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WHITAKER KIRSTEN

Pegmatites of the Crystal Mountain

District, Larimer County, Colorado
Elsevier
The integration of Tectonics/Geochemistry, up-to-date reviews by leading scientists as well as a broad topical coverage of the Archean, are some of the features of this particular volume. As geochronology has progressed in the last 20 years, the Archean has continued to attract interest. Advancements in the understanding of Archean crustal and mantle evolution have progressed rapidly since the first International Archean Symposium in Western Australia (1970). The landmark for the Archean was the NATO Advanced Study Institute at Leicester (1975). At this meeting the Archean truly "came of age". Investigators from many different disciplines focused their expertise on the early history of the earth. For the first time, the nature of the atmosphere, oceans, and life during the Archean was an important part of an Archean symposium. During the most recent Archean Symposium in Perth in 1990, there was a shift in interest from field and trace element data to the new rapidly evolving high-precision U/Pb geochronology of Archean rocks and to detailed structural studies of both low and high grade Archean terrains. The terrane concept so widely applied to the Phanerozoic was proposed for the Archean Yilgarn Province in Western Australia and is now widely accepted for the Archean (as evident by the articles in this book). Plate tectonics is now widely accepted as the principal process that

controls the history of continents and oceans. There are, though, well substantiated differences between Archean and post-Archean rocks that indicate that Archean tectonic regimes must have differed in some respects from modern ones. The question of how and to what degree did Archean plate tectonics differ from modern plate tectonics is treated in many of the chapters of this book. Altogether, the editor has presented a selection of articles that provide a fascinating insight into the latest observations in this field.

The Precambrian Earth John Wiley & Sons

Volume 50 of Reviews in Mineralogy and Geochemistry treats Beryllium and its cosmogenic isotopes. This volume includes an overview of Be studies in the earth sciences and a systematic classification of Be minerals based on their crystal structure. It treats the analysis of these minerals by the secondary ion mass spectroscopy as well as experimental studies of systems involving Be. Moreover, this volume reviews the behavior of Be in the Solar System, with an emphasis on meteorites, the Moon and Mars, and the implications of this behavior for the evolution of the solar system. It gives an overview of the terrestrial geochemistry of Be and discusses the contamination of the environment by this anthropogenic toxin. It reports use of the longer lived Be-10 to assess erosion rates and other surficial processes and how this isotope can yield independent temporal records of geomagnetic field variations for

comparison with records obtained by measuring natural remnant magnetization, be a chemical tracer for processes in convergent margins, and can date events in Cenozoic tectonics. It reviews applications of the shorter lived isotope Be-7 in environmental studies as well. Residual phases include acidic plutonic and volcanic rocks, whose geochemistry and evolution are covered, while granitic pegmatites, which are well-known for their remarkable, if localized, Be enrichments and a wide variety of Be mineral assemblages, are reviewed. Not all Be concentrations have obvious magmatic affinities; for example, one class of emerald deposits results from Be being introduced by heated brines. Pelitic rocks are an important reservoir of Be in the Earth's crust and their metamorphism plays a critical role in recycling of Be in subduction zones, eventually, anatectic processes complete the cycle, providing a source of Be for granitic rocks.

Mineralogy And Geology of Rare Earths in China John Wiley & Sons

Mankind is using a greater variety of metals in greater quantities than ever before. As a result there is increasing global concern over the long-term availability of secure and adequate supplies of the metals needed by society. Critical metals, which are those of growing economic importance that might be susceptible to future scarcity, are a particular worry. For many of these we have little information on how they are concentrated in the Earth’s crust, how to extract them from their ores, and

how to use, recycle and dispose of them effectively and safely. Published with the British Geological Survey, the Critical Metals Handbook brings together a wealth of knowledge on critical metals and provides a foundation for improving the future security and sustainability of critical metal supplies. Written by international experts, it provides a unique source of authoritative information on diverse aspects of the critical metals, including geology, deposits, processing, applications, recycling, environmental issues and markets. It is aimed at a broad non-specialist audience, including professionals and academics working in the exploration and mining sectors, in mining finance and investment, and in mineral processing and manufacturing. It will also be a valuable reference for policy makers concerned with resource management, land-use planning, eco-efficiency, recycling and related fields.

Rare Earth and Critical Elements in Ore Deposits Springer Science & Business Media

Metallic resources play a huge role in many fields: in the energy transition, the development of new technologies and the production and storage of green energy. Metallic Resources 2 presents various studies in notable metallogenic regions or deposits worldwide that enable us to tackle the question of the concentration of metals, especially strategic metals, in various geodynamic settings. An understanding of the geological processes that lead to the formation of deposits and influence their

concentrations in the Earth's crust is of the utmost importance when it comes to uncovering new mineral resources. This book puts forward various different methodological approaches necessary in the study of deposits of metallic resources, from field observations to microanalysis. A study of specific geo-politico-economic frameworks is also presented.

