

Geology Of Carbonate Reservoirs The Identification Description And Characterization Of Hydrocarbon Reservoirs In Carbonate Rocks

Development Theories and Methods of Fracture-Vug Carbonate Reservoirs explores the theories and methods for successful development of a fracture-vug reservoir by presenting the developmental strategies used in the Tahe oilfield. Some of the theories and methods of developing the Tahe fracture-vug reservoirs have been inspired by two China national research projects: The 'Basic research on development of fracture-vug carbonate reservoirs' (2006-2010), and the 'Basic research on production mechanism and oil recovery enhancement of fracture-vugcarbonate reservoirs' (2011-2015), with support by the National Basic Research Program of China. These theories and methods have facilitated the successful development of the fracture-vug reservoir in the Tahe oilfield, providing effective technologies and inspirations to developing similar reservoirs everywhere. Provides information on both theoretical developments and technological innovations Applies the modern karst formation characterization and the fracture-vug hierarchical structure to geological investigations of fracture-vug carbonate reservoirs Introduces the karst facies-controlling 3D geologic modeling of fracture-vug reservoir formations Proposes the coupled-processing and equivalent multi-medium numerical simulation methods of fracture-vug reservoirs Presents development methodologies and techniques of water/gas flooding

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.

One main target in petroleum recovery is the description of of the three-dimensional distribution of petrophysical properties on the interwell scale in carbonate reservoirs, in order to improve performance predictions by means of fluid-flow computer simulations The 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.

Carbonate Reservoir [sic] Rocks

Porosity and Diagenesis in a Sequence Stratigraphic Framework

Extreme Naturally Fractured Reservoirs

field trip guidebook

Ancient Carbonate Reservoirs and Their Modern Analogs

Carbonate Petroleum Reservoirs

This thesis presents an important step towards a deeper understanding of naturally fractured carbonate reservoirs (NFCRs). It demonstrates the various kinds of discontinuities using geological evidence, mathematical kinematics model and computed tomography and uses this as a basis for proposing a new classification for NFCRs. Additionally, this study takes advantage of rock mechanics theory to illustrate how natural fractures can collapse due to fluid flow and pressure changes in the fractured media. The explanations and mathematical modeling developed in this dissertation can be used as diagnostic tools to predict fluid velocity, fluid flow, tectonic fracture collapse, pressure behavior during reservoir depleting, considering stress-sensitive and non-stress-sensitive, with nonlinear terms in the diffusivity equation applied to NFCRs. Furthermore, the book presents the description of real reservoirs with their field data as the principal goal in the mathematical description of the realistic phenomenology of NFCRs.

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

This book presents the latest advances in the field of karst hydrogeology and carbonate reservoirs. These include, but are not limited to: geomorphology of karst, flow and solute transport in karst; innovative metrology; modelling; speleogenesis and geology of carbonate reservoirs; deep reservoir exploration and production; water management and protection in karst environments; contaminant migration and chemical behavior; hydrochemistry and regional aquifer studies. EuroKarst offers a platform for professional exchanges between field practitioners and academic researchers. It is the European biennial conference on the hydrogeology of karst and carbonate reservoirs. It is organized every two years by the Universities of Neuchâtel (Switzerland), Besançon (France), and Malaga (Spain).

Petrophysical Characteristics of Carbonate Reservoirs the Red River Formation, Upper Ordovician, Williston Basin Montana and North Dakota

Fundamental Controls on Fluid Flow in Carbonates

Occurrence and Petrophysical Properties of Carbonate Reservoirs in the Rocky Mountain Region

Geomechanics, Fluid Dynamics and Well Testing, Applied to Naturally Fractured Carbonate Reservoirs

Carbonate Reservoir Characterization: A Geologic-Engineering Analysis

Carbonate Reservoir Heterogeneity

This textbook provides an overview of the origin and preservation of carbonate sedimentary rocks. The focus is on limestones and dolostones and the sediments from which they are derived. The approach is general and universal and draws heavily on fundamental discoveries, arresting interpretations, and keystone syntheses that have been developed over the last five decades. The book is designed as a teaching tool for upper level undergraduate classes, a fundamental reference for graduate and research students, and a scholarly source of information for practicing professionals whose expertise lies outside this specialty. The approach is rigorous, with every chapter being designed as a separate lecture on a specific topic that is encased within a larger scheme. The text is profusely illustrated with all colour diagrams and images of rocks, subsurface cores, thin sections, modern sediments, and underwater seascapes. Additional resources for this book can be found at: www.wiley.com/go/james/carbonaterocks

