Sedimentary Basins And Petroleum Geology Of The Middle East

Basin Analysis is an advanced undergraduate andpostgraduate text aimed at understanding sedimentary basins asgeodynamic entities. The rationale of the book is that knowledge ofthe basic principles of the thermo-mechanical behaviour of thelithosphere, the dynamics of the mantle, and the functioning ofsediment routing systems provides a sound background for studyingsedimentary basins, and is a pre-requisite for the exploitation ofresources contained in their sedimentary rocks. The third editionincorporates new developments in the burgeoning field of basinanalysis while retaining the successful structure and overallphilosophy of the first two editions. The text is divided into 4 parts that establish the geodynamicalenvironment for sedimentary basins and the physical state of thelithosphere, followed by a coverage of the mechanics of basinformation, an integrated analysis of the controls on the basin-filland its burial and thermal history, and concludes with anapplication of basin analysis principles in petroleum playassessment, including a discussion of unconventional hydrocarbonplays. The text is richly supplemented by Appendices providingmathematical derivations of a wide range of processes affecting theformation of basins and their sedimentary fills. Many of theseAppendices include practical exercises that give the readerhands-on experience of quantitative solutions to important basinanalysis processes. Now in full colour and a larger format, this third edition is acomprehensive update and expansion of the previous editions, and represents a rigorous yet accessible guide to problemsolving in this most integrative of geoscientific disciplines. Additional resources for this book can be found at: ahref="http://www.wiley.com/go/allen/basinanalysis"www.wiley.com/go/allen/basinanalysis/a.

This is a how-to encyclopedia of prospecting for oil and gas. The book, an addition to the Handbook set of the Treatise of Petroleum Geology, focuses on procedures and proven petroleum exploration techniques that are critical for generating viable prospects. The twenty-one chapters deal with exploration philosophy, the concept and critical elements of traps in a petroleum system, evaluating the elements of a petroleum province, and methods for predicting reservoir occurrence, quality, and performance.

Petroleum Geology

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This book is intended to give an introduction to sedimentology and petroleum geology at undergraduate level. These two subjects have been treated together because of the close links between sedimen tology as an academic dicipline, petroleum geology, which is the application of sedimentology, and a number of other aspects of petroleum exploration and production. The oil industry ist by far the most important employer of sedimentologists and the lively interaction that takes place between the academic community and the research laboratories and exploration departments of the oil industry has been very fruitful for both parties. Our knowledge of sedimentary basins now depends to a very large extent on data obtained by commercial petroleum exploration. Studies of actual rocks in outcrops, particularly if they are extensive, will always be important for sedimentologists, but subsurface data like seismic sections and well logs provide us with in much information on the three-dimensional distribution of

facies that we could not otherwise obtain. Subsurface techniques are certainly important for pe troleum geologists, but also other sedimentologists should be able to use subsurface data. I have therefore included elementary intro ductions to the use of well logs and seismic methods in this book, with fundamentals of external controls on sedimentation such as basin subsidence and sea level changes. I have tried to present the state of knowledge at this level without referring to the original research papers except when specific data are quoted or used in illustrations.

Petroleum Geology of Libya, Second Edition, systematically reviews the exploration history, plate tectonics, structural evolution, stratigraphy, geochemistry and petroleum systems of Libya, and includes valuable new chapters on oil and gas fields, production, and reserves. Since the previous edition, published in 2002, there have been numerous developments in Libya, including the lifting of sanctions, a new licensing system, with licensing rounds in 2004, 2005, 2006, and 2007, many new exploratory wells, discoveries and field developments, and a change of regime. A large amount of new data has been published on the geology of Libya in the past fourteen years, but it is widely scattered through the literature. Much of the older data has been superseded, and several of the key publications, especially those published in Libya, are difficult to access. This second edition provides an updated source of reference which incorporates much new information, particularly on petroleum systems, reserves, oil and gas fields, play fairways, and remaining potential. It presents the results of recent research and a detailed description of Libyan offshore geology. The book includes an extensive and comprehensive bibliography. Presents over 180 full colour illustrations including maps, diagrams and charts, illustrating the key concepts in a clear and concise manner Authored by two recognized world authorities on geology in Libya, with over 40 years' experience in Libya between them Provides an expanded and updated version of the bestselling previous edition, nicknamed the Explorationist's Bible Lays the foundation for the post-revolution exploration age in Libya

