

Understanding Mineral Deposits

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Ore Deposit Geology John Wiley & Sons

This is the completely revised edition of a book which was published in 1978 and, such was its popularity, was sold out within two years. It was described as "An excellent compilation and condensation of a vast field of literature and experience in economic geology. Clear illustrations, charts and tables punctuate the text material very nicely... Valuable for all economic geologists and resource developers." (Choice). The material is illustrated by 215 text figures and 76 tables, and is presented in two parts. The first part covers the geological background of the genesis of mineral deposits as a clue to new discoveries, and the methods of geological, geochemical and geophysical prospecting. The second part concerns sampling, documentation and computation of ore reserves and economic assessment of mineral deposits. This new edition has been very extensively revised and brought up to date. This holds true particularly for the chapters on geochemical and geophysical methods, the use of photo-geology and satellite imagery, oil and gas prospecting, exploration of underwater minerals, the application of the principles of global tectonics in prospecting for deposits, and the evaluation of reserves. These new or thoroughly revised chapters comprise almost half of the entire text.

Essentials of Mineral Exploration and Evaluation Elsevier

The Economic Geology of Iran is a complete and comprehensive book about mineral deposits, energy and water resources of Iran. Dr. Mansour Ghorbani has travelled to each of the huge variety of locations that feature the resources covered, personally verifying the details of them all. The book starts by describing the geography and physiography of Iran as well as its various climatic regions and the diverse corresponding vegetation. Then the book gives an excellent overview of the geology of the country, followed by the history of mining in Iran up to now. The author describes also the metallogenic and mineralization phases of Iran, its mineral zones and belts, and, more generally, the distribution of mineral deposits in the country. Dr. Ghorbani gives us also an analysis of the position of Iran in terms of global mineral resources, as well as the role that the country's mineral, energy and natural resources play in its overall economy. The book finishes with also provides a complete list of Iranian mineral deposits. This book is a perfect source of information for all students and researchers in the field of geo-science at the university level but also for mining and oil companies that would like to work, invest and get involved in such businesses in Iran.

Prospecting and Exploration of Mineral Deposits Springer

This volume presents an exhaustive overview of major orebodies and mineral deposits of North Africa. It is intended both for academic researchers and especially for exploration geologists interested in mineral exploration in the northern part of the African continent. Recent changes in the mining laws of most countries in this region have encouraged international mining companies to invest in local mineral industries. Accordingly, this volume will be very useful for these professionals, as well as for researchers in the field of economic geology.

Mineral Deposits of North Africa Elsevier

Mapping closely to how ore deposit geology is now taught, this textbook systematically describes and illustrates the major ore deposit types, linking this to their settings in the crust and the geological factors behind their formation. Written for advanced undergraduate and graduate students with a basic background in the geosciences, it provides a balance of practical information and coverage of the relevant geological sciences, including petrological, geochemical, hydrological and tectonic processes. Important theory is summarized without unnecessary detail and integrated with students' learning in other topics, including magmatic processes and sedimentary geology, enabling students to make links across the geosciences. Students are supported by further reading, a comprehensive glossary, and problems and review questions that test the application of theoretical approaches and encourage students to use what they have learnt. A website includes visual resources and combines with the book to provide students and instructors with a complete learning package.

The Working of Mineral Deposits Elsevier

Advanced Algorithms for Mineral and Hydrocarbon Exploration Using Synthetic Aperture Radar is a research- and practically-based reference that bridges the gap between the remote sensing industry and the mineral and hydrocarbon exploration industry. In this context, the book explains how to commercialize the applications of synthetic aperture radar and quantum interferometry synthetic aperture radar (QInSAR) for mineral and hydrocarbon exploration. This multidisciplinary reference is useful for oil and gas companies, the mining industry, geoscientists, and coastal and petroleum engineers. Presents both theoretical and practical applications of various types of remote sensing for hydrocarbon and mineral exploration Covers specific problems for exploration professionals and provides applications for solving each problem Includes more than 100 images and figures to help explain the concepts and applications described in the book

Economic Mineral Deposits Elsevier

Introduction to Ore-Forming Processes is the first senior undergraduate - postgraduate textbook to focus specifically on the multiplicity of geological processes that result in the formation of mineral deposits. Opens with an overview of magmatic ore-forming processes Moves systematically through hydrothermal and sedimentary metallogenic environments, covering as it does the entire gamut of mineral deposit types, including the fossil fuels and supergene ores The final chapter relates metallogeny to global tectonics by examining the distribution of mineral deposits in space and time Boxed examples of world famous ore deposits are featured throughout providing context and relevance to the process-oriented descriptions of ore genesis Brings the discipline of economic geology back into the realm of conventional mainstream earth science by emphasizing the fact that mineral deposits are simply one of the many natural wonders of geological process and evolution. Artwork from the book is available to instructors at www.blackwellpublishing.com/robb.

