

Geochemistry Of Hydrothermal Ore Deposits 3rd Edition

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 virtual resources and combines with the book to provide students and instructors with a complete learning package.

This volume covers the occurrence, interpretation and significance of bitumens (hydrocarbon residues) in ore deposits. Bitumens occur with a wide variety of ores, including deposits of base metals, mercury, uranium, gold and other precious metals. The papers included reflect this variety of bitumen occurrences and the potential for obtaining useful data from them. The contributions are written by acknowledged experts in this field, who cover analytical techniques and case studies using diverse petrographic and geochemical approaches which will give ore geologists and geochemists an excellent insight into the interpretation of bitumens during mineral exploration. The large number of plates in particular will help the non-specialist to make good use of the volume through the application to new deposits. This is the most comprehensive set of contributions published on a subject of growing interest; at a time when explorationists are increasingly recognising the occurrence of bitumens in ore deposits and the fact that the evolution of mineralising fluids and hydrocarbon fluids may be closely interlinked.

Within the last decade, the high and continuing demand for gold has prompted a global gold rush on a scale never before seen, not even in the heady days of Ballarat, California and the Yukon. Gold is being sought on every continent and, with very few exceptions, in every country around the world. Such interest and fierce competition has demanded considerable innovation and improvement in exploration techniques paralleled by a rapid expansion of the geological database and consequent genetic modelling for the many different types of gold deposits now recognized. This proliferation of data has swamped the literature and left explorationist and academic alike unable to sift more than a small proportion of the accumulating information. This new book represents an attempt to address this major problem by providing succinct syntheses fall major aspects ofgold metallogeny and exploration, ranging from the chemical distribution of gold in the Earth's crust, and the hydrothermal chemistry of gold, to Archaean and Phanerozoic lode deposits, epithermal environments, chemical sediments, and placer deposits, and culminates in chapters devoted to geochemical and geophysical exploration, and the economics of gold deposits. Each chapter is written by geoscientists who are acknowledged internationally in their respective fields, thus guaranteeing a broad yet up-to-date coverage. In addition, each chapter is accompanied by reference lists which provide readers with access to the most pertinent and useful publications.

In this book metal deposits, in particular those of non-ferrous and precious metals, are classified and analyzed in terms of their plate tectonic settings. This approach allows a meaningful treatment of metal deposits of different types and provides significant insights into both their genesis and formative environments. The updated 2nd edition incorporates the most significant advances in economic geology of the last 5 years. Particular attention is paid to the geological settings and generative models of gold deposits of all kinds.

A Comprehensive Reference Source on the Chemistry of the Earth

Geochemistry of Sedimentary Ore Deposits

Principles and Fundamental Concepts for the Exploration Geologist

Handbook of Stable Isotope Analytical Techniques

Mineralogical Magazine 44(333) 1981

Economic Geology

Volume 33 of Reviews in Mineralogy reviews the Mineralogy, Petrology, and Geochemistry of Boron. Contents: Mineralogy, Petrology and Geochemistry of Boron: An Introduction The Crystal Chemistry of Boron Experimental Studies on Borosilicates and Selected Borates Thermochemistry of Borosilicate Melts and Glasses – from Pyrex to Pegmatites Thermochemistry of Boron Minerals: Summary of Structural, Volumetric and Thermochemical Data Continental Borate Deposits of Cenozoic Age Boron in Granitic Rocks and Their Contact Aureoles Experimental Studies of Boron in Granitic Melts Borosilicates (Exclusive of Tourmaline) and Boron in Rock-forming Minerals in Metamorphic Environments Metamorphic Tourmaline and Its Petrologic Applications Tourmaline Associations with Hydrothermal Ore Deposits Geochemistry of Boron and Its Implications for Crustal and Mantle Processes Boron Isotope Geochemistry: An Overview Similarities and Contrasts in Lunar and Terrestrial Boron Geochemistry Electron Probe Microanalysis of Geologic Materials for Boron Analyses of Geological Materials for Boron by Secondary Ion Mass Spectrometry Nuclear Methods for Analysis of Boron in Minerals Parallel Electron Energy–Loss Spectroscopy of Boron in Minerals Instrumental Techniques for Boron Isotope Analysis (Parent with price) **Volume I contains subjective reviews, specialized and novel technique descriptions by guest authors. Part 1 includes contributions on purely analytical techniques and Part 2 includes matters such as development of mass spectrometers, stability of ion sources, standards and calibration, correction procedures and experimental methods to obtain isotopic fractionation factors. Volume II will be available in 2005.**

