

## Mineral Exploration Principles And Applications

Platinum-Nickel-Chromium Deposits: Geology, Exploration, and Reserve Base is the first reference book to combine information on the discovery of numerous minerals within existing deposits. This book recognizes the close affinity and great natural coexistence of platinum, palladium, chromium, nickel, copper, gold, and silver hosted by unique stratigraphy (mafic-ultramafic intrusive of layered igneous complex) in a diverse structural set up. The chapters are organized in a logical sequence of introductory physical and chemical properties, demand-supply scenario, price trend, substitution-recycling and uses of these metals, stratigraphy and host rocks, geochemistry, global distribution of existing deposits in six mega continents, genetic system, reserves-resources overview, common characteristic features aiding as exploration guides for new targets, hazards, and sustainable development. This reference book is a must for students, research scholars, teachers, and professional explorers in economic geology, geography, and allied subjects. Presents over 150 full color illustrations including maps, diagrams, and charts Illustrates the key concepts in a clear and informative manner Authored by one of the world's leading geoscientists Provides unique coverage of high value mineral deposits through an approach accessible to industry professionals, academic researchers, and students alike

Mineral Exploration Principles and Applications Elsevier

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 multifractal 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 lithogeochemical methods Highlights the importance and applications of multifractal models, 3D - mineral prospectivity modeling Features case studies from mines and mineral exploration ventures around the world

Minerals are part of virtually every product we use. Common examples include copper used in electrical wiring and titanium used to make airplane frames and paint pigments. The Information Age has ushered in a number of new mineral uses in a number of products including cell phones (e.g., tantalum) and liquid crystal displays (e.g., indium). For some minerals, such as the platinum group metals used to make catalytic converters in cars, there is no substitute. If the supply of any given mineral were to become restricted, consumers and sectors of the U.S. economy could be significantly affected. Risks to minerals supplies can include a sudden increase in demand or the possibility that natural ores can be exhausted or become too difficult to extract. Minerals are more vulnerable to supply restrictions if they come from a limited number of mines, mining companies, or nations. Baseline information on minerals is currently collected at the federal level, but no established methodology has existed to identify potentially critical minerals. This book develops such a methodology and suggests an enhanced federal initiative to collect and analyze the additional data needed to support this type of tool.

Globally, mineral exploration has grown significantly in recent years, driven by the rapid acceleration in prices for gold and diamonds since 2004 and the emergence of a middle class in both China and India—aggressively increased demand. Despite this resurgence, no single book has been published that takes an interdisciplinary approach in addressing the full scope of mineral exploration—from mining and extraction to economic evaluation, policies, sustainability, and environmental impacts. Mineral Exploration: Principles and Applications accomplishes this by presenting each topic with theoretical approaches first followed by specific applications that can be immediately implemented in the field.

Presents 16 case studies that allow readers to quickly apply exploration concepts to real-life scenarios in the field Includes more than 200 illustrations and full-color photographs that aid the reader in retaining key procedures and applications Each chapter is structured so that its topic is discussed theoretically first followed by specific applications Combines both theory and application in a multidisciplinary reference that thoroughly addresses the full scope of mineral exploration Authored by an instructor with more than 30 years of experience in the field and a decade as a consultant for commercial mining companies

The book introduces essential concept of mineral exploration, mine evaluation and resource assessment of the discovered mineral deposit to students, beginners and professionals. The book is divided into nine chapters which will help the readers to incorporate the concepts of search for mineral deposits and understand the chances of success. The book discusses the fundamental details like composition of earth and mineral resources, formation of rock and mineral deposits, and the attempt to search for ore deposits to advance applications of remote sensing in mineral exploration. It also covers the details on how to conduct system of survey, evaluation, and how to arrive at a decision to open and carryout further exploration in the operating mine. The book shall be of great interest to geologists and mining community.

Selected Readings in Mineral Economics reviews the economic principles of mineral investment activities and mining decisions. Topics range from mineral reserves and exploration to the economics of mineral projects, taxation issues, and marketing and finance. This text is comprised of 27 chapters. After explaining the distinction between resources and reserves, this book proposes a concept of mineral reserves. The chapters that follow explore the conversion of resources into reserves through the exploration process, while focusing on the flow from resources to reserves and metal production based on the concept of the "monitoring curve," along with the process of depletion and reserves replacement. The next section illustrates the range of issues associated with rational project evaluation in the minerals sector, considering the discounted cash flow

techniques and option pricing as an approach to mine valuation. The effects of Canada's tax system on the mineral supply process are then examined, together with international mineral markets and finance. This text concludes with a chapter that analyzes financing methods for large-scale mining projects, including innovative methods of debt finance involving risk sharing. This book will be of interest to those working in the mining and metallurgical industries.

