

DEVELOPMENTS IN PETROLEUM SCIENCE 12

fundamentals of fractured reservoir engineering

BY

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ELSEVIER

Fundamentals Of Fractured Reservoir Engineering

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Fundamentals Of Fractured Reservoir Engineering:

Fundamentals of Fractured Reservoir Engineering T.D. van Golf-Racht, 1982-04-01 In the modern language of reservoir engineering by reservoir description is understood the totality of basic local information concerning the reservoir rock and fluids which by various procedures are extrapolated over the entire reservoir Fracture detection evaluation and processing is another essential step in the process of fractured reservoir description In chapter 2 all parameters related to fracture density and fracture intensity together with various procedures of data processing are discussed in detail After a number of field examples developed in Chap 3 the main objective remains the quantitative evaluation of physical properties This is done in Chap 4 where the evaluation of fractures porosity and permeability their correlation and the equivalent ideal geometrical models versus those parameters are discussed in great detail Special rock properties such as capillary pressure and relative permeability are reexamined in the light of a double porosity reservoir rock In order to complete the results obtained by direct measurements on rock samples Chap 5 examines fracturing through indirect measurements from various logging results The entire material contained in these five chapters defines the basic physical parameters and indicates procedures for their evaluation which may be used further in the description of fractured reservoirs

Fundamentals of Fractured Reservoir Engineering Theodor D. Golf-Racht, 1982 *Essentials of Reservoir Engineering* Pierre Donnez, 2012

Contents of volumes 1 and 2 give a general view of the essential material knowledge for students and professionals Opportunity for deeper investigation is available from the extensive complementary references featured

Well Test Analysis for Fractured Reservoir Evaluation G. Da Prat, 1990-11-19 The main purpose of this book is to provide the reader with a basic understanding of the behaviour of fractured reservoirs using evaluation techniques based on processing pressure and flow rate data resulting from production testing It covers the fundamental reservoir engineering principles involved in the analysis of fluid flow through fractured reservoirs the application of existing models to field cases and the evaluation and description of reservoirs based on processed data from pressure and production tests The author also discusses production decline analysis the understanding of which is a key factor influencing completion or abandonment of a well or even a field The theoretical concepts are presented as clearly and simply as possible in order to aid comprehension The book is thus suitable for training and educational purposes and will help the reader who is unfamiliar with the subject acquire the necessary skills for successful interpretation and analysis of field data One of the most important features of the book is that it fills the gap between field operations and research in regard to proper management of reservoirs The book also contains a computer program FORTRAN language which can be incorporated in existing software designed for reservoir evaluation type curves generation test design and interpretation can be achieved by using this program Petroleum engineers reservoir engineers petroleum geologists research engineers and students in these fields will be interested in this book as a reference source It can also be used as a text book for training production and reservoir engineering professionals It should

be available in university and oil company libraries *Principles of Applied Reservoir Simulation* John R. Fanchi, 2005-12-08
 Simulate reservoirs effectively to extract the maximum oil gas and profit with this book and free simulation software on companion web site **Geologic Analysis of Naturally Fractured Reservoirs** Ronald Nelson, 2001-08-24 Geologists engineers and petrophysicists concerned with hydrocarbon production from naturally fractured reservoirs will find this book a valuable tool for obtaining pertinent rock data to evaluate reserves and optimize well location and performance Nelson emphasizes geological petrophysical and rock mechanics to complement other studies of the subject that use well logging and classical engineering approaches This well organized updated edition contains a wealth of field and laboratory data case histories and practical advice A great how to guide for anyone working with fractured or highly anisotropic reservoirs Provides real life illustrations through case histories and field and laboratory data **Drilling Geomechanics in Naturally Fractured Reservoirs Near Salt Structures** Juan Pedro Morales Salazar, 2024-04-30 This book explains different phenomena that occur in Naturally Fractured Reservoirs NFRs of carbonate rocks neighboring a salt structure and how it affects well drilling Prediction of carbonate pore pressure is difficult therefore a new set of pore pressure equations for carbonates were developed accounting for overpressure and depleted conditions A detailed description of a fully coupled model is shown in order to discuss geomechanics and the coupling of fluid flow in porous media and to achieve a better representation of the mechanics involved in the exploitation of NFRs Additionally results of a new model of geomechanics in vuggy carbonate reservoirs are presented This book also displays a wide discussion analysis and numerical implementation of six different salt rheology models Furthermore the most representative rheology salt models were studied aside with the fully coupled model of geomechanics and fluid flow in porous media Finally it presents an answer to areal case of a well drilled near a salt diapir where anomalous pore pressure was found **The Practice of Reservoir Engineering** L.P. Dake, 2013-10-22 The Practice of Reservoir Engineering has been written for those in the oil industry requiring a working knowledge of how the complex subject of hydrocarbon reservoir engineering can be applied in the field in a practical manner The book is a simple statement of how to do the job and is particularly suitable for reservoir production engineers and is illustrated with 27 examples and exercises based mainly on actual field developments It will also be useful for those associated with the subject of hydrocarbon recovery Geoscientists petrophysicists and those involved in the management of oil and gas fields will also find it particularly relevant The new <http://www.elsevier.nl/locate/isbn-0444506705> Practice of Reservoir Engineering Revised Edition will be available soon *Applied Concepts in Fractured Reservoirs* John C. Lorenz, Scott P. Cooper, 2020-01-13 A much needed precise and practical treatment of a key topic in the energy industry and beyond Applied Concepts in Fractured Reservoirs is an invaluable reference for those in both industry and academia Authored by renowned experts in the field this book covers the understanding evaluation and effects of fractures in reservoirs It offers a comprehensive yet practical discussion and description of natural fractures their origins characteristics

