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## KEY=OF - KAMREN FIELDS

### IGNEOUS AND METAMORPHIC PETROLOGY

*John Wiley & Sons* Igneous and metamorphic petrology has over the last twenty years expanded rapidly into a broad, multifaceted and increasingly quantitative science. Advances in geochemistry, geochronology, and geophysics, as well as the appearance of new analytical tools, have all contributed to new ways of thinking about the origin and evolution of magmas, and the processes driving metamorphism. This book is designed to give students a balanced and comprehensive coverage of these new advances, as well as a firm grounding in the classical aspects of igneous and metamorphic petrology. The emphasis throughout is on the processes controlling petrogenesis, but care is taken to present the important descriptive information so crucial to interpretation. One of the most up-to-date synthesis of igneous and metamorphic petrology available. Emphasis throughout on latest experimental and field data. Igneous and metamorphic sections can be used independently if necessary.

### ESSENTIALS OF IGNEOUS AND METAMORPHIC PETROLOGY

*Cambridge University Press* A concise introduction to the mineralogy and petrology of igneous and metamorphic rocks for all Earth Science students.

### PRINCIPLES OF IGNEOUS AND METAMORPHIC PETROLOGY

### PRINCIPLES OF IGNEOUS AND METAMORPHIC PETROLOGY

*Cambridge University Press* This textbook provides a basic understanding of the formative processes of igneous and metamorphic rock through quantitative applications of simple physical and chemical principles. The book encourages a deeper comprehension of the subject by explaining the petrologic principles rather than simply presenting the student with petrologic facts and terminology. Assuming knowledge of only introductory college-level courses in physics, chemistry, and calculus, it lucidly outlines mathematical derivations fully and at an elementary level, and is ideal for intermediate and advanced courses in igneous and metamorphic petrology. The end-of-chapter quantitative problem sets facilitate student learning by working through simple applications. They also introduce several widely-used thermodynamic software programs for calculating igneous and metamorphic phase equilibria and image analysis software. With over 350 illustrations, this revised edition contains valuable new material on the structure of the Earth's mantle and core, the properties and behaviour of magmas, recent results from satellite imaging, and more.

### PETROLOGY

### THE STUDY OF IGNEOUS, SEDIMENTARY AND METAMORPHIC ROCKS

*Waveland PressInc*

### PRINCIPLES OF IGNEOUS AND METAMORPHIC PETROLOGY

*Pearson Higher Ed* This is the eBook of the printed book and may not include any media, website access codes, or print supplements that may come packaged with the bound book. For a combined, one-semester, junior/senior-level course in Igneous and Metamorphic Petrology. Also useful for programs that teach Igneous Petrology and Metamorphic Petrology. Typical texts on igneous and metamorphic petrology are geared to either advanced or novice petrology students. This unique text offers comprehensive, up-to-date coverage of both igneous and metamorphic petrology in a single volume-and provides the quantitative and technical background required to critically evaluate igneous and metamorphic phenomena in a way that students at all levels can understand. The goal throughout is for students to be able to apply the techniques-and enjoy the insights of the results-rather than tinker with theory and develop everything from first principles.

### EARTH MATERIALS

### INTRODUCTION TO MINERALOGY AND PETROLOGY

*Cambridge University Press* Key concepts in mineralogy and petrology are explained alongside beautiful full-color illustrations, in this concisely written textbook.

### PRINCIPLES OF IGNEOUS AND METAMORPHIC PETROLOGY

*Cambridge University Press* A textbook providing a quantitative approach to the petrologic principles of igneous and metamorphic rocks in a new edition.

### PETROLOGY OF IGNEOUS AND METAMORPHIC ROCKS

*McGraw-Hill Science, Engineering & Mathematics*

### ESSENTIALS OF IGNEOUS AND METAMORPHIC PETROLOGY

*Cambridge University Press* Concise introductory textbook on the petrology of igneous and metamorphic rocks for one-semester courses. Topics are organized around the types of rocks to expect in tectonic environments, rather than around rock classifications. Application boxes engage students by showing how petrology connects to wider aspects of geology. Includes end-of-chapter exercises.