The development of sustainable supplies of critical minerals and metals is required if society is to succeed in the decarbonisation of the global economy. While the discovery of critical metal deposits is urgent, of equal importance is understanding the life cycle of critical metals that are already in the economy. This book includes ten empirical studies on both the discovery and investigations of the life cycle of critical metals. A wide range of critical metals in the hydrothermal system, including Co, Ga, Ge, Re, REEs, In, Sb, Sn and W, were investigated by researchers from China, Australia, North America and Europe. These studies present an advanced understanding of the genesis of global critical metal resources, by utilising traditional and non-traditional analytical approaches. This book also promotes the green mining concept. Innovative technological developments that allows extracting additional critical metals from current production and from historic mine wastes is reported. Academics and practitioners will find, in this book, very recent case studies of geochemistry, mineralogy, metallurgy and the exploration of critical metals in various hydrothermal systems, as well as the major challenges and opportunities facing academic research and industrial mineral exploration.

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>.

Hydrothermal Mineral Deposits

Hydrothermal Uranium Deposits

Fluid-Fluid Interactions

Understanding Mineral Deposits

Geochemical and Biogeochemical Reaction Modeling

Mineralogy, Geochemistry, Characteristics of Primary Ore Deposits, Prospecting, Processing and Applications Proceedings of a workshop in Berlin, November 1986

Many Neogene hydrothermal ore deposits have been formed on and near the Japanese islands from the middle Miocene to the present day and today many subaerial and submarine active geothermal systems are active. This book summarizes the geochemical and tectonic features, and the evolution of various types of ore deposits and current island arc and backarc hydrothermal systems in Japan starting with the Mesozoic.

Applied Geochemistry: Advances in Mineral Exploration Techniques is a book targeting all levels of exploration geologists, geology students and geoscientists working in the mining industry. This reference book covers mineral exploration techniques from multiple dimensions, including the application of statistics - both principal component analysis and factor analysis - to multifactorial modeling. The book explains these approaches step-by-step and gives their limitations. In addition to techniques and applications in mineral exploration, Applied Geochemistry describes mineral deposits and the theories underpinning their formation through worldwide case studies. Includes both conventional and nonconventional techniques for mineral exploration, including lithochemical methods Highlights the importance and applications of multifactorial models, 3D - mineral prospectively modeling Features case studies from mines and mineral exploration ventures around the world

This book is an outgrowth of my interest in the chemistry of sedimentary rocks. In teaching geochemistry, I realized that the best examples for many chemical processes are drawn from the study of ore deposits. Consequently, we initiated a course at The University of Cincinnati entitled "Sedimentary Ore Deposits," which serves as the final quarter course for both our sedimentary petrology and our ore deposits sequence, and this book is based on that teaching experience. Because of my orientation, the treatment given is perhaps more sedimentological than is usually found in books on ore deposits, but I hope that this proves to be an advantage. It will also be obvious that I have drawn heavily on the ideas and techniques of Robert Garrels. A number of people have helped with the creation of this book. I am especially grateful to my students and colleagues at Cincinnati and The Memorial University of Newfoundland for suffering through preliminary versions in my courses. I particularly thank Bill Janks, Malcolm Annis, and Dave Strong. For help with field work I thank A. Hallam, R. Hiscott, J. Hudson, R. Kefeler, P. O'Kita, A. Robertson, C. Stone, and R. Stevens. I am also deeply indebted to Bob Stevens for many hours of insightful discussion.

