

File Type PDF By Loren A
Raymond Petrology The Study
Of Igneous Sedimentary And
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*Raymond Petrology
The Study Of
Igneous
Sedimentary And
Metamorphic Rocks
Hardskt Hardcover*

This text, designed for the middle-level undergraduate geology major, incorporates both fundamentals and information on recent advances in our understanding of igneous, sedimentary, and metamorphic rocks. It provides an overview of the field of petrology and a solid foundation for more advanced studies. For each class of rocks -- igneous, sedimentary, and

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metamorphic -- the author describes textures, structures, mineralogy, chemistry, and classification as a background to discussing representative occurrences and petrogenesis (rock origins). Offering a chapter on each of the most common methods of exploration, the text explains in detail how each method is performed and discusses that method's geologic, engineering, and environmental applications. In addition to ample examples, illustrations, and applications throughout, each chapter concludes with a problem set. The text is also accompanied by the Field Geophysics Software Suite, an innovative CD-ROM that allows students to experiment with refraction and reflection seismology, gravity, magnetics, electrical

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resistivity, and ground-penetrating
radar methods of exploration."

An understanding of rocks and the
minerals that comprise them lies at
the core of every geologist ' s
education. As more curricula combine
mineralogy and petrology into a
single course, Raymond and Johnson
have responded with a concise
introduction to the study of Earth
materials. The authors have written at
a level that won ' t intimidate
students encountering fundamental
concepts for the first time, yet with
enough rigor that they ' ll be well
prepared for future study. A broad
approach to the subject that
incorporates fluids and soils will
appeal to instructors who teach
engineering and environmental
science students as well as future
geoscientists. Abundant illustrations

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reinforce all of the ideas in the text. Many images are presented in color, with additional color images available at waveland.com/Raymond-Johnson. Problems appear throughout the book, encouraging a deeper understanding for students. Helpful appendices make it easy for instructors to assign further exercises in rock and mineral identification as well as optical mineralogy and petrography.

This book presents a summary of the geology of the Transantarctic Mountains for Earth scientists who may want to work there or who need an overview of the geologic history of this region. In addition, the properties of the East Antarctic ice sheet and of the meteorites that accumulate on its surface are treated in separate chapters. The presentation ends with

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the Cenozoic glaciation of the
Transantarctic Mountains including
the limnology and geochemical
evolution of the saline lakes in the ice-
free valleys. • The subject matter in
this book is presented in
chronological order starting about
750 million years ago and continuing
to the present time. • The chapters
can be read selectively because the
introduction to each chapter
identifies the context that gives
relevance to the subject matter to be
discussed. • The text is richly
illustrated with 330 original line
drawings as well as with 182 color
maps and photographs. • The book
contains indexes of both subject
matter and of authors ' names that
allow it to be used as an encyclopedia
of the Transantarctic Mountains and
of the East Antarctic ice sheet. •

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Most of the chapters are supplemented by Appendices containing data tables, additional explanations of certain phenomena (e.g., the formation and seasonal destruction of stratospheric ozone), and illustrative calculations (e.g., ^{38}Cl dates of meteorites). • The authors have spent a combined total of fourteen field seasons between 1964 and 1995 doing geological research in the Transantarctic Mountains with logistical support by the US Antarctic Program. • Although Antarctica is remote and inaccessible, tens of thousands of scientists of many nationalities and their assistants have worked there and even larger numbers of investigators will work there in the future.

In this book the task of summarising modern petrology from the genetic

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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

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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 refer ences 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. Aids in identifying eight hundred species of common North American fossils with color photographs and line drawings

[The Principles of PETROLOGY
Rocks, Ice, Meteorites and Water
Fiftieth Anniversary Perspectives](#)

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[Examination of Water and](#)

[Wastewater \(Volume 18\).](#)

[The Story of Earth](#)

[Petrography Laboratory Manual](#)

[A Pictorial Guide to Metamorphic](#)

[Rocks in the Field](#)

*"Fabulous Fossils is a
timely and significant
contribution to the
history of science and
evolutionary paleontology.*

*It details humanity's
interest and developing
understanding of
trilobites from the*

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recovery of these fossils
at 15,000 year-old

Paleolithic sites, to the
18th century appreciation
that they were arthropod
fossils. This volume
elaborates on the
development of modern
trilobite research in
Australia and a number of
American, European, and
Asian
countries" --Publisher's
description.

In warfare, military
geologists pursue five
main categories of work:
tactical and strategic
terrain analysis,
fortifications and

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tunneling, resource
acquisition, defense
installations, and field
construction and
logistics. In peace, they
train for wartime
operations and may be
involved in peace-keeping
and nation-building
exercises. In addition to
the introductory paper
this volume includes 24
papers, covering selected
aspects of the history of
military geology from the
early 19th century through
the recent Persian Gulf
war.