and effects on hydrocarbon reservoirs It starts by introducing the reader to basic definitions and classifications of fractures and fractured reservoirs It then provides an outline for fractured reservoir characterization and analysis and goes on to introduce the way fractures impact operational activities Well organized and clearly illustrated throughout Applied Concepts in Fractured Reservoirs starts with a section on understanding natural fractures It looks at the different types their dimensions and the mechanics of fracturing rock in extension and shear The next section provides information on measuring and analyzing fractures in reservoirs It covers logging core for fractures taking measuring and analyzing fracture data new core vs archived core CT scans comparing fracture data from outcrops core and logs and more The last part examines the effects of natural fractures on reservoirs including the permeability behavior of individual fractures and fracture systems fracture volumetrics effects of fractures on drilling and coring and the interaction between natural and hydraulic fractures Teaches readers to understand and evaluate fractures Compiles and synthesizes various concepts and descriptions scattered in literature and synthesizes them with unpublished oil field observations and data along with the authors own experience Bridges some of the gaps between reservoir engineers and geologists Provides an invaluable reference for geologists and engineers who need to understand naturally fractured reservoirs in order to efficiently extract hydrocarbons Illustrated in full color throughout Companion volume to the Atlas of Natural and Induced Fractures in Core *Fundamentals and Practical Aspects of Gas Injection* Reza Azin, Amin Izadpanahi, 2021-07-28 This book covers different aspects of gas injection from the classic pressure maintenance operation to enhanced oil recovery EOR underground gas storage UGS and carbon capture and storage CCS The authors detail the unique characteristics and specific criteria of each application including material balance equations phase behaviour reservoir engineering well design operating aspects surface facilities environmental issues Examples data and simulation codes are provided to enable the reader to gain an in depth understanding of these applications Fundamentals and Practical Aspects of Gas Injection will be of use to practising engineers in the fields of reservoir engineering and enhanced oil recovery It will also be of interest to researchers academics and graduate students working in the field of petroleum engineering

Carbonate Reservoir Characterization: A Geologic-Engineering Analysis, Part I G.C. Dominguez, F. Samaniego V., 1992-01-17 This book integrates those critical geologic aspects of reservoir formation and occurrence with engineering aspects of reservoirs and presents a comprehensive treatment of the geometry porosity and permeability evolution and producing characteristics of carbonate reservoirs The three major themes discussed are the geometry of carbonate reservoirs and relationship to original depositional facies distributions the origin and types of porosity and permeability systems in carbonate reservoirs and their relationship to post depositional diagenesis the relationship between depositional and diagenetic facies and producing characteristics of carbonate reservoirs and the synergistic geologic engineering approach to the exploitation of carbonate reservoirs The intention of the volume is to fully acquaint professional petroleum geologists and engineers with an integrated geologic and

engineering approach to the subject As such it presents a unique critical appraisal of the complex parameters that affect the recovery of hydrocarbon resources from carbonate rocks The book may also be used as a text in petroleum geology and engineering courses at the advanced undergraduate and graduate levels *Carbonate Reservoir Characterization: A Geologic-Engineering Analysis, Part II* S.J. Mazzullo,H.H. Rieke,G.V. Chilingarian,1996-11-22 This second volume on carbonate reservoirs completes the two volume treatise on this important topic for petroleum engineers and geologists Together the volumes form a complete modern reference to the properties and production behaviour of carbonate petroleum reservoirs The book contains valuable glossaries to geologic and petroleum engineering terms providing exact definitions for writers and speakers Lecturers will find a useful appendix devoted to questions and problems that can be used for teaching assignments as well as a guide for lecture development In addition there is a chapter devoted to core analysis of carbonate rocks which is ideal for laboratory instruction Managers and production engineers will find a review of the latest laboratory technology for carbonate formation evaluation in the chapter on core analysis The modern classification of carbonate rocks is presented with petroleum production performance and overall characterization using seismic and well test analyses Separate chapters are devoted to the important naturally fractured and chalk reservoirs Throughout the book the emphasis is on formation evaluation and performance This two volume work brings together the wide variety of approaches to the study of carbonate reservoirs and will therefore be of value to managers engineers geologists and lecturers