International Mineral Economics MDPI

The World's growing population and affluence requires exponential growth in mineral production. Add the political decisions to reduce carbon dioxide emissions, the change to electric vehicles and the drive to produce so-called renewable energy; and now the likelihood of long-term decreased availability of mined product from the Ukraine and Russia: the mining industry is tasked with a huge burden. And much new production will need to come from the underdeveloped and Third World

countries of the planet. The pointy end of the industry comprises geologists. This book contains 35 stories from 32 of them: they are all Western trained and most live in Australia. They share their experiences of working in these challenging countries. As well as presenting an inherently interesting, enjoyable, thought-provoking and non-technical collection of yarns, the reader will gain an appreciation of the fundamental role of geologists in the industry, as well as a better understanding of the difficulties facing them and their employers, and hence the future World. The book is graced with a Foreword by Pierpont (Trevor Sykes).

Structural Control of Mineral Deposits Geological Society of London

Mineral deposits are not only primary sources of wealth generation, but also act as windows through which to view the evolution and interrelationships of the Earth system. Deposits formed throughout the last 3.8 billion years of the Earth's history preserve key evidence with which to test fundamental questions about the evolution of the Earth. These include: the nature of early magmatic and tectonic processes, supercontinent reconstructions, the state of the atmosphere and hydrosphere with time, and the emergence and development of life. The interlinking processes that form mineral deposits have always sat at the heart of the Earth system and the potential for using deposits as tools to understand that evolving system over geological time is increasingly recognized. This volume contains research aimed both at understanding the origins of mineral deposits and at using mineral deposits as tools to explore different long-term Earth processes.

The Geology of Ore Deposits John Wiley & Sons

Mineral deposits have supplied useful or valuable material for human consumption long before they became objects of scientific curiosity or commercial exploitation. In fact, the earliest human interest in rocks was probably because of the easily accessible, useful (e. g. , red pigment in the form of earthy hematite) or valuable (e. g. , native gold and gemstones) materials they contained at places. In modern times, the study of mineral deposits has evolved into an applied science employing detailed field observations, sophisticated laboratory techniques for additional information, and computer modeling to build complex hypotheses. Understanding concepts that would someday help geologists to find new mineral deposits or exploit the known ones more efficiently have always been, and will continue to be, at the core of any course on mineral deposits, but it is a fascinating subject in its own right, even for students who do not intend to be professional economic geologists. I believe that a course on mineral deposits should be designed as a "capstone course" that illustrates a comprehensive application of concepts from many other disciplines in geology (mineralogy, stratigraphy and sedimentation, structure and tectonics, petrology, geochemistry, paleontology, geomorphology, etc.). This book is intended as a text for such an introductory course in economic geology, primarily for senior undergraduate and graduate students in colleges and universities. It should also serve as a useful information resource for professional economic geologists.

Applied Mineralogy in the Mining Industry Springer Science & Business Media

International Mineral Economics provides an integrated overview of the concepts important for mineral exploration, mine valuation, mineral market analysis, and international mineral policies. The treatment is interdisciplinary, drawing on the fields of economics, geology, business, and mining engineering. Part I, Economic Geology and Mineral Development, examines the technical concepts important for understanding the geology of ore deposits, the methods of exploration and deposit evaluation, and the activities of mining and mineral processing. Part II, Mineral Economics, focuses on the economic and related concepts important for understanding mineral development, the evaluation of exploration and mining projects, and mineral markets and market models. Finally, Part III, International Mineral Policies, reviews and traces the historical development of the policies of international organizations, the industrialized countries, and the developing countries.

Ore Deposit Geology and its Influence on Mineral Exploration University of Arizona Press

Mineral Exploration: Principles and Applications, Second Edition, presents an interdisciplinary approach on the full scope of mineral exploration. Everything from grass root discovery, objective base sequential exploration, mining, beneficiation, extraction, economic evaluation, policies and acts, rules and regulations, sustainability, and environmental impacts is covered. Each topic is presented using theoretical approaches that are followed by specific applications that can be used in the field. This new edition features updated references, changes to rules and regulations, and new sections on oil and gas exploration and classification, air-core drilling, and smelting and refining techniques. This book is a key resource for both academics and professionals, offering both practical and applied knowledge in mineral exploration. Offers important updates to the previous edition, including sections on the cyclical nature of mineral industry, exploration for oil and gas, CHIM-electro-geochemical survey, air-core drilling, classification of oil and gas resources, smelting, and refining technologies Presents global case studies that allow readers to quickly apply exploration concepts to real-world scenarios Includes 385 illustrations and photographs to aid the reader in understanding key procedures and applications

