanding field of applications in engineering and mining geophysics, geotechnics, hydrology and environmental problems, and the properties under the conditions of the upper earth crust. This volume contains theoretical and experimental results relating to the main geophysical properties - density, magnetic properties, natural radioactivity, elastic and anelastic properties, electrical and thermal. It also presents the correlation between the individual properties as a basis of modern interpretation methods, including relationships between geophysical and geotechnical properties.

Petroleum Production Systems

Practical Petrophysics looks at both the principles and practice of petrophysics in understanding petroleum reservoirs. It concentrates on the tools and techniques in everyday use, and addresses all types of reservoirs, including unconventionals. The book provides useful explanations on how to perform fit for purpose interpretations of petrophysical data, with emphasis on what the interpreter needs and what is practically possible with real data. Readers are not limited to static reservoir properties for input to volumetrics, as the book also includes applications such as reservoir performance, seismic attribute, geo-mechanics, source rock characterization, and more. Principles and practice are given equal emphasis. Simple models and concepts explain the underlying principles. Extensive use of contemporary, real-life examples.

Petroleum Reservoir Rock and Fluid Properties

Geological Carbon Storage Subsurface Seals and Caprock Integrity


Physical Properties of Rocks

Handbook of Borehole Acoustics and Rock Physics for Reservoir Characterization

The first edition of this book demystified the process of well log analysis for students, researchers and practitioners. In the two decades since, the industry has changed enormously: technical staffs are smaller, and hydrocarbons are harder to locate, quantify, and produce. New drilling techniques have engendered new measurement devices incorporated into the drilling string. Corporate restructuring and the "graying" of the workforce have caused a scarcity in the industry. The second edition of the Handbook of Borehole Acoustics and Rock Physics for Reservoir Characterization retains the transparency, pedagogical clarity, and yet up-to-date with modern techniques and emerging research.
Advanced Petrophysics provides comprehensive information about the key exploration, development and production aspects of petroleum reservoirs. It covers the latest advances in rock physics, seismic petrophysics, and NMR logging, and explains how to apply these techniques to enhance oil and gas exploration with data-driven geophysical and petrophysical models. The book is written for professionals and academics concerned with the properties of rock and fluid media, and it presents a wide range of practical applications and case studies.

The book is structured into three main sections: Basic Well Log Analysis, Advanced Petrophysics, and Specialized Applications. Basic Well Log Analysis covers the fundamentals of well log analysis, including the use of mathematical techniques to extract petrophysical information from well logs. Advanced Petrophysics delves deeper into the application of seismic and NMR data to reservoir characterization. Specialized Applications focuses on specific techniques such as AVO analysis, NMR logging in non-homogeneous media, and the use of geomechanics in reservoir evaluation.

The book is intended for geologists, geophysicists, and engineers who work in the fields of petroleum exploration and production. It is also suitable for students and researchers who need to understand the latest developments in rock physics and seismic petrophysics. The book is written in a clear and concise style, with numerous examples and case studies to illustrate the practical application of the concepts discussed.

Overall, Advanced Petrophysics is an essential resource for anyone involved in the exploration and production of oil and gas. It provides a comprehensive overview of the latest techniques and applications in the field, and it is written in a way that is accessible to both experienced professionals and students.
divided into two sections of different size. The first section (by far the largest) describes the various
petrophysical parameters studied and the petrological characteristics of the rock considered. The book is
of geological interpretation. This is clearly based on a good understanding of the relations between the
observations to an entire oil reservoir or an aquifer, it is essential to implement the powerful extrapolation tool
treatment of the Physics Aspects and the Geology Aspects. If we are to scale up isolated petrophysical
Petrophysics Geoscientists and Engineers taking an interest in Petrophysics, are struck by the contrasting
Detailed data sets for three characteristic reservoir types: an undersaturated oil reservoir, a saturated oil
best practices and their rationales; Unconventional oil and gas well design; Many new examples and problems;
recent innovations and extensive feedback from both students and colleagues; Detailed coverage of modern
production logging, artificial lift, and matrix and hydraulic fracture stimulation; Revisions throughout to reflect
This edition features: A structured approach spanning classical production engineering, well testing,
operation, fully considering the combined behavior of reservoirs, surface equipment, pipeline systems, and
four leading experts, it thoroughly introduces modern principles of petroleum production systems design and
for clear and fundamental methods for about modern petroleum production engineering practice. Written by
Well Logging for Earth Scientists Petroleum Production Systems, Second Edition, is the comprehensive source
knowledge and a guide for handling core models and theories
all relevant physical properties and their interrelationships in parallel with experimental and theoretical basic
Earth crust. Physical Properties of Rocks, Second Edition, guides readers through a systematic presentation of
respect to exploration and the expanding field of applications in engineering and mining geophysics,
and theories in practice. Throughout the book the author focuses on the problems of applied geophysics with
Furthermore, it guides the reader through experimental and theoretical knowledge in order to handle models
models. It provides readers with all relevant rock properties and their interrelationships in one concise volume.
physics provides an interdisciplinary treatment of physical properties, whether related to geophysical,
Nuclear Magnetic Resonance The interpretation of geophysical data in exploration geophysics, well logging,
fields of study together to apply new information and technology in new and more valuable ways. Enhance Oil
behavior. This multi-faceted approach pushes the boundaries of conventional modeling, and brings diverse
petrophysical contexts Data-driven modeling focuses on analyzing the total data within a system, with the goal
of uncovering connections between input and output without definitive knowledge of the system's physical
petrophysical context Learn how to get more information out of models and simulations Add value to everyday
increasing the value of your exploration data. Apply data-driven modeling concepts in a geophysical and
advances in machine learning are driving a rapid increase in empirical modeling capabilities. This book shows
book provides an essential resource for anyone involved in oil and gas exploration. Recent and continual
gas exploration with data-driven geophysical and petrophysical models takes you beyond traditional
geophysics and petrophysics. From data collection and context through real-world everyday applications, this
of this alternative analytical workflow, and in-depth discussion addresses the many Big Data issues in
data intelligence to gain deeper insight from specific exploration data. Case studies illustrate the value propositions
combined 30 years in the industry, this book shows you how to leverage continually maturing computational
The physical properties of rocks have been a growing area of study over the past several years. As data from geophysical, geological, petrophysical, engineering-related, and production-related sources are integrated, geoscientists must learn the technology, processes, and challenges involved to optimize planning for oil field development. Applied Techniques to Integrated Oil and Gas Reservoir Characterization presents challenging questions encountered by geoscientists in their day-to-day work in the exploration and development of oil and gas fields, along with potential solutions from experts. The text examines challenges in the industry as well as the techniques used to overcome those challenges.

The book includes valuable contributions from global industry experts, such as Brian Schulte (Schiefer Reservoir Consulting), Dr. Neil W. Craigie (Saudi Aramco), Matthijs van der Molen (Shell International E&P), Dr. Fred W. Schroeder (ExxonMobil, retired), Dr. Tharwat Hassane (Schlumberger & BP, retired), and others. It provides a thorough understanding of the requirements of various disciplines in characterizing a wide spectrum of reservoirs, along with real-life problems and challenging questions encountered by geoscientists in their day-to-day work, along with answers from experts working in the field. It offers an integrated approach among different disciplines (geology, geophysics, petrophysics, and petroleum engineering) and provides advice from industry experts to geoscience students, including career guides and interview tips.