### AN INTRODUCTION TO METAMORPHIC PETROLOGY

### INTRODUCTION TO MINERALOGY AND PETROLOGY

*Elsevier* 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

### PETROLOGY

### PRINCIPLES AND PRACTICE

*Springer Science & Business Media* This undergraduate textbook on the key subject of geology closely follows the core curriculum adopted by most universities throughout the world and is a must for every geology student. It covers all aspects of petrology, including not only the principles of petrology but also applications to the origin, composition, and field relationships of rocks. Although petrology is commonly taught in the junior year, this book is a useful resource for graduate students as well.

### PETROLOGY

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## THE STUDY OF IGNEOUS, SEDIMENTARY AND METAMORPHIC ROCKS

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Designed for the middle-level undergraduate geology major, this text incorporates both fundamentals and information on advances in our understanding of igneous, sedimentary, and metamorphic rocks. It provides an overview of the field of petrology and a foundation for advanced studies.

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## PETROGRAPHY OF IGNEOUS AND METAMORPHIC ROCKS

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*Waveland Press Inc* A laboratory manual for introductory courses in optical mineralogy. The illustrations are bandw, but available in color on a video cassette from the author. Annotation copyrighted by Book News, Inc., Portland, OR

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## A PRACTICAL GUIDE TO ROCK MICROSTRUCTURE

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*Cambridge University Press* Essential reading for undergraduate and graduate students of petrology and structural geology.

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## ESSENTIALS OF IGNEOUS AND METAMORPHIC PETROLOGY

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*Cambridge University Press* All Earth Science students need to understand the origins, environments, and basic processes that produce igneous and metamorphic rocks. This concise introductory textbook provides students with the essential knowledge needed to understand how petrology relates to other topics in the geologic sciences, and has been written specifically for one-semester courses. Throughout, the emphasis is on interpreting the mineralogy and petrology of rock suites in terms of origin and environment, with the first half of the book concentrating on igneous rocks, and the second half on metamorphic rocks. This Second Edition has been thoroughly revised and brought completely up-to-date. It now includes a new chapter on the application of stable and radiogenic isotopes in petrology, introducing students to the concept of isotopic fractionation and describing the process of radioactive decay. The discussions of phase diagrams, connections between igneous and metamorphic rock suites, and convergent margin magmatism have also been expanded. There is a new glossary of terms, updated end-of-chapter exercises, and updated further readings.

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## PRINCIPLES OF IGNEOUS AND METAMORPHIC PETROLOGY

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*Cambridge University Press* Fully updated new edition features a new introductory chapter and more end-of-chapter questions, guiding students to a mastery of petrology.

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## THE FIELD DESCRIPTION OF IGNEOUS ROCKS

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*John Wiley & Sons* The Second Edition of this unique pocket field guide has been thoroughly revised and updated to include advances in physical volcanology, emplacement of magmas and interpreting structures and textures in igneous rocks. The book integrates new field based techniques (AMS and geophysical studies of pluton shape) with new topics on magma mixing and mingling, sill emplacement and magma sediment interaction. Part of the successful Field Guide series, this book includes revised sections on granitic and basaltic rocks and for the first time a new chapter on the engineering properties of igneous rocks. The Geological Field Guide Series is specifically designed for scientists and students to use in the field when information and resources may be more difficult to access. Many editions have been updated for 2011 and the guides are: Student-friendly in design and cost Durable Lightweight Pocket-sized Reliable Concise Visit the series homepage at [www.wiley.com/go/geologicalfield](http://www.wiley.com/go/geologicalfield)

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## PETROLOGY OF THE METAMORPHIC ROCKS

