Probleme über experimentelle Arbeiten hinaus bis zu metallkundlich-technischen Themen, die etwa der Realisierung bestimmter Werkstoffparameter dienen. Zur Illustration seien einige Beispiele aus dem vorliegenden Heft genannt: Theorie ferromagnetischer Resonanz. Berechnung von Selbstdiffusionskoeffizienten. Kristallgeometrische Besprechungen zum Austenit- und Cementit-Gitter. Anomales Verhalten von Kupfer unter Kriechbedingungen. Der Widerstand von kohlenstoffhaltigem Martensit. Magnetische Eigenschaften von Vicalloy.

Die Arbeiten besitzen durchweg ein hohes wissenschaftliches Niveau und sind, nach Stichproben beurteilt, gewissenhaft übersetzt. Die drucktechnische Gestaltung der Zeitschrift ist ansprechend. Insgesamt bildet die Publikation für den des Russischen nicht mächtigen Wissenschaftler einen bequemen Zugang zu dem umfangreichen und gewichtigen Beitrag der sowjetischen Forschung zu den Metallwissenschaften.

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Hydrothermal synthesis of crystals. Edited by A. N. Lobachev. Pp.xiii+153, New York: Plenum Press. 1971. Price $22.40.

Diese Veröffentlichung setzt eine Reihe zwanglos erscheinender Hefte wissenschaftlicher Arbeiten fort, die als 'special research report' – ursprünglich aus dem Russischen (1968) – vom Consultants Bureau, New York, London herausgegeben werden.

Die Zusammenstellung behandelt 14 Einzelpublikationen von Mitarbeitern aus dem Laboratorium für Hydrothermalsynthesen des Kristallographischen Instituts der Akademie der Wissenschaten der USSR.

N. Yu. Ikornikova beschäftigt sich mit – teilweise schon bekannten – physikochemischen Eigenschaften wässeriger Lösungen einiger Hydroxide, Chloride, Sulfate und Karbonate der Alkalien.

A. A. Shternberg's Arbeit ist den Kristallisationsvorgängen im Autoklaven gewidmet. Besondere Aufmerksamkeit lenkt er auf die Züchtungsmethode nach dem Temperaturgradienten-Verfahren.

Der experimentelle Beitrag von N. Yu. Ikornikova und V. M. Egorov beinhaltet ptc-Gleichgewichtsbestimmungen in Alk.–Cl–H_2O Systemen im Temperaturbereich von 150–700°C und gleichzeitigen Drucken bis zu 2500 bar.

V. A. Kuznetsov berichtet kurz über den Einfluss von Oberflächen-Aktivierungsenergien auf die Züchtung von Einkristallen. Insbesondere wird die Kristallisationskinetik an Korund-Einkristallflächen in Na- und K-Karbonatlösungen verfolgt, in geringem Umfang auch die von Quarz und Zinkit.

In einer kurzen Abhandlung werden von V. A. Kuznetsov, M. M. Tikhomirova und A. S. Shternberg Untersuchungsergebnisse über den Einfluss des Redox-Potentials diverser Lösungen auf Transportreaktionen zur Züchtung von Rubin-Einkristallen vorgelegt.

L. N. Dem'yanets widmet sich der hydrothermalen Herstellung von Kristallen folgender Systemgruppen: (Ca, Sr, Ba)WO_4–Alk. Cl, (Ca, Sr, Ba)WO_4–Alk.OH; (Ca, Sr, Ba)MoO_4–Alk. Cl und (Ca, Sr, Ba)MoO_4–Alk. OH; ferner (Cd, Pb, Zn)WO_4–Alk. Cl und (Cd, Pb, Zn)MoO_4–Alk. Cl.

N. Yu. Ikornikova berichtet über die gelungene Züchtung von Einkristallen der trigonalen Karbonatgruppe der Kationen Ca, Mg, Cd, Mn, Fe, Co in wässerigen Alk. Cl-Lösungen.

Die Synthese diverser Germanate in dem System Na_2O–ZnO–GeO–TiO–H_2O, bzw. Teilsystemen desselben, wird von I. P. Kuz'mina, O. K. Mel'nikov und B. N. Litvin beschrieben.