This book provides a comprehensive introduction to techniques for quantitative subsidence analysis and visualization with example applications. Subsidence analysis is an essential step to understand basin evolution through geologic time and space in the study of sediments and sedimentary basins. Quantifying techniques have been developed and applied in many basin research projects to evaluate total, tectonic and thermal subsidence. They are also a pre-requisite for basin evolution modelling. Recent studies have applied visualization techniques to understand regional subsidence contexts and trends, which confirmed that three-dimensional visualization of the basin subsidence is highly helpful to gain insight into basin evolution. In this book, we show how geoscience and computer science can be effectively combined in advanced basin analysis, especially in terms of basin subsidence. Each type of subsidence analysis is introduced with example applications. In particular we present a study of the Vienna basin using BasinVis, a MATLAB-based program for analyzing and visualizing basin subsidence. Given its breadth of coverage, this book will benefit students in undergraduate and postgraduate courses and provide helpful information for research projects and industry applications.

This Third Edition of Elements of Petroleum Geology is completely updated and

revised to reflect the vast changes in the field since publication of the Second Edition. This book is a usefulprimer for geophysicists, geologists, and petroleum engineers in the oil industry who wish to expand their knowledge beyond their specialized area. It is also an excellent introductory text for a university course in petroleum geoscience. Elements of Petroleum Geology begins with an account of the physical and chemical properties of petroleum, reviewing methods of petroleum exploration and production. These methods include drilling, geophysical exploration techniques, wireline logging, and subsurface geological mapping. After describing the temperatures and pressures of the subsurface environment and the hydrodynamics of connate fluids, Selley examines the generation and migration of petroleum, reservoir rocks and trapping mechanisms, and the habit of petroleum in sedimentary basins. The book contains an account of the composition and formation of tar sands and oil shales, and concludes with a brief review of prospect risk analysis, reserve estimation, and other economic topics. Updates the Second Edition completely Reviews the concepts and methodology of petroleum exploration and production Written by a preeminent petroleum geologist and sedimentologist with decades of petroleum exploration in remote corners of the world Contains information pertinent to geophysicists, geologists, and petroleum reservoir engineers Updated statistics throughout Additional figures to illustrate key points and new developments New information on drilling activity and production methods including crude oil, directional drilling, thermal techniques, and gas plays Added coverage of 3D seismic interpretation New section on pressure compartments New section on hydrocarbon adsorption and absorption in source rocks Coverage of The Orinoco Heavy Oil Belt of Venezuela Updated chapter on unconventional petroleum

The Sedimentary Basins of the United States and Canada, Second Edition, focuses on the large, regional, sedimentary accumulations in Canada and the United States. Each chapter provides a succinct summary of the tectonic setting and structural and paleogeographic evolution of the basin it covers, with details on structure and stratigraphy. The book features four new chapters that cover the sedimentary basins of Alaska and the Canadian Arctic. In addition to sedimentary geologists, this updated reference is relevant for basin analysis, regional geology, stratigraphy, and for those working in the hydrocarbon exploration industry. Features updates to existing chapters, along with new chapters on sedimentary basins in Alaska and Arctic Canada Includes nearly 300 detailed, full-color paleogeographic maps Written for general geological audiences and individuals working in the resources sector, particularly those in the fossil fuel industry

Investigating the complex interplay between tectonics and sedimentation is a key endeavor in modern earth science. Many of the world's leading researchers in this field have been brought together in this volume to provide concise overviews of the current state of the subject. The plate tectonic revolution of the 1960's provided the framework for detailed models on the structure of orogens and basins, summarized in a 1995 textbook edited by Busby and Ingersoll. Tectonics

of Sedimentary Basins: Recent Advances focuses on key topics or areas where the greatest strides forward have been made, while also providing on-line access to the comprehensive 1995 book. Breakthroughs in new techniques are described in Section 1, including detrital zircon geochronology, cosmogenic nuclide dating, magnetostratigraphy, 3-D seismic, and basin modelling. Section 2 presents the new models for rift, post-rift, transtensional and strike slip basin settings. Section 3 addresses the latest ideas in convergent margin tectonics, including the sedimentary record of subduction intiation and subduction, flat-slab subduction, and arc-continent collision; it then moves inboard to forearc basins and intra-arc basins, and ends with a series of papers formed under compessional strain regimes, as well as post-orogenic intramontane basins. Section 4 examines the origin of plate interior basins, and the sedimentary record of supercontinent formation. This book is required reading for any advanced student or professional interested in sedimentology, plate tectonics, or petroleum geoscience. Additional resources for this book can be found at: www.wiley.com/go/busby/sedimentarybasins.