Shallow-marine carbonate sequences commonly undergo exposure to meteoric waters. These waters are chemically aggressive toward sedimentary carbonate minerals, capable of rapidly dissolving grains and generating secondary porosity. The carbonate derived from dissolution can precipitate as cement, either nearby or hydrologically downstream, decreasing porosity. Thus the potential for restructuring of original depositional porosity is very high in the meteoric diagenetic environment. Chemical signatures of meteoric pore waters and meteoric carbonate cements are distinct and reflect kinetics of the CaCO₃-H₂O-CO₂ system, climatic effects, and hydrologic setting. The meteoric diagenetic environment is subdivided into vadose and phreatic diagenetic zones. Caliches/calcretes are distinctive diagenetic profiles of uppermost vadose zones in semi-arid climates. Porosity development in vadose diagenetic zones is to a large degree a function of relative sea level, which controls the occurrence of localized floating freshwater lenses (during highstands) versus regional meteoric water systems (during lowstands). Detailed examples presented include Quintana Roo (Mexico) strandplains and Oaks Field (North Louisian Jurassic), both highstand prograding shoreline systems, and Great Bahama Bank and Barbados (lowstand platform-wide aquifer systems). Geochemical trends in calcite cements and porosity development patterns characteristic of regional meteoric aquifer systems are illustrated from Mississippian Lake Valley Formation grainstones (southwest New Mexico). Karst processes and porosity styles are described in order that paleokarst features in reservoirs can be recognized and/or predicted. Detailed evaluations of paleokarsted reservoirs include Yates and Ellenburger fields (Permian and Ordovician of West Texas, respectively) and Rospo Mare Field (Cretaceous), Adriatic offshore, Italy. Lastly, the validity and significance of dolomitization associated with meteoric and especially mixed meteoric-marine waters (Dorag model) is evaluated and found to be lacking.

This book provides a comprehensive overview of the parameters and factors that cause heterogeneity in carbonate reservoirs, and examines how they interact with one another. It explores the various scales of heterogeneity, how they are caused, and how they can be minimized, as well as how the scales affect each other, providing practical examples in each chapter. The book concludes by discussing the effect of heterogeneity on petrophysical evaluations. As reducing heterogeneity is the only way to obtain accurate carbonate reservoir characteristics at the regional scale, the book offers an important reference guide for all geologists, engineers, and modelers working with subsurface data.

Analysis, Modelling and Prediction

Notes for SEPM Core Workshop No. 1, June 8 and June 12, 1980, Denver, Colorado

Anatomy of a Giant Carbonate Reservoir

Structural and diagenetic controls on reservoir quality in tight siliciclastic and carbonate rocks

Chapter 8. Meteoric Diagenetic Environment

AAPG Memoir 33

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 geologic 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 in highly anisotropic reservoirs Provides real-life illustrations through case histories and field and laboratory data

The accurate prediction of reservoir quality is, and will continue to be, a key challenge for hydrocarbon exploration and development. This volume compiles worldwide case studies covering some predictive aspects of both siliciclastic and carbonate reservoir characteristics. The e variability due to diagenetic effects in sandstones and carbonates, rather than on sedimentological effects, i.e., the presence or absence of a given reservoir.

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 i

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

and discusses their spatial distribution. A closing chapter deals with reservoir models as an input into flow simulators.

Origin of Carbonate Sedimentary Rocks

AAPG Memoir 91

Advances in Carbonate Exploration and Reservoir Analysis

Likely Elucidations and Way Forward

Implications for Improved Recovery

Geology of Carbonate Reservoirs

The case history approach has an impressive record of success in a variety of disciplines. Collections of case histories, casebooks, are now widely used in all sorts of specialties other than in their familiar application to law and medicine. The case method had its formal beginning at Harvard in 1871 when Christopher Lagdell developed it as a means of teaching. It was so successful in teaching law that it was soon adopted in medical education, and the collection of cases provided the raw material for research on various diseases. Subsequently, the case history approach spread to such varied fields as business, psychology, management, and economics, and there are over 100 books in print that use this approach. The idea for a series of Casebooks in Earth Sciences grew from my experience in organizing and editing a collection of examples of one variety of sedimentary deposits. The project began as an effort to bring some order to a large number of descriptions of these deposits that were so varied in presentation and terminology that even specialists found them difficult to compare and analyze. Thus, from the beginning, it was evident that something more than a simple collection of papers was needed. Accordingly, the nearly fifty contributors worked together with George de Vries Klein and me to establish a standard format for presenting the case histories.