Mit der Synthese der in der Natur nicht bekannten Cd-Silikate beschäftigen sich M. A. Simonov, O. K. Mel'nikov und B. N. Litvin. Ihnen gelang in Gegenwart NaOH haltiger wässeriger Lösungen die Darstellung folgender Silikate: $Na_2Cd_4Si_6O_{17}$, $Na_2Cd_3Si_3O_{10}$, $Cd_5Si_2O_9$, $Na_2Cd\ Si_2O_6$, $Na_4Cd_2Si_3O_{10}$.

Yu. M. Butt, B. N. Litvin, V. V. Timashev und V. S. Bakshutov beschäftigen sich mit der Herstellung von Einkristallen verschiedener Calciumsilikat-Hydrate.

Eine Untersuchungsreihe von O. K. Mel'nikov, B. N. Litvin und S. P. Fedosova beschreibt die Kristallisationsbedingungen für eine Serie von Kristallen der Helvin-Gruppe, allgemein mit der Formel $M^{II}_8(Be_6M^{IV}_6O_{24})R_2$ zum Ausdruck gebracht, wobei M^{II} für Mn, Fe, Zn und Cd steht, M^{IV} bedeuted Si oder Ge, R steht für S, Se und Te. Von diesen liessen sich 15 Verbindungen mit Helvin-Struktur synthetisieren, lediglich die Danalite (Fe-haltig) kamen nicht zur Kristallisation.

Mit der Herstellung von Mineralen der Tourmalin-Gruppe beschäftigt sich eine Zusammenstellung von I. E. Voskresenskaya und M. L. Barsukova. Die gelungene Synthese einiger Tourmaline wird für einen Tem. Bereich von 400–750°C bei Drucken von 1000 bis 2000 bar bescrieben. Als Ausgangsmaterial dienten Gläser der Zusammensetzung einiger nat. Al.-Silikate, Dumortierite, und Tourmaline mit H_3BO_3 und Na(Cl, F)

Am Schluss folgen zwei Beschreibungen von B. N. Litvin und D. A. Tules sowie von A. A. Shternberg über die an diesem Institut verwendeten Autoklaven.

Das Buch ist von Wert für alle jene Forschergruppen, die sich allgemein mit der hydrothermalen Züchtung von Einkristallen beschäftigen, inbesondere aber für jene, die Interesse an den obengenannten Systemen haben. Die Veröffentlichungen sind leicht verständlich geschrieben, von gutem wissenschaftlichem Niveau und, da mit reichlich Literaturangaben versehen, vermitteln Einblick in den Wissensstand russischer hydrothermalsynthetischer Kristallzüchtungen.

In Anbetracht der schwierigen Übersetzung und der dafür erforderlichen fachwissenschaftlichen Sachkenntnis ist auch der relativ hohe Preis gerechtfertigt.

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Tables for microscopic identification of ore minerals. By W. Uytenbogaardt and E. A. J. Burke. 2nd revised edition. Pp. XI+430. Amsterdam: Elsevier, 1970. Price *f* 57.50. *(ca.* $ 16.00*)*

In 1951 Uytenbogaardt published the first edition of *Tables for Microscopic Identification of Ore Minerals* based on two crystallographic properties – hardness and reflectance. However the values to be found in the literature at that time were measured with a variety of instruments and reliable and comparable data were hardly ever found. The polishing hardness was therefore used to list the minerals in one of the determinative Tables. Polishing hardness is a relative quantity revealed by the mutual relief due to the difference in hardness between neighbouring minerals. The difference can be noted by observation of a bright line of light appearing along the border of the two minerals. When the distance to the ob-

ject is increased this line moves into the softer mineral. The microscopist can thus easily rank the minerals.

In the other determinative tables the minerals were listed according to increasing reflectance. Measured values supplemented by visually established differences in reflectance were used. Data for about 250 minerals – the then known ore minerals – were given. The compilation was based on 441 references in addition to the work of the author himself.

With his publication Uytenbogaardt added much to the understanding of the value of quantitative methods in the study of ore minerals. An important new step in this direction came in 1962 with the establishment of the Commission on Ore Minerals (C.O.M.) under the International Mineralogical Association (I.M.A.). Quantitative methods became of central interest to students of opaque materials.

The first edition was soon sold out. In 1968 a facsimile was published, thus underlining the strong demand for this book. A fully revised and up to date edition had been planned for some years but the preparation of the new edition of the Tables encountered many problems because of the explosion-like development within the field in those years.

