

Properties Of Petroleum Fluids McCain Solution

Applied Drilling Engineering presents engineering science fundamentals as well as examples of engineering applications involving those fundamentals.

This book on PVT and Phase Behaviour Of Petroleum Reservoir Fluids is volume 47 in the Developments in Petroleum Science series. The chapters in the book are: Phase Behaviour Fundamentals, PVT Tests and Correlations, Phase Equilibria, Equations of State, Phase Behaviour Calculations, Fluid Characterisation, Gas Injection, Interfacial Tension, and Application in Reservoir Simulation.

Basic level textbook covering concepts and practical analytical techniques of reservoir engineering.

Natural gas is playing an increasing role in meeting world energy demands because of its abundance, versatility, and its clean burning nature. As a result, lots of new gas exploration, field development and production activities are under way, especially in places where natural gas until recently was labeled as "stranded". Because a significant portion of natural gas reserves worldwide are located across bodies of water, gas transportation in the form of LNG or CNG becomes an issue as well. Finally natural gas is viewed in comparison to the recently touted alternatives. Therefore, there is a need to have a book covering all the unique aspects and challenges related to natural gas from the upstream to midstream and downstream. All these new issues have not been addressed in depth in any existing book. To bridge the gap, Xiuli Wang and Michael Economides have written a new book called Advanced Natural Gas Engineering. This book will serve as a reference for all engineers and professionals in the energy business. It can also be a textbook for students in petroleum and chemical engineering curricula and in training departments for a large group of companies.

Theory and Practice of Measuring Reservoir Rock and Fluid Transport Properties

Applied Petroleum Reservoir Engineering

Characterization, Processes, and Applications

Working Guide to Reservoir Rock Properties and Fluid Flow

Hydrocarbon Exploration and Production

Accessible to anyone with an engineering background, this text reveals the importance of understanding rock and fluid properties in petroleum engineering. Along with new practice problems and detailed solved examples, this edition covers Stone II three-phase relative permeability model, unconventional oil and gas resources, low salinity water injection, saturated reservoirs and production trends of five reservoir fluids, impact of mud filtrate invasion and heavy organics on samples, and flow assurance problems due to solid components of petroleum. It also offers better plots for determining oil and water Corey exponents from relative permeability data.

PVT properties are necessary for reservoir/well performance forecast and optimization. In absence of PVT laboratory measurements, finding the right correlation to estimate accurate PVT properties could be challenging. PVT Property Correlations: Selection and Estimation discusses techniques to properly calculate PVT properties from limited information. This book covers how to prepare PVT properties for dry gases, wet gases, gas condensates, volatile oils, black oils, and low gas-oil ration oils. It also explains the use of artificial neural network models in generating PVT properties. It presents numerous examples to explain step-by-step procedures in using techniques designed to deliver the most accurate PVT properties from correlations. Complimentary to this book is PVT correlation calculator software. Many of the techniques used in this book are available with the software. This book shows the importance of PVT data, provides practical tools to calculate PVT properties, and helps engineers select PVT correlations so they can model, optimize, and forecast their assets. Understand how to prepare PVT data in absence of laboratory reports for all fluid types Become equipped with a comprehensive list of PVT correlations and their applicability ranges Learn about ANN models and their applications in providing PVT data Become proficient in selecting best correlations and improving correlations results

The petroleum geologist and engineer must have a working knowledge of petrophysics in order to find oil reservoirs, devise the best plan for getting it out of the ground, then start drilling. This book offers the engineer and geologist a manual to accomplish these goals, providing much-needed calculations and formulas on fluid flow, rock properties, and many other topics that are encountered every day. New updated material covers topics that have emerged in the petrochemical industry since 1997. Contains information and calculations that the engineer or geologist must use in daily activities to find oil and devise a plan to get it out of the ground Filled with problems and solutions, perfect for use in undergraduate, graduate, or professional courses Covers real-life problems and cases for the practicing engineer This book deals with complex fluid characterization of oil and gas reservoirs, emphasizing the importance of PVT parameters for practical application in reservoir simulation and management. It covers modeling of PVT parameters, QA/QC of PVT data from lab studies, EOS modeling, PVT simulation and compositional grading and variation. It describes generation of data for reservoir engineering calculations in view of limited and unreliable data and techniques like downhole fluid analysis and photophysics of reservoir fluids. It discusses behavior of unconventional reservoirs, particularly for difficult resources like shale gas, shale oil, coalbed methane, reservoirs, heavy and extra heavy oils.