Handbook of Exploration Geochemistry, Volume 3: Rock Geochemistry in Mineral Exploration focuses on the application of rock geochemistry in mineral exploration, including deposits of plutonic association, volcanic and sedimentary association, and sequence of geochemical exploration. The publication first elaborates on geochemistry in the exploration sequence, crustal abundance, geochemical behavior of elements, and problems of sampling and recognition of geochemical anomalies. Discussions focus on population partition, spatial distribution of data, abundance of elements, classification and geochemical behavior of elements, principles underlying geochemical exploration, sequence of geochemical exploration, and main types of geochemical surveys. The text then takes a look at regional scale exploration for deposits of plutonic association; regional scale exploration for vein and replacement deposits; and regional scale exploration for stratiform deposits of volcanic and sedimentary association. The book ponders on the synthesis of geochemical responses and operational conclusions, local and mine scale exploration for stratiform deposits of volcanic and sedimentary association in Cyprus, Turkey, and Oceania, New Brunswick deposits, and Precambrian, Proterozoic, and Kuroko deposits. The text is a valuable reference for researchers interested in the application of rock geochemistry in mineral exploration.

Providing a balance between principles and practice, this state-of-the-art overview of geophysical methods takes readers from the basic physical phenomena, through the acquisition and processing of data, to the creation of geological models of the subsurface and data interpretation to find hidden mineral deposits. Detailed descriptions of all the commonly used geophysical methods are given, including gravity, magnetic, radiometric, electrical, electromagnetic and seismic methods. Each technique is described in a consistent way and without complex mathematics. Emphasising extraction of maximum geological information from geophysical data, the book also explains petrophysics, data modelling and common interpretation pitfalls. Packed with full-colour figures, also available online, the text is supported by selected examples from around the world, including all the major deposit types. Designed for advanced undergraduate and graduate courses in minerals geoscience, this is also a valuable reference for professionals in the mining industry wishing to make greater use of geophysical methods. In 2015, Dentith and Mudge won the ASEG Lindsay Ingall Memorial Award for their combined effort in promoting geophysics to the wider community with the publication of this title.

This book is written as a practical field manual to effective. Each geologist has to develop his/her own techniques and will ultimately be judged on results. It is also hoped that it will serve as a text results, not the process by which these results and reference for students in Applied Geology were reached. In mineral exploration, the only courses of universities and colleges. The book 'right' way of doing anything is the way that aims to outline some of the practical skills that locates ore in the quickest and most cost-effective turn the graduate geologist into an explorer. It is preferable, however, for an individual geologist. It is intended as a practical 'how to' manual to develop his/her own method of operation book, rather than as a text on geological or ore after having tried, and become aware of, those deposit theory. procedures which experience has shown to work An explorationist is a professional who search well and which are generally accepted in industry as good exploration practice. es for ore bodies in a scientific and structured way. Although an awkward and artificial term, The chapters of the book approximately follow this is the only available word to describe the low the steps which a typical exploration professional would go through. In Chapter 1, the author defines economic mineralization.

The Office of Industrial Technologies (OIT) of the U. S. Department of Energy commissioned the National Research Council (NRC) to undertake a study on required technologies for the Mining Industries of the Future Program to complement information provided to the program by the National Mining Association. Subsequently, the National Institute for Occupational Safety and Health also became a sponsor of this study, and the Statement of Task was expanded to include health and safety. The overall objectives of this study are: (a) to review available information on the U.S. mining industry; (b) to identify critical research and development needs related to the exploration, mining, and processing of coal, minerals, and metals; and (c) to examine the federal contribution to research and development in mining processes.

The Business of Mining complete set of three Focus books provides readers with a holistic all-embracing appraisal of the analytical tools available for assessing the economic viability of prospective mines. Each volume has a discrete focus. This third volume commences with "Our Earth, its Minerals and Ore Bodies", followed by a review of mineral exploration and sampling of mineral deposits. It continues with detailed sections covering the reporting of mineral resources and reserves in Australia, and concludes with the basic principles and application of the various methods of estimating the in-situ mineral resources and ore reserves. The books were written primarily for undergraduate applied geologists, mining engineers and extractive metallurgists and those pursuing course-based postgraduate programs in mineral economics. However, the complete series will also be an extremely useful reference text for practicing mining professionals as well as for consultant geologists, mining engineers or primary metallurgists.