Modern civilizations dependence upon an increasing volume and diversity of minerals makes the search for new ore deposits ever more difficult. Now available from Waveland Press, Guilbert & Parks text presents ideas, principles, and data fundamental for beginning economic geologists to understand the genesis and localization of ore deposits and of the minerals associated with them. The authors comprehensively describe the physical and chemical characteristics of ore deposits and correlate them with environments and conditions of deposition, since ore deposits are best interpreted as extensions of the environments responsible for their enclosing rocks. Examples and illustrations emphasize structural, chemical, and temporal controls and encourage the three-dimensional thinking used by productive explorationists as they face unsolved problems. This upper-level undergraduate text is fully illustrated and meticulously indexed. Its reliable, authoritative coverage assumes an upper-level command of chemistry and physics, as well as mineralogy, petrology, and structural geology. Outstanding features . . . develops and combines the abilities of the explorationist and of the researcher of ore-forming processes structures the geologic descriptions into groupings recognized by researchers and explorers alike builds confidence, revitalizes curiosity, and encourages expanded thinking emphasizes that the days of easy discovery of outcropping ores are not over includes revised, expanded, and updated descriptions of districts

Geochemical and Tectonic Evolution of Arc-Backarc Hydrothermal Systems

Geochemistry of Hydrothermal Ore Deposits

Critical Metals in Hydrothermal Ores

Magmatic Systems

Hydrothermal Processes and Mineral Systems

Hydrothermal Systems

Written expressly for undergraduate and graduate geologists, this book focuses on how geochemical principles can be used to solve practical problems. The attention to problem-solving reflects the authors'belief that showing how theory is useful in solving real-life problems is vital for learning. The book gives students a thorough grasp of the basic principles of the subject, balancing the traditional equilibrium perspective and the kinetic viewpoint. The first half of the book considers processes in which temperature and pressure are nearly constant. After introductions to the laws of thermodynamics, to fundamental equations for flow and diffusion, and to solution chemistry, these principles are used to investigate diagenesis, weathering, and natural waters. The second half of the book applies thermodynamics and kinetics to systems undergoing changes in temperature and pressure during magmatism and metamorphism. This revised edition incorporates new geochemical discoveries as examples of processes and pathways, with new chapters on mineral structure and bonding and on organic matter and biomarkers. Each chapter has worked problems, and the authors assume that the student has had a year of college-level chemistry and a year of calculus. Praise for the first edition "A truly modern geochemistry book.... Very well written and quite enjoyable to read.... An excellent basic text for graduate level instruction in geochemistry." -- Journal of Geological Education "An up-to-date, broadly conceived introduction to geochemistry.... Given the recent flowering of geochemistry as an interdisciplinary science, and given the extent to which it now draws upon the fundamentals of thermodynamics and kinetics to understand earth and planetary processes, this timely and rigorous [book] is welcome indeed." -- Geochimica et Cosmochimica Acta

The Encyclopedia is a complete and authoritative reference work for this rapidly evolving field. Over 200 international scientists, each experts in their specialties, have written over 330 separate topics on different aspects of geochemistry including geochemical thermodynamics and kinetics, isotope and organic geochemistry, meteorites and cosmochemistry, the carbon cycle and climate, trace elements, geochemistry of high and low temperature processes, and ore deposition, to name just a few. The geochemical behavior of the elements is described as is the state of the art in analytical geochemistry. Each topic incorporates cross-referencing to related articles, and also has its own reference list to lead the reader to the essential articles within the published literature. The entries are arranged alphabetically, for easy access, and the subject and citation indices are comprehensive and extensive. Geochemistry applies chemical techniques and approaches to understanding the Earth and how it works. It touches upon almost every aspect of earth science, ranging from applied topics such as the search for energy and mineral resources, environmental pollution, and climate change to more basic questions such as the Earth’s origin and composition, the origin and evolution of life, rock weathering and metamorphism, and the pattern of ocean and mantle circulation. Geochemistry allows us to assign absolute ages to events in Earth’s history, to trace the flow of ocean water both now and in the past, trace sediments into subduction zones and arc volcanoes, and trace petroleum to its source rock and ultimately the environment in which it formed. The earliest evidence of life is chemical and isotopic traces, not fossils, preserved in rocks. Geochemistry has allowed us to unravel the history of the ice ages and thereby deduce their cause.