Fundamentals of Reservoir Engineering

The Geological Interpretation of Well Logs

Hydrocarbon Phase Behavior

Standard Handbook of Petroleum and Natural Gas Engineering:

Surface Operations in Petroleum Production

A strong foundation in reservoir rock and fluid properties is the backbone of almost all the activities in the petroleum industry. Petroleum Reservoir Rock and Fluid Properties offers a reliable representation of fundamental concepts and practical aspects that encompass this vast subject area. The book provides up-to-date coverage of vari

Large sets of petroleum fluid data exist for the various reservoir conditions and properties that occur in practice. Petroleum Reservoir Fluid Property Correlations, written by three internationally well-known and respected petroleum engineers, is the result of several years of exhaustive research that gathered data sets from databases all over the world. The data were compared against the results of many published correlations of fluid properties in order to find the "best in class" required in the petroleum industry. Those findings are offered here as recommended use in reservoir engineering calculations. The data sets cover natural gases, reservoir oils, and reservoir waters (brines). The result of this research project is the best correlation for each fluid property. Key Features: * Best-in-class correlations contained in one volume * The most accurate data for reservoir engineering calculations * Correlations that cover all reservoir hydrocarbons and brines Petroleum Reservoir Fluid Property Correlations will prove to be a valuable resource for reservoir engineers, production engineers who need to determine which set of correlation equations are most useful for their work, and graduate-level reservoir engineering courses.

The last three chapters of this book deal with application of methods presented in previous chapters to estimate various thermodynamic, physical, and transport properties of petroleum fractions. In this chapter, various methods for prediction of physical and thermodynamic properties of pure hydrocarbons and their mixtures, petroleum fractions, crude oils, natural gases, and reservoir fluids are presented. As it was discussed in Chapters 5 and 6, properties of gases may be estimated more accurately than properties of liquids. Theoretical methods of Chapters 5 and 6 for estimation of thermophysical properties generally can be applied to both liquids and gases; however, more accurate properties can be predicted through empirical correlations particularly developed for liquids. When these correlations are developed with some theoretical basis, they are more accurate and have wider range of applications. In this chapter some of these semitheoretical correlations are presented. Methods presented in Chapters 5 and 6 can be used to estimate properties such as density, enthalpy, heat capacity, heat of vaporization, and vapor pressure. Characterization methods of Chapters 2-4 are used to determine the input parameters needed for various predictive methods. One important part of this chapter is prediction of vapor pressure that is needed for vapor-liquid equilibrium calculations of Chapter 9.

This publication is a general introduction to common openhole logging measurements, both wire line and MWD/LWD, and the interpretation of those measurements to determine the traditional analytical goals of porosity, fluid saturation, and lithology/mineralogy. It is arranged by the interpretation goals of the data, rather than by the underlying physics of the measurements. The appendix files contain digital versions of the data from the case studies, a summary guide to the measurements and their interpretation, and a simple spreadsheet containing some of the more common interpretation algorithms.

Applications for Improved Reservoir Modeling

Phase Behavior

Petroleum Reservoir Fluid Property Correlations

Phase Behavior of Petroleum Reservoir Fluids

An indispensable tool, Theory, Measurement and Interpretation of Well Logs introduces the three primary phases of well-logging technology to engineering and geosciences students. This text offers an in-depth study of the electric, radioactive, and acoustic properties of sedimentary rocks. Mathematical and empirical models relate a formation property of interest to the property measured with the logging tool. Openhole logging techniques are covered, along with concepts of traditional and modern tools. ADDITIONAL RESOURCES: You may want to consider this related SPE training course: Well Log Interpretation Essentials

With rapid changes in field development methods being created over the past few decades, there is a growing need for more information regarding energizing well production. Written by the world's most respected petroleum engineering authors, Well Productivity Handbook provides knowledge for modeling oil and gas wells with simple and complex trajectories. Covering critical topics, such as petroleum fluid properties, reservoir deliverability, wellbore flow performance and productivity of intelligent well systems, this handbook explains real-world applications illustrated with example problems.