Introduction to Ore-Forming Processes Springer Nature

Nickel Sulfide Ores and Impact Melts: Origin of the Sudbury Igneous Complex presents a current state of understanding on the geology and ore deposits of the Sudbury Igneous Complex in Ontario, Canada. As the first complete reference on the subject, this book explores the linkage between the processes of meteorite impact, melt sheet formation, differentiation, sulfide immiscibility and metal collection, and the localization of ores by magmatic and post-magmatic processes. The discovery of new ore deposits requires industry and government scientists and academic scholars to have access to the latest understanding of ore formation process models that link to the mineralization of their host rocks. The ore deposits at Sudbury are one of the world's largest ore systems, representing a classic case study that brings together very diverse datasets and ways of thinking. This book is designed to emphasize concepts that can be applied across a broad range of ore deposit types beyond Sudbury and nickel deposit geology. It is an essential resource for exploration geologists, university researchers, and government scientists, and can be used in rock and mineral analysis, remote sensing, and geophysical applications. Provides the only reference book to focus entirely on the Sudbury Igneous Complex Brings together an understanding of ore deposit and impact melts as a basis for future exploration Authored by a leading expert on the geology of the Sudbury Igneous Complex with 35 years of experience working on nickel sulfide ore deposits

Introduction to Mineralogy and Petrology Geological Society of London

A comprehensive account of ore-forming processes, revised and updated The revised second edition of Introduction to Ore-Forming Processes offers a guide to the multiplicity of geological processes

that result in the formation of mineral deposits. The second edition has been updated to reflect the most recent developments in the study of metallogeny and earth system science. This second edition contains new information about global tectonic processes and crustal evolution that continues to influence the practice of economic geology and maintains the supply of natural resources in a responsible and sustainable way. The replenishment of depleted natural resources is becoming more difficult and environmentally challenging. There is also a change in the demand for mineral commodities and the concern around the non-sustainable supply of 'critical metals' is now an important consideration for planners of the future. The book puts the focus on the responsible custodianship of natural resources and the continuing need for all earth scientists to understand metallogeny and the resource cycle. This new edition: Provides an updated guide to the processes involved in the formation of mineral deposits Offers an overview of magmatic, hydrothermal and sedimentary ore-forming processes Covers the entire range of mineral deposit types, including the fossil fuels and supergene ores Relates metallogeny to global tectonics by examining the distribution of mineral deposits in space and time Contains examples of world famous ore deposits that help to provide context and relevance to the process-oriented descriptions of ore genesis Written for students and professionals alike, Introduction to Ore-Forming Processes offers a revised second edition that puts the focus on the fact that mineral deposits are simply one of the many natural wonders of geological process and evolution.

Nickel Sulfide Ores and Impact Melts Springer

"Structural Control" remains a crucial point that frequently lacks in any scientific and/or economic analysis of ore deposits, whatever their type and class. The case of lode deposits is exemplary, although also other deposits, like breccia pipe, stockwerk, massive sulphides, skarn, etc., can, surprisingly, be concerned. Several concepts like the gold-bearing shear zone have not proven valid during the last few decades in terms of our understanding of gold deposit and have been totally abandoned. Additionally, the relationships between magmatism, regional tectonic context, and mineralization remain uncertain and have been debated in several recent publications. This demonstrates that this issue is still relevant, and its solution may help in the distinction between intrusion-related and orogenic deposits. In this Special Issue, we particularly invite any case study of mineral deposits, in which it has been demonstrated that structural geology may have a significant role in the establishment of the deposit model of formation and/or on exploration and exploitation programs. Examples in which the structural model diverges from those described in the classical literature are particularly welcomed, including studies in which relationships with magmatism can be suspected and/or demonstrated. Indeed, all cases that illustrate concepts that differ from the classic ones and from theoretical models may represent significant contributions to this volume.

Processes and Ore Deposits of Ultramafic-Mafic Magmas through Space and Time Springer Science & Business Media

Completely revised and expanded, this fourth edition covers the 986 minerals found in Arizona, showcased with breathtaking new color photographs throughout the book. The new edition includes more than 200 new species not reported in the third edition and previously unknown in Arizona. Chapters in this fourth edition of Mineralogy of Arizona cover gemstones and lapidary materials, fluorescent minerals, and an impressive catalog of mineral species. The authors also discuss mineral districts, including information about the geology, mineralogy, and age of mineral occurrences throughout the state. The book includes detailed maps of each county, showing the boundaries and characteristics of the mineral districts present in the state. Arizona's rich mineral history is well illustrated by the more than 300 color photographs of minerals, gemstones, and fluorescent minerals that help the reader identify and understand the rich and diverse mineralogy of Arizona. Anyone interested in the mineralogy and geology of the state will find this the most up-to-date compilation of the minerals known to occur in Arizona.