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

This textbook provides an introduction to the field of mineral economics and its use in understanding the behaviour of mineral commodity markets and in assessing both public and corporate policies in this important economic sector. The focus is on metal and non-metallic commodities rather than oil, coal, and other energy commodities. The work draws on John Tilton's teaching experience over the last 30 years at the Colorado School of Mines and the Catholic University of Chile, as well as short courses for RioTinto and other mining companies. This is combined with the professional consulting and academic research of Juan Ignacio Guzmán over the past decade, in order to demonstrate the industry application of the economic principles described in the earlier chapters. The book should be an ideal text for graduate and undergraduate students in the fields of mining engineering and natural resource economics and policy. It should also be of interest to professionals and investors in mining and commodity

markets, and those undertaking continuing education in the mineral sector.

The considerable exploration success achieved by geochemistry over the last several decades - and still continuing - has provided both the basis and rationale for the Handbook of Exploration Geochemistry series, including Volume 6, Drainage Geochemistry in Mineral Exploration. With contributions from 25 experts of truly global professional experience in drainage geochemistry, this book is a thorough appraisal of the state of the art in the use of surface and sub-surface waters, stream and lake sediments, heavy minerals for mineral exploration in tropical rain forests, temperate glaciated terrains, mountain chains, arid deserts and regions of agricultural and industrial pollution. Additional attention is given to gold and uranium exploration, and to the growing role of drainage geochemistry as a multi-purpose environmental mapping technique with applications in human health studies, ore deposit modelling and pollution monitoring. It comprises 16 chapters, more than 250 figures and a bibliography of some 1600 references. This book is the most extensive and detailed single work on the principles and applications of drainage geochemistry in mineral exploration blending both theoretical considerations and practical implementations.

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

Mineral Exploration: Principles and Applications, Second Edition, presents an interdisciplinary approach to addressing the full scope of mineral exploration: from grass root discovery, objective base sequential exploration, mining, beneficiation, and extraction, to economic evaluation, Policies and Acts, rules and regulations, sustainability, and environmental impacts. Each topic is presented first using theoretical approaches, followed by specific applications that can be used in the field. The new edition features updated references, changes to rules and regulations associated with Policies and Acts, as well as new sections on oil and gas exploration and classification, air-core drilling, and smelting and refining techniques. Mineral Exploration: Principles and Applications, 2e, 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, and smelting and refining technologies Presents case studies - including new global studies - that allow readers to quickly apply exploration concepts to real-world scenarios in the field Includes more than 150 illustrations and full-color photographs to aid the reader in understanding key procedures and applications

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Authored by two of the world's premier experts, this book is a must for any young professional, researcher, or student looking for a thorough and inclusive guide to mineralogy and petrology in a single source. Authored by two of the world's experts in mineralogy and petrology, who have more than 70 years of experience in research and instruction combined Addresses the full scope of the 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 150 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 followed by the hosting of mineral deposits and concluding with the exploration and extraction of lucrative, usable products to improve the health of global economies

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This new, up dated edition of Introduction to Mineral Exploration provides a comprehensive overview of all aspects of mineral exploration. Covers not only the nature of mineral exploration but also considers other factors essential to successful exploration, from target evaluation to feasibility studies for extraction and production. Includes six detailed case studies, selected for the range of different problems and considerations they present to the mineral explorationist. Features new chapters on handling mineral exploration data and a new case study on the exploration for diamonds. Essential reading for upper level undergraduates studying ore geology, mineral exploration, mining geology, coal exploration, and industrial minerals, as well as professional geologists. Artwork from the book is available to instructors online at [www.blackwellpublishing.com/moon](http://www.blackwellpublishing.com/moon).

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 special volume offers a snapshot of the latest developments in mineral exploration, in particular, geophysical, geochemical, and computational methods. It reflects the cutting-edge applications of geophysics and geochemistry, as well as novel technologies, such as in artificial intelligence and hyperspectral exploration, methods that have profoundly changed how exploration is conducted. This special volume is a representation of these cutting-edge and pioneering methods to consider and conduct exploration, and should serve both as a valuable compendium of the most innovative exploration methodologies available and as a foreshadowing of the form of future exploration. As such, this volume is of significant importance and would be useful to any exploration geologist and company.