Petroleum engineering now has its own true classic handbook that reflects the profession's status as a mature major engineering discipline. Formerly titled the Practical Petroleum Engineer's Handbook, by Joseph Zaba and W.T. Doherty (editors), this new, completely updated two-volume set is expanded and revised to give petroleum engineers a comprehensive source of industry standards and engineering practices. It is packed with the key, practical information and data that petroleum engineers rely upon daily. The result of a fifteen-year effort, this handbook the gamut of oil and gas engineering topics to provide a reliable source of engineering and reference information for analyzing and solving problems. It also reflects the growing role of natural gas in industrial development by integrating natural gas topics throughout both volumes. More than a dozen leading industry experts-academia and industry-contributed to this two-volume set to provide the best, most comprehensive source of petroleum engineering information available.

Advanced Reservoir Engineering offers the practicing engineer and engineering student a full description, with worked examples, of all of the kinds of reservoir engineering topics that the engineer will use in day-to-day activities. In an industry where there is often a lack of information, this timely volume gives a comprehensive account of the physics of reservoir engineering, a thorough knowledge of which is essential in the petroleum industry for the efficient recovery of hydrocarbons. Chapter one deals exclusively with the theory and practice of transient flow and offers a brief but thorough hands-on guide to gas and oil well testing. Chapter two documents water influx models and their practical applications in conducting comprehensive field studies, widely used throughout the industry. Later chapters include unconventional gas reservoirs and the classical adaptations of the material balance equation. * An essential tool for the petroleum and reservoir engineer, offering information not available anywhere else * Introduces the reader to cutting-edge developments in Type-Curve Analysis, unconventional gas reservoirs, and the Properties of Petroleum Fluids

The Properties of Petroleum Fluids

Petroleum Reservoir Rock and Fluid Properties

Applied Drilling Engineering

Properties of Petroleum Fluids

Reservoir Compartmentalization

"Reservoir compartmentalization - the segregation of a petroleum accumulation into a number of individual fluid/pressure compartments - controls the volume of moveable oil or gas that might be connected to any given well drilled in a field, and consequently impacts 'booking' of reserves and operational profitability. This is a general feature of modern exploration and production portfolios, and has driven major developments in geoscience, engineering and related technology. Given that compartmentalization is a consequence of many factors, an integrated subsurface approach is required to better understand and predict compartmentalization behaviour, and to minimize the risk of it occurring unexpectedly. This volume reviews our current understanding and ability to model compartmentalization. It highlights the necessity for effective specialist discipline integration, and the value of learning from operational experience in: detection and monitoring of compartmentalization; stratigraphic and mixed-mode compartmentalization; and fault-dominated compartmentalization" - Page 4 of cover.

Pressure Transient Testing presents the fundamentals of pressure-transient test analysis and design in clear, simple language and explains the theoretical bases of commercial well test-analysis software. Test-analysis techniques are illustrated with complete and clearly written examples. Additional exercises for classroom or individual practice are provided. With its focus on physical processes and mathematical interpretation, this book appeals to all levels of engineers who want to understand how modern approaches work. Pressure transient test analysis is a mature technology in petroleum engineering; even so, it continues to evolve. Because of the developments in this technology since the last SPE textbook devoted to transient testing was published, we concluded that students could benefit from a textbook approach to the subject that includes a representative sampling of the more important fundamentals and applications. We deliberately distinguish between a textbook approach, which stresses understanding through numerous examples and exercises dealing with selected fundamentals and applications, and a monograph approach, which attempts to summarize the state-of-the-art in the technology. Computational methods that transient test analysts use have gone through a revolution since most existing texts on the subject were written. Most calculations are now done with commercial software or by spreadsheets or proprietary software developed by users to meet personal needs and objectives. These advances in software have greatly increased productivity in this technology, but they also have contributed to a "black box" approach to test analysis. In this text, we attempt to explain what's in the box, and we do not include a number of the modern tools that enhance individual engineer productivity. We hope, instead, to provide understanding so that the student can use the commercial software with greater appreciation and so that the student can read monographs and papers on transient testing with greater appreciation for the context of the subject. Accordingly, this text is but an introduction to the vast field of pressure transient test analysis.

