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# Paul Glover Petrophysics

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Geomechanics and Geology  
 Porous Media  
 Sediment Diagenesis  
 Reservoir Characterization  
 Gas Breakthrough  
 A Dictionary of Mining, Mineral, and Related Terms  
 Practical Petrophysics  
 Carbonate Reservoir Characterization  
 Principles of Mathematical Petrophysics  
 Properties of Reservoir Rocks: Core Analysis  
 Physical Properties of Rocks  
 Fundamentals of Reservoir Rock Properties  
 2009 Joint Assembly Abstracts, 24-27 May 2009, Toronto, Ontario, Canada  
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 Fossil Energy Update

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## LEE WEBER

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**Geomechanics and Geology** AAPG  
 Internship Report from the year 2013 in  
 the subject Geography / Earth Science -  
 Miscellaneous, grade: 2,7, RWTH Aachen  
 University (Lehrstuhl für Geologie,  
 Geochemie und Lagerstätten des Erdöls  
 und der Kohle), course: Petrophysics  
 Practical Course, language: English,  
 abstract: By inducing a gas (non-wetting  
 fluid) into a water saturated rock, the gas  
 will displace the water (wetting fluid), but  
 this process just take place, when the  
 capillary pressure is above the capillary  
 entry pressure (gas pressure difference).  
 First the largest pores near the sample  
 surface are drained (drainage process). At  
 higher capillary pressures even the

smallest pores are filled with gasThe  
 relation between capillary pressure and  
 pore radius is given by the Washburn  
 equation (1921), "The intrusion of a non-  
 wetting fluid into a cylindrical capillary of  
 radius  $r$  only occurs if the capillary  
 pressure  $P_c$  [...] within a pore is  
 exceeded": [...]

**Porous Media** Geological Society of  
 America

A comprehensive text on resistivity and  
 induced polarization covering theory and  
 practice for the near-surface Earth  
 supported by modelling software.  
Sediment Diagenesis Walter de Gruyter  
 GmbH & Co KG  
 During last decade significant progress  
 has been made in the oil indus try by  
 using soft computing technology.  
 Underlying this evolving technology there  
 have, been ideas transforming the very

language we use to describe problems  
 with imprecision, uncertainty and partial  
 truth. These developments offer exciting  
 opportunities, but at the same time it is  
 becoming clearer that further  
 advancements are confronted by funda  
 mental problems. The whole idea of how  
 human process information lies at the core  
 of the challenge. There are already new  
 ways of thinking about the problems  
 within theory of perception-based  
 information. This theory aims to  
 understand and harness the laws of  
 human perceptions to dramatically im  
 prove the processing of information. A  
 matured theory of perception-based  
 information is likely to be proper  
 positioned to contribute to the solution of  
 the problems and provide all the  
 ingredients for a revolution in science,  
 technology and business. In this context,

Berkeley Initiative in Soft Computing (BISC), University of California, Berkeley from one side and Chevron-Texaco from another formed a Technical Committee to organize a Meeting entitled "State of the Art Assessment and New Directions for Research" to understand the significance of the fields' accomplishments, new developments and future directions. The Technical Committee selected and invited 15 scientists (and oil industry experts as technical committee members) from the related disciplines to participate in the Meeting, which took place at the University of California, Berkeley, and March 15-17, 2002.

**Reservoir Characterization** GRIN Verlag

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. Topics addressed in volume 2 (chapters 5-8) include - Dispersion in porous media - Interfacial phenomena and wettability - Capillary pressure - Relative permeability. 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.

