chlorosulfonylphenyl)-isoxazole in 2/1 ratio], alkylation of the resulting mixed sulfonyl chlorides in methylene chloride by triethyloxonium fluoroborate,[5] ready separation, by crystallization from acetone/ether, of pure N-ethyl-5-(3′-chlorosulfonylphenyl)-isoxazolium fluoroborate [m.p. 161–162°. Found: C, 36.97; H, 3.22; N, 3.79; S, 9.02], and hydrolysis of the latter by 2 *N* aqueous-alcoholic hydrochloric acid at room temperature.

(5) H. Meerwein, E. Battenberg, H. Gold, E. Pfeil and G. Willfang, *J. prakt. Chem.*, **154**, 83 (1939).

We wish to express our appreciation of support by the National Science Foundation and the National Institutes of Health.

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RECEIVED JANUARY 13, 1961

BOOK REVIEWS

Graphite and its Crystal Compounds. By A. R. UBBELOHDE, Professor of Thermodynamics, Imperial College of Science and Technology, London, and F. A. LEWIS, Lecturer in Inorganic Chemistry, Queen's University, Belfast. Oxford University Press, 417 Fifth Avenue, New York 16, N. Y. 1960. xii + 217 pp. 16 × 24 cm. Price, $5.60.

The authors state that "this book aims to give descriptive access to current lines of research without attempting definitive treatments where these are considered to be premature." Such a statement disarms criticism since in fact no aspect of the subject can be considered to have reached definitive maturity. The book therefore provides a selective, classified and cautiously annotated bibliography, which surveys the literature to about the middle of 1959. Little effort has been made to select significant papers for especially detailed discussion or to provide theoretical background to help interpret the topics mentioned. The book is primarily designed not to provide scientific information but to provide references to sources of information.

The general level of the treatment can best be conveyed by quoting a typical paragraph.

> A treatment has been proposed alternative to the tight binding theory originally introduced by Wallace (*cf.* also Yamazaki, 1957). In this approach (Slonszewski & Weiss, 1955) a detailed group theory study of the crystal is made, in order to obtain the 'topology' of the bands. In view of the large spacing between the layers the interlayer interaction is treated by perturbation theory; this leads to a model of the energy bands which involves only a small number of parameters to be obtained by experiment. No satisfactory correlation has been found between this model and the value of the absolute magnetic susceptibility found experimentally (McClure, 1959). In application of this model to explain the results of cyclotron resonance in graphite (Nozieres, 1958) much experimental information is reviewed.

The contents are divided as follows: crystallography, physical properties, thermal properties, electron properties and band structure, crystal compounds of graphite, magnetic and electrical properties of the crystal compounds, graphite oxide, and chemical transformation of graphite to volatile products.

The treatment of the crystal compounds of graphite is exceptionally good. In general, the chemistry in this book is more adequate than the physics.

Since the book is not expensive, we can safely say that it provides good value. It may easily save many hours of time for anyone in need of a ready reference to the properties of graphite and its crystal compounds. On any particular topic, however, the original papers will need to be consulted. In order to make sure that nothing important has been missed, recourse to "Chemical Abstracts" will also be required. (This book contains about 600 references, and in 1958 alone "Chemical Abstracts" contained more than 400 references to graphite.) The system of placing the references in the text between parentheses makes the book difficult to read for any length of time.

A student wishing to obtain a good idea of the current status of this field would not be advised to turn to this book. He would do better to read some of the papers in the Proceedings of the Third Conference on Carbon, held in 1957 and published in 1959. In these papers the subject immediately becomes alive and meaningful.

The book has been beautifully printed by Vivian Ridler of the Oxford University Press. The editing has been somewhat careless, particularly in the failure to provide sufficiently descriptive captions for some of the figures, tables and illustrations. In the review copy, the paper varied in color. A slight lowering of the standards of the Oxford Press is therefore evident. In any case, one must question the value of such a monumental production for a book whose useful life can hardly be more than five years.

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Radiation Pyrometry and its Underlying Principles of Radiant Heat Transfer. By THOMAS R. HARRISON, Technical Advisor, Minneapolis-Honeywell Regulator Co., Brown Instruments Div.; formerly Director of Research, The Brown Instrument Co.; Physicist, Champion Porcelain Co.; Associate Physicist, National Bureau of Standards. John Wiley and Sons, Inc., 440 Fourth Avenue, New York 16, N. Y. 1960. xii + 234 pp. 16 × 23.5 cm. Price, $12.00.

The title is admirably descriptive of this admirable book. The author, an authority on the technique of radiation pyrometry, states his prime purpose is to present the information needed to enable engineers to arrive at definite answers to questions arising in connection with the use of radiation pyrometers in industry. This he has done notably, but his accomplishment is much greater. To give the theoretical and practical explication of radiation pyrometers and pyrometry that he does, the author (a) presents and develops concisely and accurately the chief principles and ramifications of energy transfer by thermal radiation; (b) adopts a single, sound and acceptable terminology on the subject, which has been rather needed; (c) distinguishes clearly the multifarious concepts of spectral, total and band, and normal, angular and hemispherical, emittances, absorbtances and reflectances of bodies, and their interrelationships; and (d) gives tabulated values of Planck's radiant intensity functions, in a convenient and condensed form. This compendium, although here focused on pyrometer practice, is directly applicable, and sufficient in principle, for the broader universe of radiative heat transfer problems.

The mathematics of the subject, and the equations required in pyrometer applications, are concisely and (with appendices) very completely developed. About a half of the text is devoted to particulars on different types of pyrometers and optical systems, including "light-guide" pyrometers, and the equations and factors on which their calibrations are based. Six tables give data on the emittances of materials, and optical properties of pyrometer lens and window materials; twelve tables give calibration data for particular pyrometers, and relative responses resulting with combinations of different lenses and windows; corrections for the emittance of objects sighted upon are presented in