Reservoir quality is studied using a wide range of similar techniques in both sandstones and carbonates. Sandstone and carbonate reservoir quality both benefit from the study of modern analogues and experiments, but modelling approaches are currently quite different for these two types of reservoirs. There are many common controls on sandstone and carbonate reservoir quality, but also distinct differences due primarily to mineralogy. Numerous controversies remain including the question of oil inhibition, the key control on pressure solution and geochemical flux of material to or from reservoirs. This collection of papers contains case-study-based examples of sandstone and carbonate reservoir quality prediction as well as modern analogue, outcrop analogue, modelling and advanced analytical approaches.

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 partitioning, 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.

Reservoir Quality Prediction in Sandstones and Carbonates

Advances in the Hydrogeology of Karst and Carbonate Reservoirs

Lower Cretaceous Carbonate Reservoirs, Northeastern Gulf of Mexico

EuroKarst 2016, Neuchâtel

The Identification, Description and Characterization of Hydrocarbon Reservoirs in Carbonate Rocks

Geological Controls on Reservoir Development in a Leonardian (Lower Permian) Carbonate Platform Reservoir, Monahans Field, West Texas

Hardcover plus DVD

This volume highlights key challenges for fluid-flow prediction in carbonate reservoirs, the approaches currently employed to address these challenges and developments in fundamental science and technology. The papers span methods and case studies that highlight workflows and emerging technologies in the fields of geology, geophysics, petrophysics, reservoir modelling and computer science. Topics include: detailed pore-scale studies that explore fundamental processes and applications of imaging and flow modelling at the pore scale; case studies of diagenetic processes with complementary perspectives from reactive transport modelling; novel methods for rock typing; petrophysical studies that investigate the impact of diagenesis and fault-rock properties on acoustic signatures; mechanical modelling and seismic imaging of faults in carbonate rocks; modelling geological influences on seismic anisotropy; novel approaches to geological modelling; methods to represent key geological details in reservoir simulations and advances in computer visualization, analytics and interactions for geoscience and engineering.

This book presents selected papers from the EuroKarst 2018 conference, which highlighted the latest advances in the field of Karst Hydrogeology and Carbonate Reservoirs. The event attracted more than 180 participants. From among their contributions, the papers were selected and subsequently reviewed by the scientific committee to ensure the highest possible quality.

Fractured carbonate reservoirs in central-northeast Tunisia

Eurokarst 2018, Besançon

Carbonate Seismology

An Integrated Approach

A Core Workshop

Carbonate Reservoirs

"This book was written for students, new professionals in oil companies, and for anyone with an interest in reservoir geology. It explains the background to production geology in the context of oil field subsurface operations. It also gives practical guidelines as to how a production geologist can analyze the reservoir geology and fluid flow characteristics of an oil field with the aim of improving hydrocarbon recovery. Advice is given on how to search for the remaining oil volumes in a producing field, where these pockets are typically found, and then how to plan wells to target these volumes."--Publisher's description.

Carbonate Reservoirs: Porosity, Evolution and Diagenesis in a Sequence Stratigraphic Framework

Carbonate reservoirs contain an increasingly important percentage of the world's hydrocarbon reserves. This volume presents key recent advances in carbonate exploration and reservoir analysis.

Carbonate Depositional Environments

Reservoir Quality of Clastic and Carbonate Rocks

Carbonate Reservoir Characterization

Seismic Characterization of Carbonate Platforms and Reservoirs

Petro-physics and Rock Physics of Carbonate Reservoirs

Development Theories and Methods of Fracture-Vug Carbonate Reservoirs

An accessible resource, covering the fundamentals of carbonate reservoir engineering Includes discussions on how, where and why carbonate areformed, plus reviews of basic sedimentological and stratigraphicprinciples to explain carbonate platform characteristics andstratigraphic relationships Offers a new, genetic classification of carbonate porosity thatis especially useful in predicting spatial distribution of porenetworks. Includes a solution manual

A critical component of reservoir management is the accurate characterization of the hydrocarbon asset, called reservoir characterization. The topic of this course is the process of sequence-stratigraphic interpretation and characterization of carbonate reservoirs. The authors believe that the two disciplines are so intimately related that the sequence framework should be considered a critical piece of the integrated puzzle.