In this work, the reader will find the basic concepts and vocabulary of sedimentary geology, along with a presentation of the new ideas that are in current use in petroleum exploration. This abundantly illustrated book will serve as an excellent educational tool and remain a valuable resource and handy reference work in any petroleum geology library.Contents: 1. Basics of dynamic geology. 2. Continental and oceanic basins. 3. Sedimentary driving mechanisms and environments. 4. Time evolution: Sedimentary sequences, stratigraphy. 5. From sediments to sedimentary basin rocks and mountain chains. 6. Petroleum systems. IndexState of Strain. 2. State of Stress. 3. Thermodynamics of Continuous Media. II. Mechanism of Material Strain. 4. Linear Elasticity. General Theory. 5. Plane Theory of Elasticity. 6. Behaviour of a Material Containing Cavities. 7. Thermodynamics of Saturated Porous Media. 8. Infinitesimal Thermoporoelasticity. 9. The Triaxial Test and the Measurement of Thermoporoelastic Properties. 10. Thermoporoelastoplasticity. General Theory and Application. III. Mechanisms of Material Cohesion Loss. 11. Fissuring. 12. Introduction to Damage Theory. 13. Appearance of Shearing Bands in Geomaterials.

The collection of papers in this volume is a direct result of the Society of Economic Paleontologists and Mineralogists Research Symposium on "Thermal History of Sedimentary Basins: Methods and Case Histories" held as part of the American Association of Petroleum Geologists Annual Convention in New Orleans in March 1985. The original goal of the sym posium was to provide a forum where specialists from a variety of dis ciplines could present their views of methods that can be used to study the thermal history of a sedimentary basin or an important portion of a basin. An explicit part of that goal was to illustrate each method by presentation of a case history application. The original goal is addressed by the chapters in this volume, each of which emphasizes a

somewhat different approach and gives field data in one way or another to illustrate the practical useful ness ofthe method. The significance of our relative ignorance of the thermal conductivities of sedimentary rocks, especially shales, in efforts to understand or model sedimentary basin thermal histories and maturation levels is a major thrust of the chapter by Blackwell and Steele. Creaney focuses on variations in kerogen composition in source rocks of different depositional environments and the degree to which these chem- . ically distinct kerogens respond differently to progressive burial heating.

Expert petroleum geologists David Roberts and Albert Bally bring you Regional Geology and Tectonics: Principles of Geologic Analysis, volume one in a three-volume series covering Phanerozoic regional geology and tectonics. It has been written to provide you with a detailed overview of geologic rift systems, passive margins, and cratonic basins, it features the basic principles necessary to grasping the conceptual approaches to hydrocarbon exploration in a broad range of geological settings globally. Named a 2013 Outstanding Academic Title by the American Library Association's Choice publication A "how-to" regional geology primer that provides a detailed overview of tectonics, rift systems, passive margins, and cratonic basins The principles of regional geological analysis and the main geological and geophysical tools are discussed in detail. The tectonics of the world are captured and identified in detail through a series of unique geographic maps, allowing quick access to exact tectonic locations. Serves as the ideal introductory overview and complementary reference to the core concepts of regional geology and tectonics offered in volumes two and three in the series.

Petroleum is not as easy to find as it used to be. In order to locate and develop reserves efficiently, it's vital that geologists and geophysicists understand the geological processes that affect a reservoir rock and the oil that is trapped within it. This book is about how and to what extent, these processes may be understood. The theme of the book is the characterization of fluids in sedimentary basins, understanding their interaction with each other and with rocks, and the application of this information to finding, developing and producing oil and gas. The first part of the book describes the techniques, and the second part relates real-life case histories covering a wide range of applications. Petroleum geology, particularly exploration, involves making the best of incomplete results. It is essentially an optimistic exercise. This book will remove some of the guesswork. Brings together the most important geochemical methods in a single volume. Authored by two well-respected researchers in the oil industry. Real-life, international case histories.

The Black Sea remains one of the largest underexplored rift basins in the world. Future success is dependent on a better understanding of a number of geological uncertainties. These include reservoir and source rock presence and quality, and the timing of migration of hydrocarbons relative to trap formation. An appreciation of the geological history of the Black Sea basins and the surrounding orogens is therefore key. The timing of basin formation, uplift of the margins, and of facies distribution remain issues for robust debate. This Special Publication presents the results of 15 studies that relate to the tectono-stratigraphy and petroleum geology of the Black Sea. The methodologies of these studies encompass crustal structure, geodynamic

evolution, stratigraphy and its regional correlation, petroleum systems, source to sink, hydrocarbon habitat and play concepts, and reviews of past exploration. They provide insight into the many ongoing controversies concerning Black Sea regional geology and provide a better understanding of the geological risks that must be considered for future hydrocarbon exploration.