Uytenbogaardt together with Burke had to face a vastly increased number of ore minerals – over 500 recognized and I.M.A.-accepted mineral species.

The second edition contains: Introduction (pp. 4), Part I: Determinative Tables (I to XII, pp. 29), Part II: Mineral Descriptions (pp. 327), References (1739 publications) and an index listing over 600 mineral names of which some ninety – specially marked – are considered superfluous.

In the Introduction the general principles of the Tables are stated and these are important reading to anyone wishing to use the Tables. Even more important is to note that the authors give here the procedures recommended by the C.O.M. for the determination of micro-indentation hardness and reflectance.

In the first of the Determinative Tables ore minerals are listed in order of increasing minimum micro-indentation hardness (VHN). This Table contains about 350 species. An alphabetic list of 167 ore minerals for which micro-indentation hardness has not yet been determined ends the Table.

In the second Table minerals are listed in order of increasing minimum reflectance in air. The table contains about 400 species. A list of 80 minerals for which reflectance data are not yet available ends the Table.

The third Table contains the ore minerals listed in order of increasing polishing hardness. The authors still regard this property as a useful guide to the classification of minerals in reflected light microscopy and the mineral description tables in Part II give the minerals in this sequence alone.

Each of Tables IV to XII contains a specific mineral group: selenides; tellurides; sulphosalts with Ag and with Ag–Fe, Pb–Sb and Pb–As; Sn-sulphosalts and Sn-sulphides; platinoid minerals; oxidic manganese minerals.

The listing of the minerals in these Tables has been carried out according to available data and often several lists are given. In these Tables are also noted composition, degree of anisotropy (optical), hardness and reflectance in so far as these properties are available.

The appearance of the electron microprobe has rapidly changed the conventional pattern of approach for many ore microscopists. For those having access to a microprobe these tables represent a most welcome short-cut in the work of identification.

Part II: Mineral Descriptions takes up the major part of the book. In tabular form with 5 columns it briefly gives information about the minerals in the first Tables. It should be noted, as the authors mention in the Introduction, that completeness in description was not the aim. Complete data can be found elsewhere.

One column contains name, formula and crystal system of the mineral. The next two columns contain data on reflectance and hardness. The optical appearance of the mineral is characterized in a fourth column. This covers colour bireflectance, anisotropy (degree of) and internal reflexions. The colour of a mineral under the reflecting microscope very much depends on the surroundings of the mineral. It is therefore of special importance to note that the authors always give the colour-character as seen against minerals with which the mineral in question often occurs.

The last column contains remarks on grain shape, cleavage, relationship to accompanying minerals and a variety of notes of importance for verifying the identity of a mineral. For the student who wishes to consult original papers on the topic numerous references are given for every mineral both here and in the other columns.

To sum up, this is a book which everybody working with ore minerals will wish to have available because it contains quantitative data for most minerals met with in ores. This aspect of the book is also its weakness. Often quotations from different sources give varying values both for hardness and for reflectance. The authors are aware of this and all of us look forward to see the results of the International Tables on quantitative data which represents one of the major tasks for the C.O.M. at present. When these data for a sufficient number of minerals are available it should not be too difficult to enter them into the tables. One could also wish that the authors had made a few improvements in other parts of the book. Table III has information on the degree of anisotropy and also gives the formulae of the minerals. Tables I and II give only – after the name – the micro-indentation hardness and the range of reflectance respectively. It might also be useful in these Tables to have the properties given in Table III. Consultation of the determinative tables might thus be minimized and, of course, one might also think it worthwhile to focus on these tables containing the quantitative data.

In the old edition the common minerals were printed with capital letters. In this edition only galena, chalcopyrite and pyrite are so marked. Many users of the book might find it pleasant to be able to pick out rapidly the common minerals.

At one particular point I cannot fully agree with the authors: they recommend as a standard way of studying polished sections the use of oil-immersion. I admit that oil-immersion should be used at some stage of the examination because it brings out certain features which cannot be observed in air. Reflectance is measured usually in air; measurements in oil serve special purposes. Also other observations have to be carried out in air. So because identification of most minerals can be carried out without the use of oil-immersion I would prefer it if the authors would modify their point of view in this respect. These are minor things compared with the fact that in the second revised edition of the Tables we have the most comprehensive collection of quantitative data on ore minerals. The authors must be congratulated on finishing this important publication.

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