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*Springer Science & Business Media* There has been a great advance in the understanding of processes of meta morphism and of metamorphic rocks since the last edition of this book appeared. Methods for determining temperatures and pressures have become almost routine, and there is a wide appreciation that there is not a single temperature and pressure of metamorphism, but that rocks may preserve, in their minerals, chemistry and textures, traces of their history of burial, heating, deformation and permeation by fluids. However, this exciting new knowledge is still often difficult for non-specialists to understand, and this book, like the first edition, aims at enlightenment. I have concentrated on the interpretation of the plate tectonic settings of metamorphism, rather than following a geochemical approach. Although there is an impressive degree of agreement between the two, I believe that attempting to discover the tectonic conditions accompanying rock recrystallization will more readily arouse the interest of the beginner. I have used a series of case histories, as in the first edition, drawing on my own direct experience as far as possible. This m

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## INTRODUCTION TO METAMORPHIC TEXTURES AND MICROSTRUCTURES

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*Psychology Press* An introduction to the thin section description and interpretation of metamorphic rocks, their textures, and microstructures, for advanced undergraduate and graduate geology students. Sections cover some of the broader aspects of metamorphism and metamorphic rocks, the basics of description and interpretation of the textural/microstructural features from the simplest to the more complex, and advanced interpretations in polydeformed and polymetamorphosed rocks. Also available in paper (02414-2), \$29.95. Annotation copyrighted by Book News, Inc., Portland, OR

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## PRINCIPLES OF METAMORPHIC PETROLOGY

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*Cambridge University Press* This book offers a complete introduction to the study of metamorphic rocks.

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## ROCK FORMING MINERALS

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## LAYERED SILICATES EXCLUDING MICAS AND CLAY MINERALS, VOLUME 3B

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*Geological Society of London* This extensive revision deals with the minerals talc, pyrophyllite, chlorite, serpentine, stilpnomelane, zussmanite, prehnite and apophyllite. The text has been completely rewritten and very much expanded to take account of the many advances that have been made in all aspects of the Earth sciences, not least mineralogy. Each chapter is headed by a brief tabulation of mineral data and ends with full references. Crystal structures are described and illustrated, followed by discussion of structural information gained from spectroscopic as well as X-ray and electron-optic methods. Chemical sections include many analyses and structural formulae, phase relations, igneous, metamorphic and sedimentary geochemistry, alteration and weathering. Examples are given of a range of mineral parageneses. Correlation between the various aspects of mineralogy are emphasized in order to provide a scientific understanding of minerals as well as their description and identification. So great has been the expansion of research on layered silicates that a separate volume (3A, 2003) was devoted entirely to micas and another (3C), entirely for clay minerals will also be published. Rock-Forming Minerals is an essential reference work for professionals, researchers and postgraduate students in Earth science and related fields in chemistry, physics, engineering, environmental and soil sciences.

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## MINERALS

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## THEIR CONSTITUTION AND ORIGIN

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*Cambridge University Press* The new edition of this popular textbook, once again, provides an indispensable guide for the next generation of mineralogists. Designed for use on one- or two-semester courses, this second edition has been thoughtfully reorganised, making it more accessible to students, whilst still being suitable for an advanced mineralogy course. Additions include expanded introductions to many chapters, a new introductory chapter on crystal chemistry, revised figures, and an extended plates section containing beautiful colour photographs. Text boxes include historical background and case studies to engage students, and end-of-chapter questions help them reinforce concepts. With new online resources to support learning and teaching, including laboratory exercises, PowerPoint slides, useful web links and mineral identification tables, this is a sound investment for students in the fields of geology, materials science and environmental science, and a valuable reference for researchers, collectors and anyone interested in minerals.