Geochemistry allows us to determine the swings in Earth’s surface temperatures during the ice ages, determine the temperatures and pressures at which rocks have been metamorphosed, and the rates at which ancient magma chambers cooled and crystallized. The field has grown rapidly more sophisticated, in both analytical techniques that can determine elemental concentrations or isotope ratios with exquisite precision and in computational modeling on scales ranging from atomic to planetary.

The authors provide the most up-to-date, cutting-edge research. Magmatic Systems skillfully explores the physical processes, mechanics, and dynamics of volcanism. The text utilizes a synthesized perspective—theoretical, experimental, and observational—to address the powerful regulatory mechanisms controlling the movement of melts and cooling, with emphasis on mantle plumes, mid-ocean ridges, and intraplate magmatism. Further coverage of subduction zone magmatism includes: Fluid mechanics of magma migration Internal structure of active magmatic systems * Grain-scale melt flow in mantle plumes and beneath mid-ocean ridges * Physics of magmatic systems and magma dynamics

Rare Earth Elements (REE) as well as tantalum and niobium are of tremendous importance because of their specific high-technology applications. The contributions gathered in this volume give an up-to-date survey on the mineralogy, primary ore deposits, prospecting, processing and applications of REE, Ta, and Nd, making this volume a useful handbook for practitioners and students. Finally, the comprehensive coverage of the fundamental aspects, especially as regards REE as tracers of geological phenomena, will prove extremely helpful.

Gold metallogeny and exploration

Geology and Geochemistry of Epithermal Systems

Bitumens in Ore Deposits

Rare Earth Minerals

Advances in Mineral Exploration Techniques

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.

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 that includes the study of the origin, development, and dynamics of volcanism. The text utilizes a synthesized perspective—theoretical, experimental, and observational—to address the powerful regulatory mechanisms controlling the movement of melts and cooling, with emphasis on mantle plumes, mid-ocean ridges, and intraplate magmatism. Further coverage of subduction zone magmatism includes: Fluid mechanics of magma migration Internal structure of active magmatic systems * Grain-scale melt flow in mantle plumes and beneath mid-ocean ridges * Physics of magmatic systems and magma dynamics

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30% discount for members of The Mineralogical Society of Britain and Ireland
Rare Earth Minerals presents a current overview of this geologically and industrially important group of minerals. It presents a wide variety of formats, crystal structures, petrographic descriptions, analytical data and numerous illustrations from outcrop photos to SEM pictures and crystallographic models.

Why another book about Ore Deposits? There are a number of factors which motivated us to write this text and which may provide an answer to this question. Firstly our colleagues are predominantly mining engineers and minerals processing technologists, which provides us with a different perspective of ore deposits from many academic geologists. Secondly we have found that most existing texts are either highly theoretical or merely descriptive: we have attempted to examine the practical implications of the geological setting and genetic models of particular ore deposit types. We have written the text primarily for undergraduates who are taking options in Economic Geology towards the end of a Degree Course in Geology. However, we hope that the text will also prove valuable to geologists working in the mining industry. The text is to a large extent based on a review of the existing literature up to the end of 1984. However, we have visited most of the mining districts cited in the text and have also corresponded extensively with geologists to extend our knowledge beyond the published literature. Nonetheless writing a text-book on Ore Deposits is a demanding task and it is inevitable that sins of both omission and commission have been committed. We would therefore welcome comments from readers which can be incorporated in future editions. RICHARD EDW ARDS KEITH ATKINSON Cmmhose School
(—nIlilcfs April 1985 Glossary Adit A horizontal, or near horizontal, passage from the surface into a mme.