**Gas Breakthrough** Geological Society of London

The pioneering work of Gus Archie moved log interpretation into log analysis with the introduction of the equation that bears his name. Subsequent developments have mixed empiricism, physics, mathematical algorithms, and geological or engineering models as methods applied to petrophysical measurements in boreholes all over the world. Principles of

Mathematical Petrophysics reviews the application of mathematics to petrophysics in a format that crystallizes the subject as a subdiscipline appropriate for the workstations of today. The subject matter is of wide interest to both academic and industrial professionals who work with subsurface data applied to energy, hydrology, and environmental issues. This book is the first of its kind, in that it addresses mathematical petrophysics as a distinct discipline. Other books in petrophysics are either extensive descriptions of tool design or interpretation techniques, typically in an ad hoc treatment. It covers mathematical methods that are applied to borehole and core petrophysical measurements to estimate rock properties of fluid saturation, pore types, permeability, mineralogy, facies, and reservoir characterization. These methods are demonstrated by a variety of case studies and summaries of applications. Principles of Mathematical Petrophysics is an invaluable resource for all people working with data related to petrophysics.

**A Dictionary of Mining, Mineral, and Related Terms** John Wiley & Sons

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

**Practical Petrophysics** John Wiley & Sons

The oil industry has, in the last decade, seen successful applications of nanotechnology in completion systems, completion fluids, drilling fluids, and in improvements of well constructions, equipment, and procedures. However, very few full field applications of nanoparticles as an additive to injection fluids for enhanced oil recovery (EOR) have been reported. Many types of chemical enhanced oil recovery methods have been used in fields all over the world for many decades and have resulted in higher recovery, but the projects have very often not been economic. Therefore, the oil industry is searching for a more efficient enhanced oil recovery method. Based on the success of nanotechnology in various areas of the oil industry, nanoparticles have been extensively studied as an additive in injection fluids for EOR. This book includes a selection of research articles on the use of nanoparticles for EOR application. The articles are discussing nanoparticles as additive in waterflooding and surfactant flooding, stability and wettability alteration ability of nanoparticles and nanoparticle stabilized foam for CO<sub>2</sub>-EOR. The book also includes articles on nanoparticles as an additive in biopolymer flooding and

studies on the use of nanocellulose as a method to increase the viscosity of injection water. Mathematical models of the injection of nanoparticle-polymer solutions are also presented.

**Carbonate Reservoir Characterization**

Springer Science & Business Media

A practical introduction perfect for final-year undergraduate and graduate students without a solid background in linear algebra and calculus.

**Principles of Mathematical Petrophysics**

Elsevier Science & Technology

This book focuses on the methods of storage commonly used in hybrid systems. After an introductory chapter reviewing the basics of electrochemistry, Chapter 2 is given over to the storage of electricity in the form of hydrogen. Once hydrogen has been made, we have to be able to convert it back into electricity on demand. This can be done with another energy converter: a fuel cell, the subject of Chapter 3. Such a system is unable to deliver significant dynamics in terms of storage and release of electricity and needs to be supplemented with another solution: a detailed study of supercapacitors is provided in Chapter 4. While the storage systems touched upon in the previous three chapters (hydrogen batteries and supercapacitors) both exhibit advantageous characteristics, at present they are still relatively costly. Thus, the days of the electrochemical accumulator by no means appear to be numbered just yet. This will therefore be the topic of Chapter 5. Finally, on the basis of the elements laid down in the previous chapters, Chapter 6 will focus on electrical hybridization of these storage systems, with a view to enhancing the performance (in terms of energy, lifetime, cost, etc.) of the newly formed system. Aimed at an audience of researchers, industrialists, academics, teachers and students, many exercises, along with corrected solutions, are provided throughout the book.