This book on hydrocarbon exploration and production is the first volume in the series Developments in Petroleum Science. The chapters are: The Field Life Cycle, Exploration, Drilling Engineering, Safety and The Environment, Reservoir Description, Volumetric Estimation, Field Appraisal, Reservoir Dynamic Behaviour, Well Dynamic Behaviour, Surface Facilities, Production Operations and Maintenance, Project and Contract Management, Petroleum Economics, Managing the Producing Field, and Decommissioning.

Petroleum can exist as either a liquid or a gas, either in the reservoir or on the trip to the surface. These properties are the basis for the chemistry of petroleum. This long-awaited new edition to William D. McCain's acclaimed text expands on the various compounds of this essential hydrocarbon. It includes new chapters on petroleum gas condensates and volatile oils, while the discussion on oilfield waters is extended. A vital resource for petroleum engineering students, The Properties of Petroleum Fluids, third edition, is equally useful as a reference for practicing engineers. New Features: - Two new chapters on gas condensates - A new chapter on volatile oils - A simplified explanation of phase behavior and an extended discussion of oilfield waters - An expanded review of the components of petroleum and the methods of determining its composition

Equations of State and PVT Analysis

Pressure Transient Testing

Theory, Measurement, and Interpretation of Well Logs

Selection and Estimation

Well Productivity Handbook

This edition expands its scope as a conveniently arranged petroleum fluids reference book for the practicing petroleum engineer and an authoritative college text.

Properties of Petroleum Fluids

This book introduces in detail the physical and chemical phenomena and processes during petroleum production. It covers the properties of reservoir rocks and fluids, the related methods of determining these properties, the phase behavior of hydrocarbon mixtures, the microscopic mechanism of fluids flowing through reservoir rocks, and the primary theories and methods of enhancing oil recovery. It also involves the up-to-date progress in these areas. It can be used as a reference by researchers and engineers in petroleum engineering and a textbook for students majoring in the area related with petroleum exploitation.

Understanding the phase behavior of the various fluids present in a petroleum reservoir is essential for achieving optimal design and cost-effective operations in a petroleum processing plant. Taking advantage of the authors' experience in petroleum processing under challenging conditions, Phase Behavior of Petroleum Reservoir Fluids introdu

Physics of Petroleum Reservoirs

Principles and Practice

Petroleum Fluid Phase Behavior

Characterization and Properties of Petroleum Fractions

Advanced Natural Gas Engineering

Understanding the properties of a reservoir's fluids and creating a successful model based on lab data and calculation are required for every reservoir engineer in oil and gas today, and with reservoirs becoming more complex, engineers and managers are back to reinforcing the fundamentals. PVT (pressure-volume-temperature) reports are one way to achieve better parameters, and Equations of State and PVT Analysis, 2nd Edition, helps engineers to fine tune their reservoir problem-solving skills and achieve better modeling and maximum asset development. Designed for training sessions for new and existing engineers, Equations of State and PVT Analysis, 2nd Edition, will prepare reservoir engineers for complex hydrocarbon and natural gas systems with more sophisticated EOS models, correlations and examples from the hottest locations around the world such as the Gulf of Mexico, North Sea and China, and Q&A at the end of each chapter. Resources are maximized with this must-have reference. Improve with new material on practical applications, lab analysis, and real-world sampling from wells to gain better understanding of PVT properties for crude and natural gas Sharpen your reservoir models with added content on how to tune EOS parameters accurately Solve more unconventional problems with field examples on phase behavior characteristics of shale and heavy oil

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. Ekweje 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.