Principles and Practice

Ore Deposit Geology and its Influence on Mineral Exploration

Pathways and Processes

Origin, Exploration, and Exploitation

Boron

Empirical Metallogeny

This book provides a comprehensive overview of reaction processes in the Earth's crust and on its surface, both in the laboratory and in the field. A clear exposition of the underlying equations and calculation techniques is balanced by a large number of fully worked examples. The book uses The Geochemist's Workbench® modeling software, developed by the author and already installed at over 1000 universities and research facilities worldwide. Since publication of the first edition, the field of reaction modeling has continued to grow and find increasingly broad application. In particular, the description of microbial activity, surface chemistry, and redox chemistry within reaction models has become broader and more rigorous. These areas are covered in detail in this new edition, which was originally published in 2007. This text is written for graduate students and academic researchers in the fields of geochemistry, environmental engineering, contaminant hydrology, geomicrobiology, and numerical modeling.

This thoroughly revised and expanded new edition incorporates the most recent research findings on the subject, such as the discovery of dramatic underwater hydrothermal vents. It describes the key process in the generation of ore deposits and emphasizes solid theoretical understanding.

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 metallogenetic 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/robh.

Ore deposits form by a variety of natural processes that concentrate elements into a volume that can be economically mined. Their type, character and abundance reflect the environment in which they formed and thus they preserve key evidence for the evolution of magmatic and tectonic processes, the state of the atmosphere and hydrosphere, and the evolution of life over geological time. This volume presents 13 papers on topical subjects in ore deposit research viewed in the context of Earth evolution. These diverse, yet interlinked, papers cover topics including: controls on the temporal and spatial distribution of ore deposits; the sources of fluid, gold and other components of orogenic gold deposits; the degree of oxygenation in the Neoproterozoic ocean; bacterial immobilization of gold in the semi-arid near-surface environment; and mineral resources for the future, including issues of resource estimation, sustainability of supply and the criticality of certain elements to society.

Implication for the Origin of Kuroko and Epithermal Vein-Type Mineralizations and the Global Geochemical Cycle

Granite-related Ore Deposits

Geochemistry of Hydrothermal Ore Deposits (2nd Ed), Edited by H.L. Barnes : Book Review

Thermodynamics of Geothermal Fluids

Ore Deposits in an Evolving Earth

Lanthanides, Tantalum and Niobium

Geochemistry of Hydrothermal Ore DepositsJohn Wiley & Sons

Granite-related ore deposits in an evolving Earth – Evolutionary development of granitic pegmatites associated with orogens throughout geological time -- Late Neoproterozoic-Cambrian granitic magmatism in the Arcaual orogen (Brazil), the Eastern Brazilian Pegmatite Province and related mineral resources -- Tourmaline nodules: products of devolatilization within the final evolutionary stage of granitic melt? -- Geochemical characteristics of Miocene Fe-Co-Pb-Zn granulitoids associated mineralization in the Chichibu skarn deposit (central Japan): evidence for magmatic fluids generation coexisting with granitic melt – Fractal analysis of the ore-forming process in a skarn deposit: a case study in the Shizhan area, China -- Geology, petrology and alteration geochemistry of the Palaeoproterozoic intrusive related Altragsk Au deposit, Northern Sweden -- Geological setting, alteration, and fluid inclusion characteristics of Zaglic and Saffikhanloo epithermal gold prospects, NW Iran -- Magma mixing and unmixing related mineralization in the Karacaali Magmatic Complex, central Anatolia, Turkey -- Geochemical indicators of metalliferous fertility in the Carboniferous San Blas pluton, Sierra de Velasco, Argentina