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## AN INTRODUCTION TO IGNEOUS AND METAMORPHIC PETROLOGY

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Providing enough background to be rigorous, "without" being exhaustive, it gives readers good preparation in the techniques of modern petrology; a clear and organized review of the classification, textures, and approach to petrologic study; and then applies these concepts to the real occurrences of the rocks themselves. Requires only a working knowledge of algebra, and makes extensive use of spreadsheets. Includes an accompanying diskette of programs and data files. This book offers unique, comprehensive, up-to-date coverage of both igneous "and" metamorphic petrology "in a single volume" and provides the quantitative and technical background required to critically evaluate igneous and metamorphic phenomena. For anyone interested in petrology.

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## IGNEOUS PETROLOGY

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*Wiley-Blackwell* Igneous Petrology provides up-to-date, integrated, comprehensive coverage of physical and chemical facets of magmatic rocks and magma systems. Field relations and fabrics of rocks together with their mineralogical, chemical and isotopic compositions facilitate interpretation of rock origin. The dynamic evolution of magma systems is considered from thermodynamics and from their chemical, physical and kinetic properties. Sources of magmas and how they are generated and subsequently evolve are considered in the context of global tectonics. The textbook stresses petrologic processes while also providing thorough descriptions of rock products suitable for the undergraduate student. Organized in terms of chemical and physical phenomena. Includes new insights into intrusive and volcanic processes-especially, explosive volcanism in field petrology. Contains new data in physical petrology. Focuses on the latest research of magma properties and experimental and theoretical modeling. Consists of new coverage of trace element characterization of rock associations and modeling. Well illustrated text with a 6-page, 4-color insert. For ease of use, the quantitative material is set aside in boxes and in certain chapters. Features "Fundamental questions considered in the chapter" which provide a brief, chapter preview. "Critical thinking questions" allow the students to expand their command of the subject. Contains a comprehensive glossary along with a list of cited references. Additional problem sets will be available on the web.

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## EARTH MATERIALS

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Cambridge University Press Designed specifically for one-semester courses, this beautifully illustrated textbook explains the key concepts in mineralogy and petrology.

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### SEDIMENTOLOGY AND STRATIGRAPHY

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John Wiley & Sons This fully revised and updated edition introduces the reader to sedimentology and stratigraphic principles, and provides tools for the interpretation of sediments and sedimentary rocks. The processes of formation, transport and deposition of sediment are considered and then applied to develop conceptual models for the full range of sedimentary environments, from deserts to deep seas and reefs to rivers. Different approaches to using stratigraphic principles to date and correlate strata are also considered, in order to provide a comprehensive introduction to all aspects of sedimentology and stratigraphy. The text and figures are designed to be accessible to anyone completely new to the subject, and all of the illustrative material is provided in an accompanying CD-ROM. High-resolution versions of these images can also be downloaded from the companion website for this book at: [www.wiley.com/go/nicholssedimentology](http://www.wiley.com/go/nicholssedimentology).

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### IGNEOUS ROCKS AND PROCESSES

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#### A PRACTICAL GUIDE

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John Wiley & Sons This book is for geoscience students taking introductory or intermediate-level courses in igneous petrology, to help develop key skills (and confidence) in identifying igneous minerals, interpreting and allocating appropriate names to unknown rocks presented to them. The book thus serves, uniquely, both as a conventional course text and as a practical laboratory manual. Following an introduction reviewing igneous nomenclature, each chapter addresses a specific compositional category of magmatic rocks, covering definition, mineralogy, eruption/ emplacement processes, textures and crystallization processes, geotectonic distribution, geochemistry, and aspects of magma genesis. One chapter is devoted to phase equilibrium experiments and magma evolution; another introduces pyroclastic volcanology. Each chapter concludes with exercises, with the answers being provided at the end of the book. Appendices provide a summary of techniques and optical data for microscope mineral identification, an introduction to petrographic calculations, a glossary of petrological terms, and a list of symbols and units. The book is richly illustrated with line drawings, monochrome pictures and colour plates. Additional resources for this book can be found at: <http://www.wiley.com/go/gill/igneous>.

