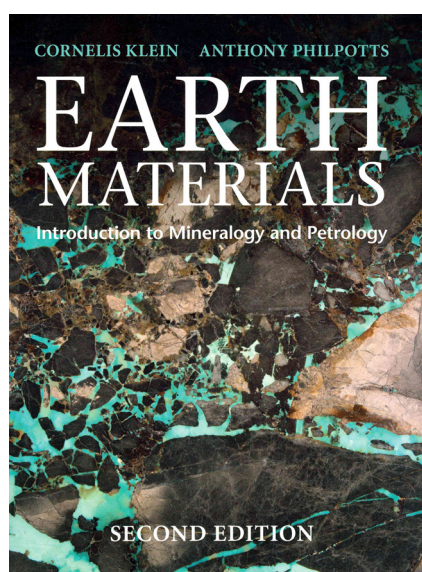


Earth materials. Introduction to mineralogy and petrology (Second edition), by Cornelis Klein and Anthony R. Philpotts, 2017. Cambridge University Press, Cambridge, UK. 616 pages. Paperback: price £44.99 ISBN: 9781316608852.



The present tome appeared in print four years ago, as a second edition comprising 18 chapters in which a wide spectrum of subjects is discussed: from the solar system and formation of the Earth, through mineralogy and an introduction to petrology, to an introduction to mineral resources.

In the first chapter, the authors briefly outline the solar system and the formation of our planet, covering the genesis of chemical elements and the birth of the Earth (pp. 1–11), as well as Earth's internal structure and the primary principles of plate tectonics in connection to rock formation. Chapter 2 (pp. 13–35) is an introduction to materials on the solid Earth, definitions of minerals and rocks and their classifications, as well as systems of generation of rocks in different geotectonic environments, including factors that allow for the formation of rocks and minerals. The following chapters (3–6, pp. 37–157) discuss the primary physical and optical features, fundamentals of crystal structures and crystallography and the use of various methods (e.g., polarising microscope, X-ray diffraction, spectroscopy) in the identification of minerals.

The next portion of the book (chapters 7–15, pp. 159–475) presents details of the main rock components, including igneous, sedimentary and metamorphic types. Each chapter is divided into subsections with detailed descriptions of the most important rock-forming minerals and processes. Chapters 8–10 cover igneous processes, including the main principles of thermodynamics and melting and pressure as important factors in magmatism. The behaviour, occurrence and classification of igneous rocks, as well as a description of the most important minerals are also included. Chapters 11 and 12 discuss the main sedimentary minerals, rocks and processes, and chapters 13 and 14 describe rock-forming minerals in metamorphic rocks, inclusive of their formation.

The final chapters, 16, 17 and 18 (pp. 477–541), home in on selected minerals that are of importance in economy, resources and human health. Moreover, veins and pegmatites are described in detail as parent rocks for some mineral deposits.

In a condensed fashion, the present textbook covers current knowledge of mineralogical and petrological issues, starting from definitions, through classifications to explanations of processes that formed our planet. The introduction presents the main principles of formation of the Earth and chemical elements on Earth with a reference to the solar system. The most frequent minerals in igneous (such as silicates, oxides and sulphides), sedimentary and metamorphic rocks are clearly described. The origin of igneous rocks is presented on the basis of the principles of thermodynamics: pressure and temperature factors. Sedimentary rocks – in very basic and general terms – contain the primary groups of minerals (carbonates, sulphates and phosphates) and reflect the processes of their formation.

The tome is well organised, with well-written and comparatively short chapters. Each of these includes a brief summary describing the most important issues in short, clear sentences. The review questions included at the end of each chapter add

a great value of this book, because they permit the most important issues of each chapter to be recapitulated and allow to check the student's grasp of the material. Recommended are also various items of literature and online resources, for further reading.

Appendices at the end of the book provide useful data: a glossary, lists of minerals and their varieties, common igneous, sedimentary and metamorphic rocks, common units of measure, an index of issues, as well as charts of optical features, modal abundance of elements and the periodic table of elements. The appendices greatly facilitate the use of this comprehensive textbook. The graphic design is well executed and refined where details are concerned; the book is richly and appropriately illustrated with coloured line drawings, diagrams and photographs. The diagrams and charts are presented in a proper sequence, from general to very specific. Some of the drawings, such as stereographic projections on the Wulf net, were adapted from CD-books by the first author, and illustrate the crystallography of minerals in a clear way. The high quality of macro- and microphotography is

particularly valuable; it perfectly reflects the properties of minerals. Rock and mineral classifications are supplemented with photographs (e.g., the IUGS classification and diagrams depicting the thermodynamics of minerals and rock genesis have links to photographs and microphotographs of specific cases). The descriptions of minerals are enriched with structural graphs and large photographs of excellent quality.

The present tome constitutes a valuable study of mineralogy and petrography and provides the most important data on components of igneous, sedimentary and metamorphic rocks, their physical and optical properties, as well as their formation and classification. It really is a high-quality, extensive and exceptionally well-illustrated compendium of current knowledge on mineralogy and petrography for undergraduate students.

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