Hydrothermal processes on Earth have played an important role in the evolution of our planet. These processes link the lithosphere, hydrosphere and biosphere in continuously evolving dynamic systems. Terrestrial hydrothermal processes have been active since water condensed to form the hydrosphere, most probably from about 4.4 Ga. The circulation of hot aqueous solution (hydrothermal systems) at, and below, the Earth's surface is ultimately driven by magmatic heat. This book presents an in-depth review of hydrothermal proceses and systems that form beneath the oceans and in intracontinental rifts, continental margins and magmatic arcs. The interaction of hydrothermal fluids with rockwalls, the hydrophere and the biophere, together with changes in their composition through time and space, contribute to the formation of a wide range of mineral deposit types and associated wallrock alteration. On Earth, sites of hydrothermal activity support varied ecosystems based on a range of chemotrophic microorganisms both at surface and in the subsurface. This book also provides an overview of hydrothermal systems associated with meteorite impacts and explores the possibility that hydrothermal processes operate on other terrestrial planets, such as Mars, or satellites of the outer planets such as Titan and Europa. Possible analogues of extraterrestrial putative hydrothermal processes pose the intriguing question of whether primitive life, as we know it, may exist or existed in these planetary bodies. Audience: This volume will be of interest to scientists and researchers in geosciences and life sciences departments, as well as to professionals and scientists involved in mining and mineral exploration.

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.

Metal Deposits in Relation to Plate Tectonics

Gold Metallogeny and Exploration

Applied Geochemistry

Geochemistry

Introduction to Ore-Forming Processes

Encyclopedia of Geochemistry

Empirical Metallogeny: Developmental Environments, Lithologic Associations, and Metallic Ores, Vol. 1: Phanerozoic Environments, Associations, and Deposits, Part B focuses on the composition, characteristics, properties, and reactions of Phanerozoic metallic ore deposits. The book first offers information on intracrustal and subcrustal environments and plutonic granite, diorite, (gabbro) association (GDG) and its aureole. Discussions focus on the distribution and mineralization styles associated with Phanerozoic (higher-level) granitic, diorite, (gabbro) association; copper skarns and carbonate replacements; and magnetite skarns and replacement deposits. Manganese, uranium, antimony, mercury, and arsenic deposits, hydrothermal iron ores, and hydrothermal-plutonic silver deposits are also discussed. The publication also takes a look at high- to medium-grade metamorphosed terrains, katabazal granites and pegmatites and continental fragmentation, rifts, and paleo-rifts. Topics include examples of medium rift and taphrogenic systems; mineralization styles and related to the zone of ultrametamorphism and granulitization; and petrography, origin, and setting of high-grade metamorphic terrains. The text is a valuable reference for readers interested in the study of Phanerozoic metallic ore deposits.

This book is intended primarily for exploration geologists and post graduate students attending specialist courses in mineral exploration. Exploration geologists are engaged not only in the search for new mineral deposits, but also in the extension and re-assessment of existing ones. To succeed in these tasks, the exploration geologist is required to be a "generalist" of the Earth sciences rather than a specialist. The exploration geologist needs to be familiar with most aspects of the geology of ore deposits, and detailed knowledge as well as experience play an all important role in the successful exploration for mineral commodities. In order to achieve this, it is essential that the exploration geologist be up to date with the latest developments in the evolution of concepts and ideas in the Earth sciences. This is no easy task, as thousands of publications appear every year in an ever increasing number of journals, periodicals and books. For this reason it is also difficult, at times, to locate appropriate references on a particular mineral deposit type, although this problem is alleviated by the existence of large bibliographic data bases of geological records, abstracts and papers on computers. During my teaching to explorationists and, indeed, during my years of work as an explorationist, the necessity of having a text dealing with the fundamental aspects of hydrothermal mineral deposits has always been compelling. Metallic mineral deposits can be categorised into three great families, namely: (1) magmatic; (2) sedimentary and residual; (3) hydrothermal.