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 combination of textbook and reference manual provides a comprehensive account of gravity and magnetic methods for exploring the subsurface using surface, marine, airborne and satellite measurements. It describes key current topics and techniques, physical properties of rocks and other earth materials, and digital data analysis methods used to process and interpret anomalies for subsurface information. Each chapter starts with an overview and concludes by listing key concepts to consolidate new learning. An accompanying website presents problem sets and interactive computer-based exercises, providing hands-on experience of processing, modeling and interpreting data. A comprehensive online suite of full-color case histories illustrates the practical utility of modern gravity and magnetic surveys. This is an ideal text for advanced undergraduate and graduate courses and reference text for research academics and professional geophysicists. It is a valuable resource for all those interested in petroleum, engineering, mineral, environmental, geological and archeological exploration of the lithosphere.

The Chemistry of Gold Extraction bridges the gap between research and industry by emphasizing the practical applications of chemical principles and techniques. Covering what everyone in the gold extraction and processing industries should know: Historical Developments; Ore Deposits and Process Mineralogy; Process Selection; Principles of Gold Hydrometallurgy; Oxidative Pretreatment; Leaching; Solution Purification and Concentration; Recovery; Surface Chemical Methods; Refining; Effluent Treatment; and Industrial Applications. This book is a valuable asset for all professionals involved in the precious metals industries. It will be of particular interest and use to engineers and scientists (including extraction metallurgists, mineral/metallurgical engineers, electrochemists, chemical engineers, mineral technologists, mining engineers, and material scientists), plant managers and operators, academics, educators, and students working in gold extraction in either production, research, or consulting capacities.

"Informed decisions concerning undiscovered mineral resources cannot be made without an understanding of the technological, environmental, or economic difficulties that might be encountered. Quantitative Mineral Resource Assessments: An Integrated Approach offers a modern quantitative assessment that explicates the diverse factors that affect mineral-related decisions, so that potential consequences can be more easily assessed, uncertainty and risk reduced, and courses of action determined without bias. The integrated approach focuses on three assessment parts and the models that support them and is designed so that consequences of alternative courses of action can be examined with respect to land use, exploration, or mineral-resource development. Drawing upon newly developed deposit density models, frequency distributions, and previously unpublished experiments, the book provides an essential and practical approach for making critical decisions." "Written for governmental and industrial policy makers, managers of exploration, planners of regional development, and similar decision makers, the book brings together for the first time the widely scattered literature on the subject. It also captures the necessary ingredients of the diverse disciplines of economic geology, statistics, mineral economics, and geology that are an integral part of quantitative mineral resource assessments. With this wealth of information, the book will serve not only as a guide for professionals but also as a comprehensive reference for those studying or researching mineral resources."--BOOK JACKET.

This practical guidebook provides a basic grounding in the principles of geology and explains how to apply them. Using this book, readers will be able to figure out whether they are standing on an ancient seafloor, coal swamp, or sand dune. They will be able to determine the geologic hazards in their neighborhood, where to look for fossils and minerals, or where best to drill a water well. In plain English, The Geology Companion sheds light on the processes that shape the earth and how geology affects people in their daily lives.

This comprehensive textbook covers all major topics related to the utilization of mineral resources for human activities. It begins with general concepts like definitions of mineral resources, mineral resources and humans, recycling mineral resources, distribution of minerals resources across Earth, and international standards in mining, among others. Then it turns to a classification of mineral resources, covering the main types from a geological standpoint. The exploration of mineral resources is also treated, including geophysical methods of exploration, borehole geophysical logging, geochemical methods, drilling methods, and mineral deposit models in exploration. Further, the book addresses the evaluation of mineral resources, from sampling techniques to the economic evaluation of mining projects (i.e. types and density of sampling, mean grade definition and calculation, Sichel's estimator, evaluation methods – classical and geostatistical, economic evaluation – NPV, IRR, and PP, estimation of risk, and software for evaluating mineral resources). It subsequently describes key mineral resource exploitation methods (open pit and underground mining) and the mineral processing required to obtain saleable products (crushing, grinding, sizing, ore separation, and concentrate dewatering, also with some text devoted to tailings dams). Lastly, the book discusses the environmental impact of mining, covering all the aspects of this very important topic, from the

description of diverse impacts to the environmental impact assessment (EIA), which is essential in modern mining projects.