Crustal Evolution and Metallogeny in India Elsevier

Earth’s Oldest Rocks provides a comprehensive overview of all aspects of early Earth, from planetary accretion through to development of protocratons with depleted lithospheric keels by c. 3.2 Ga, in a series of papers written by over 50 of the world's leading experts. The book is divided into two chapters on early Earth history, ten chapters on the geology of specific cratons, and two chapters on early Earth analogues and the tectonic framework of early Earth. Individual contributions address topics that range from planetary accretion, a review of Earth meteorites, significance and composition of Hadean protocrust, composition of Archaean mantle and deep crust, all aspects of the geology of Paleoarchean cratons, composition of Archean oceans and hydrothermal environments, evidence and geological settings of early life, early Earth analogues from Venus and New Zealand, and a tectonic framework for early Earth. * Contains comprehensive reviews of areas of ancient lithosphere on Earth, of planetary accretion processes, and of meteorites * Focuses on specific aspects

of early Earth, including oldest putative life forms, evidence of the composition of the ancient atmosphere-hydrosphere, and the oldest evidence for subduction-accretion * Presents an overview of geological processes and model of the tectonic framework on early Earth

Rare-element Geochemistry and Mineral Deposits John Wiley & Sons

This book is the first contribution to the overview of Precambrian geology of China. It covers Precambrian geology of the North China Craton, the South China Craton and the Tarim Craton, as well as other smaller blocks in the Chinese orogenic belts. It provides systematic concepts of the Chinese paleo-continents and incorporates the most up-to-date achievements. Edited by many of the active researchers working at the forefront of the related fields, it contributes greatly to the international Precambrian geology community and would be of interest to geoscientists working in the research field of geology of China and Precambrian geodynamics.

Rock-forming Minerals St. John's, N.L. : Geological Association of Canada

Encyclopedia of Geology, Second Edition presents in six volumes state-of-the-art reviews on the various aspects of geologic research, all of which have moved on considerably since the writing of the first edition. New areas of discussion include extinctions, origins of life, plate tectonics and its influence on faunal provinces, new types of mineral and hydrocarbon deposits, new methods of dating rocks, and geological processes. Users will find this to be a

fundamental resource for teachers and students of geology, as well as researchers and non-geology professionals seeking up-to-date reviews of geologic research. Provides a comprehensive and accessible one-stop shop for information on the subject of geology, explaining methodologies and technical jargon used in the field Highlights connections between geology and other physical and biological sciences, tackling research problems that span multiple fields Fills a critical gap of information in a field that has seen significant progress in past years Presents an ideal reference for a wide range of scientists in earth and environmental areas of study

Archean Crustal Evolution Geological Society of London

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.

Mineral Systems, Earth Evolution, and Global Metallogeny Springer

Accompanying CD-ROM contains all illustrations of volume and PDF of chapters of "Graranitic pegmatites, short course handbook 7" published in 1982, edited by Petr Černý, P.

Geology of the Pegmatites and Associated Rocks of Maine Springer Nature

The Joint 6th Biennial SGA-SEG Meeting was held in Krakow in August 2001. This volume contains 274 extended abstracts, grouped thematically under 18 session titles covering topics such as lead-zinc deposits; metamorphism affecting mineral deposits; and the environmental aspects of mining.

Archean Evolution of the Pilbara Craton and Fortescue Basin VSP

Crustal evolution means the resultant changes that the Earth's crust has gone through in its geologic past affected by changes in the mantle-crust system, the atmosphere, the hydrosphere and the

biosphere. Metallogeny is the genesis of metallic mineral deposits. Both the terms are used in the book in their conventional sense, but keeping in mind an Indian context. This book is the first of its kind to document in detail the nature, origin and evolution of mineral deposits in India and is contextualized in local, regional and global geology. The book is unique in that it combines both metallogeny and crustal evolution that were hitherto treated as stand-alone topics. The exhaustive chapters in the book carry detailed case studies of the distribution and occurrence of ores. The book would be useful to students of advanced geology, researchers, teachers, planners and global metallogeneticists around the world.
Metallic Resources 2 Walter de Gruyter GmbH & Co KG
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.
Beryllium Geological Society of America
In this book the editors strive to cover all primary (i.e. non-applied) topics in Precambrian geology in a non-partisan

way, by using a large team of international authors to present their datasets and highly divergent viewpoints. The chapters address: celestial origins of Earth and succeeding extraterrestrial impact events; generation of continental crust and the greenstone-granite debate; the interaction of mantle plumes and plate tectonics over Precambrian time; Precambrian volcanism, emphasising komatiite research; evolution and models for Earth's hydrosphere and atmosphere; evolution of life and its influence on Precambrian ocean chemistry and chemical sedimentation; sedimentation through Precambrian time; the application of sequence stratigraphy to the Precambrian rock record. Each topic is introduced and a non-partisan closing commentary provided at the end of each chapter. The final chapter blends the major geological events and rates at which important processes occurred into a synthesis, which postulates a number of "event clusters" in the Precambrian when significant changes occurred in many natural systems and geological environments. Also available in paperback, ISBN: 0-444-51509-7

Archean Granitoids of India: Windows into Early Earth Tectonics CRC Press

This book provides a comprehensive overview of the evolution of one of the oldest and best-exposed Archaean cratons on this planet. There is currently a renewed interest in the early Earth, and the Kaapvaal craton has long served as a model for early crustal evolution.