This is a complete and authoritative reference text on an evolving field. Over 200 international scientists have written over 340 separate topics on different aspects of geochemistry including organics, trace elements, isotopes, high and low temperature geochemistry, and ore deposits, to name just a few.

Volume 76 of Reviews in Mineralogy and Geochemistry presents an extended review of the topics conveyed in a short course on **Geothermal Fluid Thermodynamics** held prior to the 23rd Annual V.M. Goldschmidt Conference in Florence, Italy (August 24-25, 2013). It covers **Thermodynamics of Geothermal Fluids, The Molecular-Scale Fundament of Geothermal Fluid Thermodynamics, Thermodynamics of Aqueous Species at High Temperatures and Pressures: Equations of State and Transport Theory, Mineral Solubility and Aqueous Speciation Under Hydrothermal Conditions to 300 °C – The Carbonate System as an Example, Thermodynamic Modeling of Fluid-Rock Interaction at Mid-Crustal to Upper-Mantle Conditions, Speciation and Transport of Metals and Metalloids in Geological Vapors, Solution Calorimetry Under Hydrothermal Conditions, Structure and Thermodynamics of Subduction Zone Fluids from Spectroscopic Studies and Thermodynamics of Organic Transformations in Hydrothermal Fluids.**

Ore Deposits

Mineralogy, Petrology, and Geochemistry

Ore Deposit Geology

Geochemistry of Magnetite from Hydrothermal Ore Deposits and Host Rocks – Case Studies from the Proterozoic Belt Supergroup, Cu-Mo-porphry + Skarn and Clinax-Mo Deposits in the Western United States

Geochemistry of Gold and Selenium in Hydrothermal Ore Deposits

The Timing and Location of Major Ore Deposits in an Evolving Orogen

The latest knowledge on mineral ore genesis and the exploration of ore deposits Global demand for metals has risen considerably over the past decade. Geologists are developing new approaches for studying ore deposits and discovering new sources. Ore Deposits: Origin, Exploration, and Exploitation is a compilation of diverse case studies on new prospects in ore deposit geology including atypical examples of mineral deposits and new methods for ore exploration. Volume highlights include: Presentation of the latest research on a range of ore deposit types Application of ore deposits to multiple areas of geology and geophysical exploration Emphasis on diverse methods and tools for the study of ore deposits Useful case studies for geologists in both academia and industry Ore Deposits: Origin, Exploration, and Exploitation is a valuable resource for economic geologists, mineralogists, petrologists, geochemists, mining engineers, research professionals, and advanced students in relevant areas of academic study.

Within the last decade, the high and continuing demand for gold has prompted a global gold rush on a scale never before seen, not even in the heady days of Ballarat, California and the Yukon. Gold is being sought on every continent and, with very few exceptions, in every country around the world. Such interest and fierce competition has demanded considerable innovation and improvement in exploration techniques paralleled by a rapid expansion of the geological database and consequent genetic modelling for the many different types of gold deposits now recognized. This proliferation of data has swamped the literature and left explorationist and academic alike unable to sift more than a small proportion of the accumulating information. This new book represents an attempt to address this major problem by providing succinct syntheses of all major aspects of gold metallogeny and exploration, ranging from the chemical distribution of gold in the Earth's crust, and the hydrothermal chemistry of gold, to Archaean and Phanerozoic lode deposits, epithermal environments, chemical sediments, and placer deposits, and culminates in chapters devoted to geochemical and geophysical exploration, and the economics of gold deposits. Each chapter is written by geoscientists who are acknowledged internationally in their respective fields, thus guaranteeing a broad yet up-to-date coverage. In addition, each chapter is accompanied by reference lists which provide readers with access to the most pertinent and useful publications.

Depositional Environments, Lithologic Associations and Metallic Ores

The Geology of Ore Deposits