Fractured Vuggy Carbonate Reservoir Simulation Jun Yao,Zhao-Qin Huang,2017-08-08 This book solves the open problems in fluid flow modeling through the fractured vuggy carbonate reservoirs Fractured vuggy carbonate reservoirs usually have complex pore structures which contain not only matrix and fractures but also the vugs and cavities Since the vugs and cavities are irregular in shape and vary in diameter from millimeters to meters modeling fluid flow through fractured vuggy porous media is still a challenge The existing modeling theory and methods are not suitable for such reservoir It starts from the concept of discrete fracture and fracture vug networks model and then develops the corresponding mathematical models and numerical methods including discrete fracture model discrete fracture vug model hybrid model and multiscale models Based on these discrete porous media models some equivalent medium models and methods are also discussed All the modeling and methods shared in this book offer the key recent solutions into this area

Quantitative Methods in Reservoir Engineering Wilson C Chin,2016-10-01 Quantitative Methods in Reservoir Engineering Second Edition brings together the critical aspects of the industry to create more accurate models and better financial forecasts for oil and gas assets Updated to cover more practical applications related to intelligent infill drilling optimized well pattern arrangement water flooding with modern wells and multiphase flow this new edition helps reservoir engineers better lay the mathematical foundations for analytical or semi analytical methods in today s more difficult reservoir engineering applications Authored by a worldwide expert on computational flow modeling this reference integrates current mathematical methods to aid in understanding more complex

well systems and ultimately guides the engineer to choose the most profitable well path The book delivers a valuable tool that will keep reservoir engineers up to speed in this fast paced sector of the oil and gas market Stay competitive with new content on unconventional reservoir simulation Get updated with new material on formation testing and flow simulation for complex well systems and paths Apply methods derived from real world case studies and calculation examples *A Practical Companion to Reservoir Stimulation* M.J. Economides, 1992-01-03 This workbook is a practical companion to the second edition of the textbook Reservoir Stimulation The two books are intended to be used together This new volume should be particularly useful for the training of new engineers and petroleum engineering students as it contains approximately 100 problems and their solutions plus a lengthy chapter giving data necessary for designing a stimulation treatment Chapters are included containing practical problems on reservoir and well considerations rock mechanics fracturing fluids and proppants fracture calibration treatments design and modeling of propped fractures evaluation of fracture treatments design of matrix treatments diversion and treatment evaluation design and performance of acid fractures and stimulation of horizontal wells These chapters are labeled with letters from A to J to distinguish them from their companion chapters in Reservoir Stimulation Equations figures and tables from the textbook are referred to in the workbook but are not reproduced

Reservoir Engineering in Modern Oilfields Wilson C. Chin, 2016-07-26 Real world reservoirs are layered heterogeneous and anisotropic exposed to water and gas drives faults barriers and fractures They are produced by systems of vertical deviated horizontal and multilateral wells whose locations sizes shapes and topologies are dictated on the fly at random by petroleum engineers and drillers at well sites Wells may be pressure or rate constrained with these roles re assigned during simulation with older laterals shut in newer wells drilled and brought on stream and so on And all are subject to steady and transient production each satisfying different physical and mathematical laws making reservoir simulation an art difficult to master and introducing numerous barriers to entry All of these important processes can now be simulated in any order using rapid stable and accurate computational models developed over two decades And what if it were further possible to sketch complicated geologies and lithologies plus equally complex systems of general wells layer by layer using Windows Notepad And with no prior reservoir simulation experience and only passing exposure to reservoir engineering principles Have the user press Simulate and literally within minutes produce complicated field wide results production forecasts and detailed three dimensional color pressure plots from integrated graphics algorithms Developed over years of research this possibility has become reality The author an M I T trained scientist who has authored fifteen original research books over a hundred papers and forty patents winner of a prestigious British Petroleum Chairman s Innovation Award in reservoir engineering and a record five awards from the United States Department of Energy has delivered just such a product making real time planning at the well site simple and practical Workflows developed from experience as a practicing reservoir engineer are incorporated into intelligent menus that make in depth understanding of simulation principles and readings of user manuals

unnecessary This volume describes new technology for down to earth problems using numerous examples performed with our state of the art simulator one that is available separately at affordable cost and requiring only simple Intel Core i5 computers without specialized graphics boards The new methods are rigorous validated and well documented and are now available for broad petroleum industry application

