Atlas of Minerals and Igneous and Metamorphic Rocks in Thin-Section

The *Atlas of Minerals and Igneous and Metamorphic Rocks in Thin-Section* provides the geology student and geoscientist with a stunning new color atlas of the main rock-forming minerals and igneous and metamorphic rocks in thin-section. It showcases minerals in various settings and degrees of alteration and preservation to allow users to best identify their own specimens in practice. Chapter 1 highlights the distinctive characteristics used to identify different minerals. Building on this base, following chapters describe rock textures and types, summarizing their petrogenesis within a plate tectonic framework. This book also includes insights into how additional information from petrographic thin-sections can be obtained using modern analytical methods to increase our understanding of geological processes. The *Atlas* is an indispensable reference textbook for all facilities that use a petrographic microscope, for professional geoscientists, and as an aid for any student studying minerals and rocks.

Alessandro Da Mommio completed his PhD in geology at the University of Milan in 2015. With a long-standing expertise in petrography since his undergraduate studies, he has developed a distinguished website dedicated to his specialty: the petrography of minerals and rocks. In 2014, one of his images secured second place in the Nikon Small World Photomicrography Competition. He's currently teaching science and mathematics.

Victoria Pease is Professor of Tectonics and Magmatism at Stockholm University. Her research focuses on Arctic tectonics. She has been teaching the next generation of geologists for more than 20 years. She sits on a number of international scientific committees and is Chief Editor of *Precambrian Research*. Victoria is co-author (with Hugh Rollinson) of the reference textbook *Using Geochemical Data: To Understand Geological Processes, Second Edition* (2021, Cambridge University Press).

"*Atlas of Minerals and Igneous and Metamorphic Rocks in Thin-Section* by A. Da Mommio and V. Pease is a well-researched and easy-to-use reference. Fundamental characteristics of minerals and rocks in thin-section are combined with high-quality images that will be useful to beginners and experts alike. Thin-sections are the windows into igneous and metamorphic processes, and this atlas will become an essential component of the petrologist's toolbox."

Professor Wendy Bohrson, *Colorado School of Mines*

"The atlas contains a wealth of spectacular color photomicrographs that beautifully illustrate the essential information about minerals and rocks and provide a visual basis for identifying their textures and fabrics. Information boxes explain key aspects of mineralogy and petrology in greater detail, and application boxes provide examples of advanced techniques and broader interpretations of rock and mineral data. An indispensable reference for all geoscientists."

Professor Carol D. Frost, *University of Wyoming*

"Observing rocks and minerals through a petrological microscope offers a captivating experience that continues to engage both students and researchers. While each thin-section reveals a unique glimpse into the origin and formation of Earth's building blocks, a systematic approach is essential to unravel this information. *Atlas of Minerals and Igneous and Metamorphic Rocks in Thin-Section* by Alessandro Da Mommio and Victoria Pease introduces the remarkable optical shifts that occur when light rays of different wavelengths pass through crystal structures. The book explores the optical properties of common minerals found in igneous and metamorphic rocks, along with their microscopic textural relationships, enhanced by numerous beautiful color images. It will serve as a valuable resource for those beginning their studies in petrology."

Professor Sally A. Gibson, *University of Cambridge*

"This book is the unmistakable descendent of the classic mineralogy text of Deer, Howie, and Zussman, but is richly illustrated with beautiful photomicrographs of the minerals themselves. Collectors, students, and professionals will all enjoy and benefit from it."

Professor Robert J. Stern, *University of Texas at Dallas*

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Alessandro Da Mommio
University of Milan

Victoria Pease
Stockholm University

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Preface

Determining what is a "common" versus "uncommon" mineral is somewhat subjective. We tend to be inclusive; for example, insofar as a mineral such as kalsilite may be relatively rare, it is not uncommon in its normal paragenesis – that is, unusual ultra-high-K rocks – and so we include it here. Given that our intended audience is not just undergraduates but also advanced students and beyond, we feel this is warranted.

We have depended on the foundational work of Deer, Howie, and Zussman (DHZ) throughout our careers and have continued to do so for much of the optical information included in Chapter 1. We cannot stress enough the value of their work. For the student who anticipates utilizing petrography beyond their undergraduate education, DHZ provide a wealth of information on recognition, characterization, experimentation, and paragenesis of the rock-forming minerals well beyond that conveyed here, and we highly recommend it as a life-long reference.

Chapter 1 focuses on the minerals found in igneous and metamorphic rocks. Chapter 2 combines these minerals with the textures of igneous rocks and introduces the rocks themselves, following the naming conventions of the International Union of Geological Sciences (IUGS). Chapter 3 addresses the minerals, textures, and fabrics of metamorphic rocks, as well as the rocks themselves, and broadly follows IUGS naming conventions, although we acknowledge that this is not necessarily the most widely adopted nomenclature at present.

Each chapter provides more detailed information on minerals, textures, and rocks in the form of *information boxes*, while *applications* explore how the information gleaned from the petrographic evaluation of thin-sections can be used to further our understanding of mineral- and rock-forming processes – that is, how what you see in a thin-section can be applied. Relevant textbooks and references are given at the end of each chapter, allowing those interested to delve more deeply into a given topic.

The observations and textural descriptions of minerals and their relationships in rock thin-sections is a fundamental part of geology and a necessary foundation for most of today's more advanced applications, from geochronology to pressure–temperature–time paths. It is amazing to us how a simple petrographic microscope provides such a wealth of information – its scientific added value is completely disproportionate to this relatively inexpensive investigative tool!

We hope you enjoy looking at minerals and rocks under the microscope as much as we have enjoyed sharing them with you.

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