The Australide orogen, the
southern hemisphere

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*Neoproterozoic to Mesozoic
terranes accretionary
orogen that forms the
palaeo-Pacific margin of
Gondwana, is one of the
largest and longest-lived
orogens on Earth. This
book brings together a
series of reviews and
multidisciplinary research
papers that
comprehensively cover the
Australides from the
Tasman orogen of eastern
Australia to the
Neoproterozoic and
Palaeozoic orogens of
South America, taking in
New Zealand and Antarctica
along the way. It deals*

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with the evolution of the southern Gondwana margin, as it grew during a series of terrane accretion episodes from the late Proterozoic through to final fragmentation in mid-Cretaceous times. Global perspectives are given by comparison with the Palaeozoic northern Gondwana margin and documentation of world-wide terrane accretion episodes in the Late Triassic-Early Jurassic and mid-Cretaceous. The Tasmanides of eastern Australia, and the terrane histories of New Zealand

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and southern South America
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are given comprehensive up-
to-date reviews.
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The authors argue that the growth pattern and form of the colony in many bryozoans is an adaptive strategy rather than a stable genetic character. "Bryozoan Evolution is profusely illustrated and has a bibliography of over 400 titles. It will find an appreciative audience of paleontologists, invertebrate zoologists, and ecologists thanks to its innovative and detailed evaluations of the roles of ecology,

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adaptive and functional morphology, life histories, biomechanics, developmental constraints, and chance on the evolution of the marine taxa of this speciose group."—Russel L. Zimmer, *Science* "This book is an excellent source of information on the functional morphology and variety of colonial architecture in bryozoans, very well illustrated, and worth reading at least twice."—Robert L. Anstey, *Paleobiology* "Even as one of the converted, I found the book a stimulating

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combination of
paleobiology and ecology.
In many ways it is a
'teaser'-the authors
suggest a number of
interesting hypotheses,
and can test only some of
them. Perhaps most
important, McKinney and
Jackson provide a plethora
of fascinating ideas and
examples that demonstrate
the potential of this
group of animals, and that
should stimulate more
work."-Michael S. Keough,
TREE "This stimulating
book is sure to promote
further interest in
bryozoans. It will appeal

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to biologists and
paleontologists
Metamorphic Rocks Hardcover

alike." -Paul Taylor, Times
Higher Education
Supplement

*Dedicated to Bob Hatcher,
this Memoir explores
linkages between tectonic
processes through a series
of field-, numerical- and
laboratory-based studies,
concentrating on feedback
mechanisms within ancient
and evolving orogens by
which individual or linked
tectonic processes may
influence or predetermine
the operation of other
processes in space and
time. Case studies cover a*

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wide range of ancient to modern orogens: the Svecofennian of southern Finland, the Gyeonggi Massif of Korea, the Caledonides of northern Scotland, the Variscan of the East European craton, the Appalachians of the eastern United States, the European Alps and Dinarides, north Cascades of the northwestern United States, and the Himalaya. Emphasis is placed on integration between data sets developed from a wide range of analytical approaches, including: field mapping, seismic

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*reflection profiling,
strain analyses,
petrology, isotopic
dating, and numerical
modeling-based studies of
thermal evolution
associated with tectonic
processes such as thrust-
related burial and
exhumation.*

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

*Handspecimen and Thin
Section Petrography*

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The Study of Igneous,
Sedimentary, and
Metamorphic Rocks

The Audubon Society Field
Guide to North American
Fossils

300 Years of Worldwide
Research on Trilobites
Petrology of Sedimentary
Rocks

An Introduction to the
Science of Rocks

Petrography Laboratory
Manual, Volume 1

Petrography of Igneous and
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[A short introduction](#)

A concise introduction to the mineralogy and petrology of igneous and metamorphic rocks for all Earth Science students. Developed with extensive community involvement and support from the US National Science Foundation, it is about our planet's dynamic surface, a place where Earth and atmosphere meet and life thrives. Key Concepts in Geomorphology takes an integrative science approach that applies principles of physics, chemistry, biology, and mathematics in the understanding of Earth surface processes and the evolution of topography over short and long

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*timescales to solve problems
important to people and
societies. The authors also hone
in on practical applications,
showing how scientists are
using geomorphological
research to tackle critical
societal issues (natural disaster
response, safer infrastructure,
protecting species, and more).
Introduces practical seismic
analysis techniques and
evaluation of interpretation
confidence, for graduate
students and industry
professionals - independent of
commercial software products.
An understanding of rocks and
the minerals that comprise them
lies at the core of every*

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*geologist's education. As more
curricula combine mineralogy
and petrology into a single
course, Raymond and Johnson
have responded with a concise
introduction to the study of Earth
materials. The authors have
written at a level that won't
intimidate students encountering
fundamental concepts for the
first time, yet with enough rigor
that they'll be well prepared for
future study. A broad approach
to the subject that incorporates
fluids and soils will appeal to
instructors who teach
engineering and environmental
science students as well as
future geoscientists. Abundant
illustrations reinforce all of the*

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*ideas in the text. Many images
are presented in color, with
additional color images available
at [waveland.com/Raymond-
Johnson](http://waveland.com/Raymond-Johnson). Problems appear
throughout the book,
encouraging a deeper
understanding for students.
Helpful appendices make it easy
for instructors to assign further
exercises in rock and mineral
identification as well as optical
mineralogy and petrography.
The author of the best-selling
Science Matters outlines a
radical new approach to geologic
history that advances
controversial theories that the
Earth evolved and that life
evolved from minerals,*