Hydrocarbon Seals P. Møller-Pedersen, A.G. Koestler, 1997-12-18 In January 1996 a total of 270 conference participants gathered for 3 days in Trondheim Norway to focus on and to discuss the complex topic of hydrocarbon seals particularly related to deformation zones and to caprocks The conference was the first in Norway and one of the first in Europe to exclusively address this very important subject The purpose of the conference was to present some of the most recent research results to establish state of the art with respect to understanding hydrocarbon seals and to discuss where to go from here to find some of the keys to successful future exploration and enhanced oil and gas recovery Out of the presented papers and posters 17 are compiled and published in this volume These provide a good overview of and an introduction to the numerous aspects covered during the fruitful days in Trondheim

Fractures and Fracture Networks P.M. Adler, J.-F. Thovert, 2013-03-09 Both the beauty and interest of fractures and fracture networks are easy to grasp since they are abundant in nature An example is the road from Digne to Nice in the south of France with an impressive number and variety of such structures the road for the most part goes through narrow valleys with fast running streams penetrating the rock faces erosion is favored by the Mediterranean climate so that rocks are barely covered by meager vegetation In this inhospitable and sterile landscape the visitor can immediately discover innumerable fractures in great masses which have been distorted by slow yet powerful movements This phenomenon can be seen for about 100 kilometers all kinds of shapes and combinations are represented and can be observed either in the mountain itself or in the man made cliffs and excavations resulting from improvements made to the road In the same region close to the Turini Pass a real large scale hydrodynamic experiment is taking place a source which is situated on the flank on the mountain has been equipped with a tap if the tap is open water flows through the tap only but when it is closed then the side of the mountain releases water in a matter of seconds Other outlets are also influenced by this tap such as a water basin situated a few hundred meters away

Rock Testing and Site Characterization J.A. Hudson, 2014-06-16 Rock Testing and Site Characterization

Carbonate Reservoir Rocks Ksenia I. Bagrintseva, 2015-07-29 Most of the world's energy still comes from fossil fuels and there are still many strides being made in the efficiency and cost effectiveness of extracting these important and increasingly more elusive natural resources This is only possible if the nature of the emergence evolution and parameter estimation of high grade reservoir rocks at great depths is known and a theory of their forecast is developed Over 60 percent of world oil production is currently associated with carbonate reservoir rocks The exploration appraisal and development of these fields are significantly complicated by a number of factors These factors include the structural complexity of the carbonate complexes variability of the reservoir rock types and properties within a particular deposit many

unknowns in the evaluation of fracturing and its spatial variability and the preservation of the reservoir rock qualities with depth. The main objective of most studies is discovering patterns in the reservoir rock property changes of carbonate deposits of different genesis, composition, and age. A short list of the unsolved issues includes the role of facies environment in the carbonate formation, the major geologic factors affecting the formation of high capacity reservoir rocks, and preservation of their properties. Recommendations as to the use of the new techniques in studies of the structural parameters and establishing a correlation between the major evaluation parameters. The focus of this volume is to show the scientific and engineering community a revolutionary process. The author perfected an earlier developed methodology in studies of the void space structure. Bagrintseva's method (1982). This methodology is based on carbonate rock saturation with luminophore and on special techniques in processing of photographs made under UV light. The luminophore technique was combined with the raster electron microscopy and its variation, the studies under the cathode luminescence regime. This combination enabled a more detailed study of the reservoir void space, the nonuniformity in the open fracture evolution, their morphology, length, and variability of openness. Over recent years, these techniques have found wide application. Useful for the veteran engineer or scientist and the student alike, this book is a must have for any geologist, engineer, or student working in the field of upstream petroleum engineering.

Unveiling the Magic of Words: A Review of "**Fundamentals Of Fractured Reservoir Engineering**"

In a world defined by information and interconnectivity, the enchanting power of words has acquired unparalleled significance. Their capability to kindle emotions, provoke contemplation, and ignite transformative change is actually awe-inspiring. Enter the realm of "**Fundamentals Of Fractured Reservoir Engineering**," a mesmerizing literary masterpiece penned by a distinguished author, guiding readers on a profound journey to unravel the secrets and potential hidden within every word. In this critique, we shall delve to the book is central themes, examine its distinctive writing style, and assess its profound impact on the souls of its readers.

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Fundamentals Of Fractured Reservoir Engineering Introduction

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