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### PETROLOGY OF SEDIMENTARY ROCKS

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Cambridge University Press Advanced textbook outlining the physical, chemical, and biological properties of sedimentary rocks through petrographic microscopy, geochemical techniques, and field study.

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### APPLIED SEDIMENTOLOGY

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Elsevier There are three types of rock—igneous, metamorphic and sedimentary. Sedimentary rocks form from the weathering, erosion, transportation and deposition of older rocks. Applied Sedimentology describes the formation, transportation and deposition of sediment, and the post-depositional processes that change soft sediment into sedimentary rock. Sedimentary rocks include sandstones, limestones and mudstones. All the world's coal, most of its water and fossil fuels, and many mineral deposits occur in sedimentary rocks. Applied Sedimentology shows how the study of sediments aids the exploration for and exploitation of natural resources, including water, ores and hydrocarbons. \* Completely revised edition; Like its precursor, it describes sediments from sand grains to sedimentary basins; Features up-to date account and critique of sequence and cyclostratigraphy \* Extensively illustrated with photos and remotely sensed sea bed images describing sedimentary processes, products and depositional systems; Color plates illustrate sediment textures, lithologies, pore types, diagenetic textures, and carbonate and clastic sequence stratigraphic models \* Emphasises the applications of sedimentology to the exploration for and exploitation of natural resources, including water, ores and hydrocarbons \* Extensive references and up-to-date bibliography for further study

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### GEOCHRONOLOGY AND THERMOCHRONOLOGY BY THE 40AR/39AR METHOD

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Oxford University Press on Demand Argon isotopic dating is one of the most important techniques for estimating the ages of rocks and can be used on very small samples. It has been used to assign reliable ages to the Earth and numerous meteorites. This second edition covers the standard principles and methods and incorporates many of new developments from the last decade. It covers the basis of the method, technical aspects, data presentation, diffusion theory, thermochronology, and many applications and case studies.

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### ESSENTIALS OF IGNEOUS AND METAMORPHIC PETROLOGY

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Cambridge University Press All geoscience students need to understand the origins, environments and basic processes that produce igneous and metamorphic rocks. This concise textbook, written specifically for one-semester undergraduate courses, provides students with the key information they need to understand these processes. Topics are organized around the types of rocks to expect in a given tectonic environment, rather than around rock classifications: this is much more interesting and engaging for students, as it applies petrology to real geologic environments. This textbook includes over 250 illustrations and photos, and is supplemented by additional color photomicrographs made freely available online. Application boxes throughout the text encourage students to consider how petrology connects to wider aspects of geology, including economic geology, geologic hazards and geophysics. End-of-chapter exercises allow students to apply the concepts they have learnt and practice interpreting petrologic data.

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### SEDIMENTOLOGY AND SEDIMENTARY BASINS

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#### FROM TURBULENCE TO TECTONICS

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John Wiley & Sons Sedimentology is a core discipline of earth and environmental sciences. It enquires the origins, transport and deposition of mineral sediment on the Earth's surface. The subject is a link between positive effects arising from the building of relief by tectonics and the negative action of denudation in drainage catchments and tectonic subsidence in sedimentary basins. The author addresses the principles of the subject, emphasising the advantages of a general science approach and the importance of understanding modern processes. Sedimentology and Sedimentary Basins is not an encyclopaedia, but attempts to stimulate interdisciplinary thought across the whole subject area and related disciplines. The book has been designed to meet the needs of earth and environmental science undergraduates.

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### GEOLOGY- VOLUME II

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EOLSS Publications Geology is the Component of Encyclopedia of Earth and Atmospheric Sciences, in the global Encyclopedia of Life Support Systems (EOLSS), which is an integrated compendium of twenty Encyclopedias. The theme on geology in the Encyclopedia of Earth and Atmospheric Sciences, presents many aspects of geology under the following nine different topics: The Organized Earth.; Tectonics and Geodynamics; Igneous and Metamorphic Petrology; Sedimentary Geology and Paleontology; Overview of the Mineralogical Sciences; Geology of Metallic and Non-Metallic Mineral Resources; Regional Geology; Geology of Petroleum, Gas, and Coal; Environmental and Engineering Geology.