Contents 1. Basic Concepts of Electrochemistry used in Electrical Engineering. 2. Water Electrolyzers. 3. Fuel Cells. 4. Electrical Energy Storage by Supercapacitors. 5. Electrochemical Accumulators. 6. Hybrid Electrical System. About the Authors Marie-Cécile Péra is a Full Professor at the University of Franche-Comte in France and Deputy Director of the FEMTO-ST Institute (CNRS). Her research activities include modeling, control and diagnosis of electric power generation systems (fuel cells - PEMFC and SOFC, supercapacities, batteries) for transportation and stationary applications. She has contributed to more than 180 articles in international journals and

conferences. Daniel Hissel is Full Professor at the University of Franche-Comte in France and Director of the Fuel Cell Lab Research Federation (CNRS). He also leads a research team devoted to hybrid electrical systems in the FEMTO-ST Institute (CNRS). He has published more than 250 research papers on modeling, control, diagnostics and prognostics of hybrid electrical systems. Hamid Gualous is Full Professor at the University of Caen Lower Normandy in France and director of the LUSAC laboratory. His current research interests include power electronics, electric energy storage, power and energy systems and energy management. Christophe Turpin is Full Researcher at the CNRS (French National Center for Scientific Research). He is responsible for hydrogen activities within the Laboratory LAPLACE, Toulouse, France. His research activities include the characterization and modeling of fuel cells and electrolyzers, the state of health of these components, and their hybridization with other electrochemical components (ultracapacitors, batteries) within optimized energy systems for stationary and aeronautical applications.

*Properties of Reservoir Rocks: Core Analysis* Springer Science & Business Media

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.

*Physical Properties of Rocks* International Association for Reservoir Characterization is a collection of papers presented at the Reservoir Characterization Technical Conference, held at the Westin Hotel-Galleria in Dallas on April 29-May 1, 1985. Conference held April 29-May 1, 1985, at the Westin Hotel—Galleria in Dallas. The conference was sponsored by the National Institute for Petroleum and Energy Research, Bartlesville, Oklahoma. Reservoir characterization is a process for quantitatively assigning reservoir properties, recognizing geologic information and uncertainties in spatial variability. This book contains 19 chapters, and begins with the geological characterization of sandstone reservoir, followed by the geological prediction of shale distribution within the Prudhoe Bay field. The subsequent chapters are devoted to determination of reservoir properties, such as porosity, mineral occurrence, and permeability variation estimation. The discussion then shifts to the utility of a Bayesian-type formalism to delineate qualitative "soft" information and expert interpretation of reservoir description data. This topic is followed by papers concerning reservoir simulation, parameter assignment, and method of calculation of wetting phase relative permeability. This text also deals with the role of discontinuous vertical flow barriers in reservoir engineering. The last chapters focus on the effect of reservoir heterogeneity on oil reservoir. Petroleum engineers, scientists, and researchers will find this book of great value.

*Fundamentals of Reservoir Rock Properties* Elsevier

Petrophysics is the study of the physical properties of rocks in the broadest sense. It provides the fundamental understanding that enables geologists to describe the physical state of a rock, to predict its behaviour and to interpret geophysical data. This volume includes developments in pore-scale studies, electrical properties, seismic methods and measurement techniques, as well as reviewing aspects of petrophysical prediction and interpretation.

*2009 Joint Assembly Abstracts, 24-27 May 2009, Toronto, Ontario, Canada* Academic Press

Soft Computing has come of age. In particular, Artificial Neural Networks, Fuzzy Logic and Evolutionary Computing now play an important role in many

domains where traditional techniques have been found wanting. As this volume confirms, hybrid solutions that combine more than one of the Soft Computing approaches are particularly successful in many problem areas. This volume contains papers presented at the International Conference on Recent Advances in Soft Computing 2000 at De Montfort University in Leicester. The contributions cover both theoretical developments and practical applications in the various areas of Soft Computing.

*Physics of Petroleum Reservoirs* Greenleaf Book Group

This book presents a complete review of the unique instruments and the communication technologies utilized in downhole drilling environments. These instruments and communication technologies play a critical role in drilling hydrocarbon wells safely, accurately and efficiently into a target reservoir zone by acquiring information about the surrounding geological formations as well as providing directional measurements of the wellbore. Research into instruments and communication technologies for hydrocarbon drilling has not been explored by researchers to the same extent as other fields, such as biomedical, automotive and aerospace applications. Therefore, the book serves as an opportunity for researchers to truly understand how instruments and communication technologies can be used in a downhole environment and to provide fertile ground for research and development in this area. A look ahead, discussing other technologies such as micro-electromechanical-systems (MEMS) and fourth industrial revolution technologies such as automation, the industrial internet of things (IIoT), artificial intelligence, and robotics that can potentially be used in the oil/gas industry are also presented, as well as requirements still need to be met in order to deploy them in the field.