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

Remote Sensing and Mineral Exploration contains the proceedings of the international workshop on remote sensing and mineral exploration, held in Bangalore, India in June 1979. The compendium is comprised of papers presented at the workshop and reflects the state of remote sensing in the field of geology and exploration for mineral and energy resources. The two-day conference serves as a platform for geologists and other experts in related fields to share experiences and research studies on the use of satellites and other remote sensing techniques in geologic mapping and mineral and energy exploration. Topics presented include, contributions of LANDSAT data to the geological survey of India; characteristics of the LANDSAT system and data for geologic applications; application of remote sensing techniques to petroleum exploration; and an automatic method of discriminating rock outcrops using LANDSAT data. Geologists, petroleum and mineral exploration experts, and researchers will find this book an interesting reading material.

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](http://www.blackwellpublishing.com/robb).

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.

The rich palette of topics set out in this book provides a sufficiently broad overview of the developments in the field of quality control. By providing detailed information on various aspects of quality control, this book can serve as a basis for starting interdisciplinary cooperation, which has increasingly become an integral part of scientific and applied research.

Geographic Information Systems for Geoscientists: Modelling with GIS provides an introduction to the ideas and practice of GIS to students and professionals from a variety of geoscience backgrounds. The emphasis in the book is to show how spatial data from various sources (principally paper maps, digital images and tabular data from point samples) can be captured in a GIS database, manipulated, and transformed to extract particular features in the data, and combined together to produce new derived maps, that are useful for decision-making and for understanding spatial interrelationship. The book begins by defining the meaning, purpose, and functions of GIS. It then illustrates a typical GIS application. Subsequent chapters discuss methods for organizing spatial data in a GIS; data input and data visualization; transformation of spatial data from one data structure to another; and the combination, analysis, and modeling of maps in both raster and vector formats. This book is intended as both a textbook for a course on GIS, and also for those professional geoscientists who wish to understand something about the subject. Readers with a mathematical bent will get more out of the later chapters, but relatively non-numerate individuals will understand the general purpose and approach, and will be able to apply methods of map modeling to clearly-defined problems.

For any country's economy, mineral resources form an important part in generating revenue and increasing its GDP. Therefore, learning the economics behind mines and minerals becomes mandatory and logical. This book investigates and promotes understanding of economic and policy issues, programmes and strategies for exploration, mining, beneficiation and marketing activities. Divided into ten chapters, the book puts emphasis on elaborating the principles of mine and mineral economics. The introductory chapter discusses the scope of the subject and the issues addressed by it. Outline of reserve-resource dynamics and the recent approaches towards estimating ore-reserves are then elaborated, followed by a discussion on mineral availability. Focus is then shifted to more technical and quantitative aspects of mineral sampling. Issues relating to mineral property evaluation and project feasibility assessment are then taken up. Both quantitative and logical aspects of mine finance and accounting have been discussed. Nitty-gritties of mine taxation are further outlined and the reader is introduced to aspects relating to marketing and trading of minerals. Distinctive features of the mineral policies of a few countries are highlighted while discussing the characteristic features of a national mineral policy. The last chapter of this book is on mineral industry and the environment.

Techniques of performing applied mineralogy investigations, and applications and capabilities of recently developed instruments for measuring mineral properties are explored in this book intended for practicing applied mineralogists, students in mineralogy and metallurgy, and mineral processing engineers. The benefits of applied mineralogy are presented by using in-depth applied mineralogy studies on base metal ores, gold ores, porphyry copper ores, iron ores and industrial minerals as examples. The chapter on base metal ores includes a discussion on the effects of liberation, particle sizes and surfaces coatings of Pb, Cu, Fe, Ca and  $SO_4^{2-}$  on the recoveries of sphalerite, galena and chalcopyrite. The chapter on gold discusses various methods of determining the quantities of gold in different minerals, including 'invisible' gold in pyrite and arsenopyrite, so that a balance of the distribution of gold among the minerals can be calculated. This book also discusses the roles of pyrite, oxygen, moisture and bacterial (thiobacillus ferrooxidans) on reactions that produce acidic drainage from tailings piles, and summarizes currently used and proposed methods of remediation of acidic drainage.

Annotation Comprehensive reference examines all aspects of mineral processing from the handling of raw materials to separation strategies to the remediation of waste products. Shows how developments in engrg., chemistry, computer science, and environmental science contribute to the ultimate goal of producing minerals and metals economically from ores.

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