Assessment of Ore Deposit Settings, Structures and Proximity Indicator Minerals in Geological Exploration Waveland Press

This vivid introduction to economic geology not only describes the most important deposit types, but also the processes involved in their formation. Magmatic, hydrothermal and sedimentary processes as well as weathering and alteration are explained in the framework of plate tectonics and the history of the Earth. The chapter about fossil fuels includes unconventional deposits and the much-debated fracking. Other topics covered are exploration, mining and economic aspects like commodity prices.

Mineral Deposits and Earth Evolution Cambridge University Press

Introduction to Mineralogy and Petrology, second edition, presents the essentials of both disciplines through an approach accessible to industry professionals, academic researchers, and students alike. This new edition emphasizes the relationship between rocks and minerals, right from the structures created during rock formation through the economics of mineral deposits. While petrology is classified on the lines of geological evolution and rock formation, mineralogy speaks to the physical and chemical properties, uses, and global occurrences for each mineral, emphasizing the need for the growth of human development. The primary goal is for the reader to identify minerals in all respects, including host-rocks, and mineral deposits, with additional knowledge of mineral-exploration, resource, extraction, process, and ultimate use. To help provide a comprehensive analysis across ethical and socio-economic dimensions, a separate chapter describes the hazards associated with minerals, rocks, and mineral industries, and the consequences to humanity along with remedies and case studies. New to the second edition: includes coverage of minerals and petrology in extra-terrestrial environments as well as case studies on the hazards of the mining industry. Addresses the full scope of core concepts of mineralogy and petrology, including crystal structure, formation and grouping of minerals and soils, definition, origin, structure and classification of igneous, sedimentary and metamorphic rocks Features more than 250 figures, illustrations and color photographs to vividly explore the fundamental principles of mineralogy and petrology Offers a holistic approach to both subjects, beginning with the formation of geologic structures that is followed by the hosting of mineral deposits and the exploration and extraction of lucrative, usable products that improve the health of global economies Includes new content on minerals and petrology in extraterrestrial environments and case studies on hazards in the mining industry

Atlas of Economic Mineral Deposits Springer Science & Business Media

Essentials of Mineral Exploration and Evaluation offers a thorough overview of methods used in mineral exploration campaigns, evaluation, reporting and economic assessment processes. Fully illustrated to cover the state-of-the-art exploration techniques and evaluation of mineral assets being practiced globally, this up-to-date reference offers balanced coverage of the latest knowledge and current global trends in successful mineral exploration and evaluation. From mineral deposits, to remote sensing, to sampling and analysis, Essentials of Mineral Exploration and Evaluation offers an extensive look at this rapidly changing field. Covers the complete spectrum of all aspects of ore deposits and mining them, providing a "one-stop shop" for experts and students Presents the most up-to-date information on developments and methods in all areas of mineral exploration Includes chapters on application of GIS, statistics, and geostatistics in mineral exploration and evaluation Includes case studies to enhance practical application of concepts

Handbook of Marine Mineral Deposits Geological Survey

This book presents a translation and update of the classic German textbook of Mineralogy and Petrology that has been published for decades. It provides an introduction to mineralogy, petrology, and geochemistry, discussing the principles of mineralogy, including crystallography, chemical bonding, and physical properties, and the genesis of minerals in a didactic and understandable way. Illustrated with numerous figures and tables, it also features several sections dedicated to the genesis of mineral resources. The textbook reflects the authors' many years of experience and is ideal for use in lectures on mineralogy and petrology.

Advanced Algorithms for Mineral and Hydrocarbon Exploration Using Synthetic Aperture Radar Springer Science & Business Media

Humanity's ever-increasing hunger for mineral raw materials, caused by a growing global population and ever increasing standards of living, has resulted in economic geology becoming a subject of urgent importance. This book provides a broad panorama of mineral deposits, covering their origin and geological characteristics, the principles of the search for ores and minerals, and the investigation of newly found deposits. Practical and environmental issues that arise during the life cycle of a mine and after its closure are addressed, with an emphasis on sustainable and "green" mining. The central scientific theme of the book is to place the extraordinary variability of mineral deposits in the frame of fundamental geological processes. The book is written for earth science students and practicing geologists worldwide. Professionals in administration, resource development, mining, mine reclamation, metallurgy, and mineral economics will also find the text valuable. Economic Geology is a fully revised translation of the the fifth edition of the German language text Mineralische und Energie-Rohstoffe. Additional resources for this book can be found at: www.wiley.com/go/pohl/geology. The author's website can be found at: <http://www.walter-pohl.com>.