*Instruments, Measurement Principles and Communication Technologies for Downhole Drilling Environments* John Wiley & Sons

The topic of sediment diagenesis is of fundamental importance to industry in the evaluation of hydrocarbon and water reservoir rocks. Detailed knowledge of the diagenetic textures, fabrics, and minerals, and a prediction of the regional diagenetic response, partly controls hydrocarbon recovery programmes. In other words, knowledge of the diagenesis can aid (or even control) conservation policy. Similarly, facies and diagenetic trends within basins can influence exploration



policy. This volume incorporates the majority of the principal contributions given to the NATO Advanced Study Institute held in the University of Reading, U.K., from July 12th-25th, 1981, at which the major themes of carbonate and terrigenous clastic sediments were treated sequentially from deposition to deep burial. Eighty selected scientists from twelve NATO and three other countries participated in the Institute. The keynote addresses which acted as the touchstones for discussion are presented here in the expectation that they will stimulate a still wider audience. We gratefully acknowledge the award of a grant from the Scientific Affairs Division of NATO to run the Institute, and also the cooperation of the University of Reading. Mrs. D. M. Powell helped in many ways with the organisation, and also retyped the entire manuscript of this book. A. Parker B. Iv. Sellwood vii FACIES, SEQUENCES AND SAND-BODIES OF THE PRINCIPAL CLASTIC DEPOSITIONAL ENVIRONMENTS T.Elliott Department of Geology University College of Swansea Singleton Park, Swansea SA 2 8PP Wales, U.K.

Advanced Petrophysics: Dispersion, interfacial phenomena Elsevier

This book explains the basic technologies, concepts, approaches, and terms used in relation to reservoir rocks. Accessible to engineers in varying roles, it provides the tools necessary for building reservoir characterization and simulation models that improve resource definition and

recovery, even in complex depositional environments. The book is enriched with numerous examples from a wide variety of applications, to help readers understand the topics. It also describes in detail the key relationships between the different rock properties and their variables. As such, it is of interest to researchers, engineers, lab technicians, and postgraduate students in the field of petroleum engineering.

**Fluid-Fluid Interactions** Springer Includes about 55,000 individual mining and mineral industry term entries with about 150,000 definitions under these terms.

**The Technology of Artificial Lift**

**Methods** Greenleaf Book Group

F. Jerry Lucia, working in America's main oil-rich state, has produced a work that goes after one of the holy grails of oil prospecting. One main target in petroleum recovery is the description of the three-dimensional distribution of petrophysical properties on the interwell scale in carbonate reservoirs. Doing so would improve performance predictions by means of fluid-flow computer simulations. Lucia's book focuses on the improvement of geological, petrophysical, and geostatistical methods, describes the basic petrophysical properties, important geology parameters, and rock fabrics from cores, and discusses their spatial distribution. A closing chapter deals with reservoir models as an input into flow

simulators.

Fundamentals of the Petrophysics of Oil and Gas Reservoirs Springer

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.

*Geophysical Signatures of Western Australian Mineral Deposits* Springer

Science & Business Media

Volume 65 of Reviews in Mineralogy and Geochemistry attempts to fill this gap and to explicitly focus on the role that co-existing fluids play in the diverse geologic environments. It brings together the previously somewhat detached literature on fluid-fluid interactions in continental, volcanic, submarine and subduction zone environments. It emphasizes that fluid mixing and unmixing are widespread processes that may occur in all geologic environments of the entire crust and upper mantle. Despite different P-T conditions, the fundamental processes are analogous in the different settings.