This unique multidisciplinary resource features information on geology, tectonics, geochemistry, and geochronology. It offers a wealth of new data on various aspects of the craton as well as contributions on the various crustal units by international specialists.

Mineral Deposits at the Beginning of the 21st Century Geological Survey

As the importance and dependence of specific mineral commodities increase, so does concern about their supply. The United States is currently 100 percent reliant on foreign sources for 20 mineral commodities and imports the majority of its supply of more than 50 mineral commodities. Mineral commodities that have important uses and face potential supply disruption are critical to American economic and national security. However, a mineral commodity's importance and the nature of its supply chain can change with time; a mineral commodity that may not have been considered critical 25 years ago may be critical today, and one considered critical today may not be so in the future. The U.S. Geological Survey has produced this volume to describe a select group of mineral commodities currently critical to our economy and security. For each mineral commodity covered, the authors provide a comprehensive look at (1) the commodity's use; (2) the geology and global distribution of the mineral deposit types that account for the present and possible future supply of the commodity; (3) the current status of production, reserves, and resources in the United States and globally; and (4)

environmental considerations related to the commodity's production from different types of mineral deposits. The volume describes U.S. critical mineral resources in a global context, for no country can be self-sufficient for all its mineral commodity needs, and the United States will always rely on global mineral commodity supply chains. This volume provides the scientific understanding of critical mineral resources required for informed decisionmaking by those responsible for ensuring that the United States has a secure and sustainable supply of mineral commodities.

Boron Isotopes Springer

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

Critical Mineral Resources of the United States Springer
Granitoids form the bulk of the Archean continental crust and preserve key information on early Earth evolution. India hosts five main Archean cratonic blocks (Aravalli, Bundelkhand, Singhbhum, Bastar and Dharwar). This book summarizes the available information on Archean granitoids of Indian cratons. The chapters cover a broad spectrum of themes related to granitoid typology, emplacement mechanism, petrogenesis, phase-equilibria modelling, temporal distribution, tectonic setting, and their roles in fluid evolution, metal delivery and mineralizations. The book presents a broader picture incorporating regional- to craton-scale comparisons, implications for Archean geodynamic processes, and temporal changes thereof. This synthesis work, integrating modern concepts on granite petrology and crustal evolution, offers an irreplaceable body of reference information for any geologist interested in Archaean Indian granitoids.
Ore-bearing Granite Systems Elsevier
During the last decade, software developments in Scanning Electron Microscopy (SEM) provoked a notable increase of applications to the study of solid matter. The mineral liberation analysis (MLA) of processed metal ores was an important drive for innovations that led to QEMSCAN, MLA and other software platforms. These combine the assessment of the backscattered electron (BSE) image to the directed

steering of the electron beam for energy dispersive spectroscopy (EDS) to automated mineralogy. However, despite a wide distribution of SEM instruments in material research and industry, the potential of SEM automated mineralogy is still under-utilised. The characterisation of primary ores, and the optimisation of comminution, flotation, mineral concentration and metallurgical processes in the mining industry by generating quantified data, is still the major application field of SEM automated mineralogy. However, there is interesting potential beyond these classical fields of geometallurgy and metal ore fingerprinting. Slags, pottery and artefacts can be studied in an archeological context for the recognition of provenance and trade pathways; soil, and solid particles of all kinds, are objects in forensic science. SEM automated mineralogy allows new insight in the fields of process chemistry and recycling technology.

Earth's Oldest Rocks Cambridge University Press

Lithium-cesium-tantalum (LCT) pegmatites are important resources for rare metals. For Cs, only the LCT pegmatites with the zeolite group mineral pollucite at Bikita (Zimbabwe Craton) and Tanco (Superior Province Craton) are of commercial importance. Common characteristics of world-class LCT pegmatite deposits include their Meso- to Neoarchean age and geological setting within greenstone belt lithologies on Archean Cratons. This study presents the first coherent and comparative

scientific investigation of five major LCT pegmatite systems from the Yilgarn, Pilbara and Zimbabwe Craton. For the evaluation of their Cs potential and of the genetic concepts of pollucite formation, the pegmatites from Wodgina, Londonderry, Mount Deans and Cattlin Creek were compared to the Bikita pollucite mineralization. The integration of the new data (e.g., geochronological and radiogenic isotope data) into the complex geological framework: 1) enhances our knowledge of the formation of LCT pegmatite systems, and 2) will contribute to the further exploration of additional world-class LCT pegmatite deposits, which 3) may host massive pollucite mineralisations.

Scientific Investigations Report

Geological Society of London

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.