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*assessing supportive findings
while explaining the impact of
human actions.*
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*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*

Bryozoan Evolution

The Study of Igneous,

**Sedimentary, Metamorphic
Rocks**

**The Centennial Record of the
University of California**

A Practical Guide

Igneous Rocks and Processes

**Essentials of Igneous and
Metamorphic Petrology**

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Igneous Petrogenesis

Introduction to Mineralogy and Petrology

Terrane Processes at the Margins of Gondwana

Evolution of the Igneous Rocks

This short introduction aims to provide archaeologists of all backgrounds with a grounding in the principles, materials, and methods of geology. Each chapter ends with a short reading list, and many have selected case-histories in illustration of the points made. Included is a glossary of technical terms.

The geologic record contains evidence of greenhouse climates in the earth's past, and by studying

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these past conditions, we can gain greater understanding of the forcing mechanisms and feedbacks that influence today's climate. Leading experts in paleoclimatology combine in one integrated volume new and state-of-the-art paleontological, geological, and theoretical studies to assess intervals of global warmth. The book reviews what is known about the causes and consequences of globally warm climates, demonstrates current directions of research on warm climates, and outlines the central problems that remain unresolved. The chapters present new research on a number of different warm climate intervals from the early Paleozoic to the

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early Cenozoic. The book will be of great interest to researchers in paleoclimatology, and it will also be useful as a supplementary text on advanced undergraduate or graduate level courses in paleoclimatology and earth science. The Evolution of the Igneous Rocks, by N. L. Bowen, appeared in 1928 and had a profound influence on later generations of petrologists. Drawing on his series of lectures at Princeton University in the spring of 1927, Dr. Bowen identified, outlined, and applied the principles of physical chemistry relevant to petrological processes. Whereas the major petrochemical questions he discussed are still relevant today, the answers appear

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to change with time. The purpose of the present volume is to provide an updated view of those questions, in the light of almost fifty years of accumulated observations, using the principles Bowen set forth. Originally published in 1979. The Princeton Legacy Library uses the latest print-on-demand technology to again make available previously out-of-print books from the distinguished backlist of Princeton University Press. These editions preserve the original texts of these important books while presenting them in durable paperback and hardcover editions. The goal of the Princeton Legacy Library is to vastly increase access to the rich scholarly heritage found in the

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thousands of books published by
Princeton University Press since its
founding in 1905.

Key concepts in mineralogy and
petrology are explained alongside
beautiful full-color illustrations, in
this concisely written textbook.
courses more petrogenesis-
orientated are in My main objective
in writing this book has been to
mediatey confronted with a basic
problem; the review the processes
involved in present-day mag ma
generation and their relationship to
global average student does not
have a strong enough tectonic
processes. Clearly, these are
fundamental background in
geochemistry to understand the to
our understanding of the

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petrogenesis of ancient finer points of most of the relevant publications in volcanic and plutonic sequences, the original tec scientific journals. It is virtually impossible to find tonic setting of which may have been obscured by suitable reading material for such students, as most subsequent deformation and metamorphism. authors of igneous petrology textbooks have de Until fairly recently, undergraduate courses in liberately steered clear of potentially controversial igneous petrology tended to follow rather classical petrogenetic models. Even the most recent texts lines, based on the classification of igneous rocks, place very little emphasis on the geochemistry of descriptive

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petrography, volcanic landforms, types magmas erupted in different tectonic settings, of igneous intrusions and regional petrology . despite extensive discussions of the processes re However, the geologist of the late 1980s requires, in sponsible for the chemical diversity of magmas.

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

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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

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the structure of the Earth's mantle and core, the properties and behaviour of magmas, recent results from satellite imaging, and more.

[Principles of Igneous and Metamorphic Petrology](#)

[Metamorphic petrology](#)

[Fabulous Fossils](#)

[Geology for Archaeologists](#)

[Tectonostratigraphic Terranes of the Circum-Pacific Region](#)

[The Transantarctic Mountains](#)

[The Study of Igneous Sedimentary Metamorphic Rocks](#)

[Heritage of the Petroleum Geologist](#)

[Warm Climates in Earth History](#)

[Terrane Accretion and Orogenic Belts](#)

[Petrology](#)

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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

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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

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pyroclastic volcanology.
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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

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colour plates.

Additional resources for
this book can be found
at: [http://www.wiley.com
/go/gill/igneous](http://www.wiley.com/go/gill/igneous).

This book is an
illustrative
introduction to
metamorphic rocks as
seen in the field,
designed for advanced
high school to graduate-
level earth science and
geology students to jump-
start their
observational skills. In
addition to photographs
of rocks in the field,
there are numerous line

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diagrams and examples of
metamorphic features

shown in thin se

Key Concepts in

Geomorphology

Linkages and Feedbacks

in Orogenic Systems

Crustal Earth Materials

Introduction to Applied

Geophysics

Petrography laboratory

manual

Handspecimen Petrography

Petrology: Igneous

petrology ; 2.

Sedimentary petrology ;

3. Metamorphic petrology

An Interpreter's

Handbook

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