

of diopside, CaO.MgO.2SiO_2 . On further heating, åkermanite forms by reaction of the merwinite and glass residue and gives rise to the second exothermic peak on the d.t.a. curve. An endothermic peak appears when the åkermanite melts.

The above temperatures were obtained at a heating rate of 450°C/min . At a heating rate of 1600°C/min , these temperatures become 950°C and 1060°C respectively for the exothermic peaks and 1400°C for the endothermic peak (melting point). Heating rates slower than 450°C/min result in broad flattened-out peaks where it is impossible to determine the point of first deviation from the baseline as drift is always present. Slow step-wise temperature increases and observation through the microscope show that merwinite crystallizes from the glass after approximately 15 minutes at 830°C . The change of merwinite to åkermanite cannot be observed as the material is opaque after the first devitrification.

D.t.a. curves of partly crystalline åkermanite have only one devitrification peak corresponding to the second exothermic peak of fig. 1. This shows that åkermanite forms directly from the glass when crystallites are present. In this instance the peak area is of course smaller than when glass was used as a starting material.

*National Building Research Institute,
Council for Scientific and Industrial Research,
P.O. Box 395, Pretoria,
Republic of South Africa.*

G. R. BASSON

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BOOK REVIEWS

HEINRICH (E. W.), *Microscopic identification of minerals*. New York (McGraw-Hill), 1965, xiii+414 pp. and coloured birefringence chart. Price: 84s.

The book aims at providing a text for the identification of rock-forming minerals in thin section, in crushed fragments (immersion method) and in detrital grains. Inevitably the book prompts comparison with *Optical Mineralogy* by Kerr (1959), which covers the same ground, appears in a similar format and is from the same publisher. Both books cover the main topics of a university course in determinative optical mineralogy and differ only in the relative treatment of theoretical aspects.

Part 1 (44 pp.) contains two chapters of general information, mainly on immersion media, preparation of mounts, and staining procedures. Chapter 3 considers shape and optic orientation of minerals, followed by a brief Chapter 4 on elementary chemical aspects of isomorphism. Information on the *theory* of convergent light and the indicatrix is omitted and Chapter 5, which deals with immersion identification technique, illustrates very satisfactorily the relationship of the principal optic vibration directions (and hence R.I.) to various types of interference figure.

Part 2 contains the descriptions of minerals and is well illustrated with line drawings, photomicrographs, variation diagrams, and drawings of detrital grains. A coloured birefringence chart is also included in the book. The data on the various minerals is well presented, up to date, and there is generally more information on variations within mineral groups than in Kerr.

The problem facing the reviewer is whether this book represents (at its not inconsiderable price) any significant advance on existing texts. Perhaps the final criterion is the degree to which the reader is prepared to forgo the theoretical aspects of optical mineralogy for its practical application.

T. W. BLOXAM

BRANCAZIO (P. J.) and CAMERON (A. G. W.), editors. *The origin and evolution of atmospheres and oceans*. New York (Wiley), 1964. xii + 314 pp. Price: 94s.

This book contains the proceedings of a conference held at the Goddard Institute for Space Studies of the National Aeronautics and Space Administration in April, 1963. There are seventeen papers, some followed by discussions, which fall under the several general headings of: processes by which gases escape from the earth's interior to form terrestrial oceans and atmosphere; processes leading to alterations of the atmosphere such as chemical reaction with surface rocks, biological interactions and thermal escape; the gas content of meteorites and its significance in relation to the earth's history; and seven papers on the atmospheres of other planets.

T. W. BLOXAM

CRAIG (G. Y.), editor. *The geology of Scotland*. Edinburgh (Oliver & Boyd), 1965. xv + 556 pp. Price: 105s.

The book contains fifteen contributions by various authors on several major topics of Scottish geology: 1. The geological growth of Scotland (T. N. George); 2. Lewisian (J. Watson); 3. Torridonian and Moinian