synthetischen und getemperten Plagioklase. Eine grosse Rolle spielen die möglichen Diskontinuitäten und die Darstellung der physikalischen Eigenschaften in ternären Systemen. Das Kapitel endet mit der Darstellung der thermischen Ausdehnung und der elastischen Konstanten.

Im Abschnitt thermodynamische Eigenschaften werden Daten über Mol-Volumen, Enthropie, Bildungsenergie und partielle freie Energie zusammengestellt und diskutiert. Als Beispiel findet eine besondere Beachtung die Bildung von Mischungslücken bei den Alkali-Feldspäten, wie sie auf Grund der Verteilungskoeffizienten von Orville errechnet werden konnten. Die Löslichkeit der Orthoklase im reinen Wasser, die Darstellung der Stabilitätsfelder mit koexistierenden Mineralien und das Schmelzverhalten der Feldspäte werden eingehend beschrieben und an Mehrstoffsystemen dargestellt. Aus ihnen wird das Barth'sche Thermometer entwickelt, das aus der Verteilung der Albit-Moleküle in Orthoklasen und Plagioklasen abgeleitet wird.

Dieses Buch ist von einem Wissenschaftler geschrieben, der in 4½ Dezennien das Problem der Feldspäte und ihre Deutung für einen genetischen Code zu einem seiner Hauptarbeitsgebiete gemacht hat. Es sind sehr viele Eigenschaften in dem Buch behandelt worden, die meisten Diagramme sind neu entworfen. In manchen Fällen hätte man sich gewünscht, dass sie etwas grösser ausgefallen wären.

Das Buch ist für fortgeschrittene Studenten der Mineralogie und Geologie geschrieben; für den Kristallographen, der auf dem Gebiet der Feldspäte arbeitet, stellt es eine wichtige Literaturzusammenstellung dar, darüber hinaus ist es auch eine Fundgrube von Überlegungen und Anregungen für weitere Untersuchungen. Auch dem Feldpetrographen bringt es viele Anregungen zum Problem der Entstehung der Gesteine und ihrer Metamorphose, so dass diesem Buch eine weite Verbreitung sicher ist.

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Practical optical crystallography. By N. H. HARTSHORNE and A. STUART. 2nd ed. Pp. ix+326. London: Arnold, 1969. Price 75*s*.

This book is a valuable introduction to experimental aspects of crystal optics. Chemists, X-ray crystallographers, students working in the fields of ceramics and concrete and geology students will find this an easy-to-read book, yet sufficiently detailed to enable them to understand the main principles of optical crystallography. This includes a detailed description of the use of the polarizing microscope and methods of evaluating the results obtainable with this important instrument.

Elementary knowledge in chemistry and physics with some understanding of crystallographic mineralogy should be a sufficient background for understanding this book.

This second edition differs only from the first (1964) edition in that a few misprints have been corrected, and a few passages have been brought up to date – without altering the pagination as is stressed in the preface. In many respects it follows the treatment in the authors' larger work *Crystals and the Polarizing Microscope* of which the third edition appeared in 1960.

The first chapter *The Morphology of Crystals* (47 pages) starts with the 14 Bravais lattices and gives a rough outline of symmetry and geometry of the 32 crystal classes illustrated through short tables accompanied by 53 crystal drawings. The Hermann–Mauguin symbols are given in their short form. One might have had them in full instead of the peculiar notation system for symmetry elements which to the reviewer seems unnecessarily tiresome. Habit, twin crystals and cleavage are briefly treated and illustrated.

The wave properties of light (19 pages) are treated as an introduction to the chapter on the optical properties of uniaxial and biaxial crystals (44 pages). The principles for the passage of light through crystals are established in sufficient detail to provide the necessary background for experimental applications. Absorption, optical activity and the relations between optical properties and crystal structure are briefly mentioned.

The Polarizing Microscope (44 pages) contains details of the optical principles and the construction of modern microscopes. The importance of correct illumination and how to obtain it is treated well and it is very gratifying to see how the authors stress the meaning of magnification, aperture use and resolution. The detailed remarks on the practical and care of the microscope are a valuable addition to this section of the book.

The main chapters on *The Microscopic Examination of Crystals* treat separately *Orthoscopic Observations* (*'Parallel' Light*) (44 pages) and *Conoscopic Observations* (*'Convergent' Light*) (41 pages). Crystal shape, refractive indices, properties related to the polarization of light, double refraction, optical character of the crystals and the relations of the optical properties to the morphology of the crystals are covered in detail and accompanied by adequate illustrations.

Introductory to the chapter on the preparation and manipulation of crystals is a chapter on *The Stereographic Projection* (22 pages). The use of this device is made clear to the student through several examples. As the authors are specially interested in single-crystal examinations they stress in the following chapter methods of preparing and mounting of single crystals. Many valuable practical tips are given here. One gets a feeling for the authors' enthusiasm for the study of crystals in their treatment of *Methods of Changing the Orientation of Crystals* under the microscope. Many ingenious ways are described. It is comforting for one who likes simplicity to note that the authors underline the fact that rotation about one axis of the crystal in a random orientation will bring every radius vector of the indicatrix parallel to the microscope stage and thus permit measurement of all principal refractive indices in the mount.

The closing chapter contains some practical examples concerning the optical description of various crystalline materials which is a good guide for the student carrying out this sort of activity.

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