

it is observed and as analysis fills out observation. Chapter 4 extends our knowledge to the sun's interior, outlining the brilliant theoretical attack (to which Gamow himself contributed significantly) that has resulted in our now knowing more about the interior of the sun than we know about the interior of the earth. Chapter 5 gives our present understanding of the nuclear sources of solar energy. Chapters 6 and 7 turn from the individual sun (a middle-class, middle-aged star) to all the stars and consider their numbers, their varieties, and their life history.

This is the latest of Gamow's popular expositions of science. It has the Gamow virtues—direct chatty style, masterful use of analogy, vivid examples, clarity. It has also carelessness in detail that leads to occasional misstatements—for example, "the hydrogen absorption lines must be all but absent in the Fraunhofer spectrum" (p. 67), although the figure on page 31 shows these same lines among the strongest in the spectrum. And more seriously, it deliberately touches up historical and biographical details for effect, as an after-dinner speaker embroiders anecdotes—for example, the argument of Anaxagoras on the sun's distance (p. 3). Although Anaxagoras *might* have reasoned in this way, no actual record warrants this account. Finally, our knowledge of the sun has even today more "if's" and "perhaps's" than Gamow suggests. But if you are interested in the sun, read and enjoy this book.

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## Chemical Technology

**Organoboron Chemistry.** vol. 1, *Boron-Oxygen and Boron-Sulfur Compounds*. Howard Steinberg. Interscience (Wiley), New York, 1964. xxxii + 950 pp. Illus. \$33.

*Organoboron Chemistry*, volume 1, by Howard Steinberg, vice president and director of research for the U.S. Borax Corporation, contains 21 chapters covering all aspects of boron-oxygen and boron-sulfur chemistry. Volume 2 will treat the nitrogen compounds of boron, and volume 3 will cover the boron-carbon bonded compounds. The literature for volume 1 is covered from the

beginning of work in this area to 1 January 1962. The monumental task encountered by the author is reflected in the 1709 references cited.

The subject matter is well organized. Chapters 1 and 2 are devoted to introductory material; chapter 3 is concerned with nomenclature; chapters 4 through 20 consider systematically and separately each specific class of compounds in which boron is attached to oxygen or sulfur (but not, at the same time, to carbon); and chapter 21 discusses hydrolytic stability of boron oxygen compounds. Particularly well presented and informative are chapters 3, 4, and 21. Chapter 3, "Nomenclature," contains the rules of nomenclature adopted for this book. This presentation is based on an American Chemical Society report, "The nomenclature of boron." The discussion presented in this chapter will hopefully help to systematize future nomenclature in this area. Chapter 4, "Symmetrical orthoborates of monohydric alcohols and phenols," covers the area that can be considered the backbone of boron-oxygen chemistry. The chapter contains more than 500 references and is by far the most comprehensive treatment of this important subject available anywhere. Chapter 21, "Hydrolytic stability," discusses a subject that, in recent years, has become increasingly important and interesting to those concerned with the applications of boron compounds. Singling out these chapters should in no way indicate that the other chapters are not as well written or informative. Undoubtedly each reader will prefer those chapters which reflect his own personal interests.

This is, of course, a comprehensive reference book rather than a textbook. However, the author presents mechanisms for many of the important reactions and discusses the merits of each mechanism in detail. What is perhaps an even more unusual feature is the author's evaluations of mechanisms reported in the literature. If a mechanism does not seem logical, or does not explain the facts in hand, the author proposes a mechanism of his own. And so the book is, to some degree, a treatise in which one can find an evaluation of boron-oxygen and boron-sulfur chemistry as well as a compilation of voluminous factual data.

There can be little question but that the author has succeeded in gathering, summarizing, and at times evaluating the tremendous amount of work in which the chemistry of boron-oxygen

and boron-sulfur compounds are described. If the other volumes in this series maintain the same high caliber reporting, the series should represent an excellent standard reference on organoboron chemistry for many years to come. This volume represents a job well done, and I heartily recommend it as the most comprehensive source of information available in the areas of organoboron chemistry covered.

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## Solid-State Physics

### Low Temperature Solid State Physics.

Some selected topics. H. M. Rosenberg. Oxford University Press, New York, 1963. xvi + 420 pp. Illus. \$10.10.

A person shopping around today for a book on solid-state physics, of either the general or specialized varieties, has a large selection from which to choose. In view of this happy circumstance, one might seriously question whether one more book is worth the effort. However, one might expect a warm welcome to be accorded the present book. The author's credentials are known, and he has produced a general treatise covering only a few topics which are of particular interest to him, topics that are also largely at the forefront of present-day research on solids. Whether the reader feels that his expectations are fulfilled, though, probably will depend on his personal tastes vis-à-vis books of this kind.

Rosenberg has not written a textbook; neither has he written what the expert would regard as a particularly good reference book. He has written, however, a very good "cultural" or background book and by so doing has filled a definite present-day need. The tyro in solid-state physics today need never fear that he will not encounter the full mathematical development of the phenomena of solids. What the beginner usually does not encounter is a treatment with the mathematical facade stripped away and the phenomena presented as just plain physics. The author regards experimental observations as fundamental. He presents the lore of several important areas and proceeds to explain and unify things, using essentially physical reasoning. The results of elegant calculations are pre-