This monograph presents a unique combination of structural and tectonic modelling with applied petroleum geological problems. Focussing on the Norwegian Continental Shelf and neighbouring areas, it includes discussion covering all scales - from development of sedimentary basins, to formation of fractures and joints on a microscale - and from exploration, to the exploitation of hydrocarbons. The book's coverage of structural and tectonic modelling, petroleum geology applications, and the treatment of the Norwegian Continental Shelf should make this book an invaluable resource book for advanced students of structural and tectonic modelling, teachers, and researchers; as well as for geologists and geophysicists in the petroleum industry.

The wealth of petroleum has made the Middle East one of the most actively explored regions of the world. The volume of geological, geophysical and geochemical data collected by the petroleum industry in recent decades is enormous. The Middle East may be a unique region in the world where the volume of subsurface data and information exceeds that based on surface outcrop. This book reviews the tectonic and geological history of the Middle East and the regional hydrocarbon potential on a country by country basis in the context of current ideas developed through seismic and sequence stratigraphy and incorporating the ideas of global sea level change. Subsurface data have been used as much as possible to amplify the descriptions. The paleogeographic approach provides a means to view the area as a whole. While the country by country approach inevitably leads to some repetition, it enhances the value of the volume as a teaching tool and underlines some of the changing lithologies within formations carrying the same name.

In this information-packed volume, the authors present mathematical models and analyses for evaluating, assessing, and describing the petroleum geology of the oil-rich South Caspian Sea Basin, including eastern Azerbaijan and western Turkmenistan. Their mathematical models include descriptions of the development and structure of the surrounding geological systems and traps. Details the petrophysical properties and interrelationship with reservoir and source rocks Describes how new technology has made it possible to profitably produce off previously useless wells A valuable resource for exploration companies in the area of the South Caspian Basin

This comprehensive textbook presents an overview of petroleum geoscience for geologists active in the petroleum industry, while also offering a useful guide for students interested in environmental geology, engineering geology and other aspects of sedimentary geology. In this second edition, new chapters have been added and others expanded, covering geophysical methods in general and electromagnetic exploration methods in particular, as well as reservoir modeling and production, unconventional resources and practical petroleum exploration.

Professor Li’s World Atlas of Oil and Gas Basins is a fresh and comprehensive treatise of the distribution of the world’s hydrocarbon reserves. The Atlas highlights the geographical, sedimentary and geological features of the basins,

using a combination of maps and stratigraphic diagrams to depict the history, prospectivity and commercial production capacity of the reserves on a continental and country-by-country basis. The Atlas is an essential reference source for petroleum geologists and reservoir engineers working in hydrocarbon exploration and production. It is also a valuable and original teaching aid for university graduate and postgraduate courses. The Atlas provides a welcome addition to the global database of the world's energy resources and is therefore an indispensable source of information for the formulation of future strategies to exploit oil and gas reserves. Written by one of China's foremost petroleum geologists, the Atlas provides a rare analysis of the industry from the perspective of the country whose demand for oil and gas is set to become the largest in the next few decades. It is an important and vital scholarly work.

A comprehensive and richly illustrated overview of the Gulf of Mexico Basin, including its reservoirs, source rocks, tectonics and evolution.

This book has been prepared by the collaborative effort of two somewhat separate technical groups: the researchers at the Institute for Petroleum and Organic Geochemistry, Forschungszentrum Jii lich (KFA), and the technical staff of Integrated Exploration Systems (IES). One of us, Donald R. Baker, from Rice University, Houston, has spent so much time at KFA as a guest scientist and researcher that it is most appropriate for him to contribute to the book. During its more than 20-year history the KFA group has made numerous and significant contributions to the understanding of petroleum evolution. The KFA researchers have emphasized both the field and laboratory approaches to such important problems as source rock recognition and evaluation, oil and gas generation, maturation of organic matter, expulsion and migration of hydrocarbons, and crude oil composition and alteration. IES Jiilich has been a leader in the development and application of numerical simulation (basin modeling) procedures. The cooperation between the two groups has resulted in a very fruitful synergy effect both in the development of modeling software and in its application. The purpose of the present volume developed out of the 1994 publication by the American Association of Petroleum Geologists of a collection of individually authored papers entitled The Petroleum System - From Source to Trap, edited by L. B. Magoon and W. G. Dow.