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 need for this book has arisen from demand for a current text from our students in Petroleum Engineering at Imperial College and from post-experience Short Course students. It is, however, hoped that the material will also be of more general use to practising petroleum engineers and those wishing for an introduction into the specialist literature. The book is arranged to provide both background and overview into many facets of petroleum engineering, particularly as practised in the offshore environments of North West Europe. The material is largely based on the authors' experience as teachers and consultants and is supplemented by worked problems where they are believed to enhance understanding. The authors would like to express their sincere thanks and appreciation to all the people who have helped in the preparation of this book by technical comment and discussion and by giving permission to reproduce material. In particular we would like to thank our present colleagues and students at Imperial College and at ERC Energy Resource Consultants Ltd. for their stimulating company. Jill and Janel for typing seemingly endless manuscripts; Dan Smith at Graham and Trotman Ltd. for his perseverance and optimism; and Lesley and Joan for believing that one day things would return to normality. John S. Archer and Colin G. Wall 1986 ix

Foreword Petroleum engineering has developed as an area of study only over the present century. It now provides the technical basis for the exploitation of petroleum fluids in subsurface sedimentary rock reservoirs.

Principles of Applied Reservoir Simulation

Petroleum Engineering

Challenges and Opportunities

Reservoir Engineering Handbook

Petrophysics

"This book is fast becoming the standard text in its field", wrote a reviewer in the Journal of Canadian Petroleum Technology soon after the first appearance of **Dake's book**. This prediction quickly came true: it has become the standard text and has been reprinted many times. The author's aim - to provide students and teachers with a coherent account of the basic physics of reservoir engineering - has been most successfully achieved. No prior knowledge of reservoir engineering is necessary. The material is dealt with in a concise, unified and applied manner, and only the simplest and most straightforward mathematical techniques are used. This low-priced paperback edition will continue to be an invaluable teaching aid for years to come.

Working Guide to Reservoir Rock Properties and Fluid Flow provides an introduction to the properties of rocks and fluids that are essential in petroleum engineering. The book is organized into three parts. Part 1 discusses the classification of reservoirs and reservoir fluids. Part 2 explains different rock properties, including porosity, saturation, wettability, surface and interfacial tension, permeability, and compressibility. Part 3 presents the mathematical relationships that describe the flow behavior of the reservoir fluids. The primary reservoir characteristics that must be considered include: types of fluids in the reservoir, flow regimes, reservoir geometry, and the number of flowing fluids in the reservoir. Each part concludes with sample problems to test readers knowledge of the topic covered. Critical properties of reservoir rocks Fluid (oil, water, and gas) PVT relationships Methods to calculate hydrocarbons initially in place Dynamic techniques to assess reservoir performance Parameters that impact well/reservoir performance over time

What makes this book so different and valuable to the engineer is the accompanying software, used by reservoir engineers all over the world every day. The new software, IFLO (replacing WINB4D, in previous editions), is a simulator that the engineer can easily install in a Windows operating environment. IFLO generates simulations of how the well can be tapped and feeds this to the engineer in dynamic 3D perspective. This completely new software is much more functional, with better graphics and more scenarios from which the engineer can generate simulations. BENEFIT TO THE READER: This book and software helps the reservoir engineer do his or her job on a daily basis, better, more economically, and more efficiently. Without simulations, the reservoir engineer would not be able to do his or her job at all, and the technology available in this product is far superior to most companies internal simulation software.-

Phase Behavior provides the reader with the tools needed to solve problems requiring a description of phase behavior and specific pressure/volume/temperature (PVT) properties.

Basic Well Log Analysis

Properties of Petroleum Reservoir Fluids

PVT and Phase Behaviour Of Petroleum Reservoir Fluids

Processing of Heavy Crude Oils

Advanced Petrophysics: Geology, porosity, absolute permeability, heterogeneity, and geostatistics

The job of any reservoir engineer is to maximize production from a field to obtain the best economic return. To do this, the engineer must study the behavior and characteristics of a petroleum reservoir to determine the course of future development and production that will maximize the profit. Fluid flow, rock properties, water and gas coning, and relative permeability are only a few of the concepts that a reservoir engineer must understand to do the job right, and some of the tools of the trade are water influx calculations, lab tests of reservoir fluids, and oil and gas performance calculations.Two new chapters have been added to the first edition to make this book a complete resource for students and professionals in the petroleum industry: Principles of Waterflooding, Vapor-Liquid Phase Equilibria.

PVT Property Correlations

Asphaltenes, Heavy Oils, and Petroleomics

Advanced Reservoir Engineering