Although carbonates make up only 20% of the sedimentary rock record, they account for more than 50% of the world's proven oil reserves. Carbonates differ from siliciclastics in generation, geomorphology, and diagenesis, all of which modify the mineralogy, porosity, and permeability so important to reservoir quality and 3-D seismic response. The first eight chapters establish the geologic framework and consist of state-of-the-art review papers written by recognized experts in carbonate generation, rock properties, sequence stratigraphy, seismic stratigraphy, and structural deformation. The last 10 chapters illustrate the seismic expression of carbonate terranes through carefully chosen case studies drawn from the United States, Venezuela, Norway, China, Saudi Arabia, Italy, and the Bahamas, augmented by two careful studies of seismic signal-to-noise problems specific to carbonates. A recurring theme in each of these case studies is the importance of integrating seismic and petrophysical control with geologic models to better predict carbonate facies quality and distribution. This book is destined to become a well-worn reference volume that sits easily within reach of every geologist, geophysicist, and engineer involved in the exploration or exploitation of carbonate reservoirs.

Lecture Series Sponsored by NOGS Continuing Education Committee, January 23, 1975

Depositional Models for Carbonate Reservoirs

Oil Field Production Geology

AAPG Memoir 81

Rocky Mountain Carbonate Reservoirs

Sequence Stratigraphy and Characterization of Carbonate Reservoirs

The 2nd Edition of Carbonate Reservoirs aims to educate graduate students and industry professionals on the complexities of porosity evolution in carbonate reservoirs. In the intervening 12 years since the first edition, there have been numerous studies of value published that need to be recognized and incorporated in the topics discussed. A chapter on the impact of global tectonics and biological evolution on the carbonate system has been added to emphasize the effects of global earth processes and the changing nature of life on earth through Phanerozoic time on all aspects of the carbonate system. The centerpiece of this chapter—and easily the most important synthesis of carbonate concepts developed since the 2001 edition—is the discussion of the CATT hypothesis, an integrated global database bringing together stratigraphy, tectonics, global climate, oceanic geochemistry, carbonate platform characteristics, and biologic evolution in a common time framework. Another new chapter concerns naturally fractured carbonates, a subject of increasing importance, given recent technological developments in 3D seismic, reservoir modeling, and reservoir production techniques. Detailed porosity classifications schemes for easy comparison Overview of the carbonate sedimentologic system Case studies to blend theory and practice

Modern seismic data have become an essential toolkit for studying carbonate platforms and reservoirs in impressive detail. Whilst driven primarily by oil and gas exploration and development, data sharing and collaboration are delivering fundamental geological knowledge on carbonate systems, revealing platform geomorphologies and how their evolution on millennial time scales, as well as kilometric length scales, was forced by long-term eustatic, oceanographic or tectonic factors. Quantitative interrogation of modern seismic attributes in carbonate reservoirs permits flow units and barriers arising from depositional and diagenetic processes to be imaged and extrapolated between wells. This volume reviews the variety of carbonate platform and reservoir characteristics that can be interpreted from modern seismic data, illustrating the benefits of creative interaction between geophysical and carbonate geological experts at all stages of a seismic campaign. Papers cover carbonate exploration, including the uniquely challenging South Atlantic pre-salt reservoirs, seismic modelling of carbonates, and seismic indicators of fluid flow and diagenesis.

Controls on Reservoir Heterogeneity in Permian Shallow-water-platform Carbonate Reservoirs, Permian Basin

Seismic Imaging of Carbonate Reservoirs and Systems

Geologic Analysis of Naturally Fractured Reservoirs

Current Workflows to Emerging Technologies

Fullerton Clear Fork (Lower Permian) Field, Permian Basin, Texas, AAPG Studies in Geology 63

Carbonate Reservoirs: Porosity, Evolution and Diagenesis in a Sequence Stratigraphic Framework