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### EARTH MATERIALS 2ND EDITION

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#### INTRODUCTION TO MINERALOGY AND PETROLOGY

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Cambridge University Press This concise, accessible, market-leading textbook brings together the wide-ranging fundamentals students need to understand rocks and minerals, and shows them how they relate to the broader Earth, materials and environmental sciences. Designed specifically for one-semester courses, it is beautifully illustrated to explain the key concepts in mineralogy and petrology. This edition has been fully updated based on classroom experience, and new features include a completely new chapter providing an elementary introduction to thermodynamics, kinetics, radioactive decay and absolute dating; new mineral descriptions and many new stunning color photographs; and a new section on hydraulic fracturing and discussion of some of its most serious potential environmental consequences. The book uses stunning photos of mineral specimens and rock thin sections to help students build a core understanding. It also creates a highly effective learning experience through close integration of clear illustrations with engaging text, and helps students to easily visualize crystal structures through the CrystalViewer's 3D software, available online.

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### THE PRINCIPLES OF PETROLOGY

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#### AN INTRODUCTION TO THE SCIENCE OF ROCKS

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Springer Science & Business Media In this book the task of summarising modern petrology from the genetic standpoint has been attempted. The scale of the work is small as compared with the magnitude of its subject, but it is nevertheless believed that the field has been reasonably covered. In conformity with the genetic viewpoint petrology, as contrasted with petrography, has been emphasised throughout; and purely descriptive mineralogical and petrographical detail has been omitted. Every petrologist who reads this book will recognise the author's indebtedness to Dr. A. Harker and Dr. A. Holmes, among British workers; to Prof. R. A. Daly, Dr. H. S. Washington, and Dr. N. L. Bowen, among American petrologists; and to Prof. J. H. L. Vogt, Prof. V. M. Goldschmidt, Prof. A. Lacroix, and Prof. P. Niggli, among European investigators. The emphasis laid on modern views, and the relative poverty of references to the works of the older generation of petrologists, does not imply any disrespect of the latter. It is due to recognition of the desirability of affording the petrological student a newer and wider range of reading references than is usually supplied in this class of work; for references tend to become stereotyped as well as text and illustrations. Furthermore it is believed that all that is good and living in the older work has been incorporated, consciously or unconsciously, in the newer.

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## PETROGENESIS OF METAMORPHIC ROCKS

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*Springer Science & Business Media* Metamorphic rocks are one of the three classes of rocks. Seen on a global scale they constitute the dominant material of the Earth. The understanding of the petrogenesis and significance of metamorphic of geological education. rocks is, therefore, a fundamental topic There are, of course, many different possible ways to lecture on this theme. This book addresses rock metamorphism from a relatively pragmatic view point. It has been written for the senior undergraduate or graduate student who needs practical knowledge of how to interpret various groups of minerals found in metamorphic rocks. The book is also of interest for the non-specialist and non-petrologist professional who is interested in learning more about the geological messages that metamorphic mineral assemblages are sending, as well as pressure and temperature conditions of formation. The book is organized into two parts. The first part introduces the different types of metamorphism, defines some names, terms and graphs used to describe metamorphic rocks, and discusses principal aspects of metamorphic processes. Part I introduces the causes of metamorphism on various scales in time and space, and some principles of chemical reactions in rocks that accompany metamorphism, but without treating these principles in detail, and presenting the thermodynamic basis for quantitative analysis of reactions and their equilibria in metamorphism. Part I also presents concepts of metamorphic grade or intensity of metamorphism, such as the metamorphic-facies concept.

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## PLATES, PLUMES, AND PARADIGMS

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*Geological Society of America*

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## METAMORPHIC PETROLOGY

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*CRC Press* A major international text for intermediate and advanced students of metamorphic petrology.