Over the past five years there have been many advances in the field of basin analysis. Developments such as the publication of new stratigraphic codes; new research in fission-track dating; evolution of thought regarding the importance of tectonic versus eustatic controls of regional and global cycles; and refinements of geophysically-based, basin-subsidence models have necessitated the publication of a second edition of Principles of Sedimentary Basin Analysis. Like the first edition, this book emphasizes the stratigraphic evidence which geologists can actually see in outcrops, well records, and core samples and can gather using geophysical techniques. Principles of Sedimentary Basin Analysis is both an excellent text for students and a practical handbook for professional geologists.

During the past 10 years, the Oil industry in India has seen a tremendous rise in exploration activity with several major E&P companies generating vast amount of new geological and geophysical data. The availability of such integrated data sets (gravity, magnetic, seismic, drilled wells), especially in the deep offshore basins, has led the authors to revisit earlier concepts and models in order to redefine the tectonic framework of major offshore basins along the Indian continental margins. The book covers the stratigraphic evolution, play types and the classification of major offshore basins both in shallow and deepwater environments. Incorporation of latest dataset (specially the seismic, gravity and magnetic) Analogy of global offshore basins with India Sedimentation and depositional history of Bengal fan and Indus fan Redefinition of major tectonic framework of the margins Exceleent high quality graphics that include: seismic sections, gravity-magnetic maps, conceptual geological models and new revised tectonic elements

Since the search for hydrocarbon resources in the Arctic started in the 1930's the exploration activity has expanded into many of the Arctic regions, and several of the Arctic sedimentary basins have proven to be important sources of hydrocarbon. Nevertheless, the Arctic continental margins and adjacent onshore areas are still largely unexplored in the context of petroleum, and are therefore considered to be one of the few regions in the world where significant undiscovered sources of hydrocarbon may exist. The aim of the book is to give an updated overview of the geology of the Arctic sedimentary basins and their petroleum potential. Although the different basins vary significantly as regards sedimentary fill and tectonic evolution, many of the basins share some of the characteristics needed to become prolific oil and gas provinces. The book contains 45 extensively illustrated articles. It starts with papers on the Mesozoic source rocks, and oceanic natural gas clatrates in the Arctic, respectively. Then follow articles on the regional and petroleum geology of the main regions; Greenland, North American Arctic, Soviet Arctic and the Barents Sea. Particular emphasis is placed on the Barents Sea. The two last chapters comprise articles on salt dynamics and methods. The book closes with a paper on international law in the Arctic. This volume will be of interest to both students and professional earth scientists/petroleum explorationists working in the northern latitudes. It will allow the readers to stay abreast of the development in this climatic region of the world.

Fluvial deposits represent the preserved record of one of the major nonmarine environ ments. They accumulate in large and small intermontane valleys, in the broad valleys of trunk rivers, in the wedges of alluvial fans flanking areas of uplift, in the outwash plains fronting melting glaciers, and in coastal plains. The nature of alluvial assemblages - their lithofacies composition, vertical stratigraphic record, and architecture - reflect an inter play of many processes, from the wandering of individual channels across a floodplain, to the long-term effects of uplift and subsidence. Fluvial deposits are a sensitive indicator of tectonic

processes, and also carry subtle signatures of the climate at the time of deposition. They are the hosts for many petroleum and mineral deposits. This book is about all these subjects. The first part of the book, following a historical introduction, constructs the strati graphic framework of fluvial deposits, step by step, starting with lithofacies, combining these into architectural elements and other facies associations, and then showing how these, in turn, combine to represent distinctive fluvial styles. Next, the discussion turns to problems of correlation and the building of large-scale stratigraphic frameworks. These basin-scale constructions form the basis for a discussion of causes and processes, including autogenic processes of channel shifting and cyclicity, and the larger questions of allogenic (tectonic, eustatic, and climatic) sedimentary controls and the development of our ideas about nonmarine sequence stratigraphy.

This book provides a comprehensive overview of the geology and the petroleum potential of the Arctic. Nine papers offer a circum-Arctic perspective on the Phanerozoic tectonic and palaeogeographic evolution, the currently recognized sedimentary basins, the gravity and magnetic fields and, perhaps most importantly, the petroleum resources and yet-to-find potential of the basins. The remaining 41 papers provide data-rich, geological and geophysical analyses and individual oil and gas assessments of specific basins throughout the Arctic. These detailed and well illustrated studies cover the continental areas of Laurentia, Baltica and Siberia and the Arctic Ocean. Of special interest are the 13 papers providing new data and interpretations on the extensive, little known, but promising, basins of Russia.