

read the text more carefully—if he doesn't, he might miss something comical!) An especially attractive feature is the number of humane warnings about pitfalls and tough points. (On page 317, "The result . . . is correct and important. The derivation given is a fraud and a hoax." On page 379, "Although we shall review some of the mathematical operations, it is doubtful that readers who are unfamiliar with the elementary aspects of matrix algebra can profit from this section.")

On the negative side, there are a few places where one might wish for more clarity or detail, or a change in emphasis. On page 24 a rule is given for constructing quantum mechanical operators; on the following page it is qualified, and in fact only the qualified rule, called "safe" by the author, is correct. The name "Boltzon" is coined on page 36. This seems at first to be a useful addition to Fermion and Boson, until one realizes that all particles in nature are either of the latter, and that no Boltzons exist. The statement on page 91 that a single particle function  $q$  is not an intensive quantity, while  $q/N$  is intensive, is confusing. The principles of detailed balancing and microscopic reversibility are lumped together in a single statement (page 233) and are not carefully distinguished; this is a common source of semantic confusion in statistical arguments. The discussion of lattice specific heats, and in particular the graph on page 368 of a typical frequency spectrum, is somewhat out of date. It should include reference to the work of Van Hove, who showed that there are important discontinuities in such graphs.

In summary, this is an excellent textbook of practical statistical mechanics. Graduate students in physical chemistry are urged to become acquainted with its contents.

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**Gmelins Handbuch der Anorganischen Chemie. Achte Völlig Neu Bearbeitete Auflage. Calcium. Teil B—Lieferung 3. Schluss der Verbindungen Chemisches Verhalten des Calcium-Ions Nachweis und Bestimmung von Calcium, Strontium und Barium. System-Nummer 28.** Edited by Gmelin-Institut. Begonnen von R. J. MEYER. Fortgeführt von E. H. ERICH PIETSCH. Verlag Chemie, G.m.b.H., Pappelallee 3, Weinheim Bergstr., Germany. 1961. lxii + 912 pp. 18.5 × 25.5 cm. Price, DM. 568.— (\$142.00).

Part B, Section 3, of the volumes dealing with calcium, completes the summary of calcium compounds, discusses the reactions of the calcium ion, and summarizes the detection and determination of calcium, strontium, and barium. Treatment of the compounds begins with the calcium-sulfur-oxygen system and continues according to the well-established Gmelin pattern through the binary and ternary compounds of calcium with the non-metallic elements of Groups VI, V, IV, and III. Reactions of the calcium ion include those with both inorganic and organic species. Both qualitative and quantitative analytical approaches are described, and many procedures applicable to specific substances or products are outlined. Throughout, all items have been particularly carefully and critically documented. The inclusion of a Table of Contents and marginal indexing in English—now standard practice in the Gmelin series—makes the contents of the volume even more accessible than they would normally be.

The general treatment presents a wealth of detailed chemical and physico-chemical information. Usual data of the latter type are supplemented by an extensive treatment of phase diagrams involving a variety of calcium-containing systems. It is most unlikely that any aspect of the areas covered has been slighted.

This volume is a worthy addition to the Gmelin series. As a source of useful and correct information, it has no competitor. The printing, binding, appearance and general presentation are attractive and practical. It is recommended without reservation to anyone seeking information in these areas.

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**Gmelins Handbuch der Anorganischen Chemie. Achte Völlig Neu Bearbeitete Auflage. Kobalt. Teil A. Ergänzungsband. System-Nummer 58.** Edited by Gmelin-Institut. Begonnen von R. J. MEYER. Fortgeführt von E. H. ERICH PIETSCH. Verlag Chemie, G.m.b.H., Pappelallee 3, Weinheim/Bergstr., Germany. 1961. lxxii + 886 pp. 18.5 × 25.5 cm. Price, DM. 556.— (\$139.00).

Part A of the volumes on cobalt presents a broad summary of the history, occurrence, technology, properties and alloys of the element, the chemical reactions of its ions, and the compounds it forms with both non-metallic and metallic elements. Included in the last category are many of the coordination compounds, but no attempt is made to treat these separately as a particular class of compounds. Each area is handled with the characteristic and highly commendable Gmelin thoroughness and comprehensive documentation. The volume is a definitive source of an almost unbelievably large amount of chemical and physico-chemical information pertaining to cobalt and its compounds. Access to this information is of course improved by the inclusion of a supplementary Table of Contents and marginal indexes in English.

Particular attention has been given both to recently published information and to physical data. The volume contains many tabulations, a large number of pertinent graphs and diagrams, and a substantial number of pictorial representations of crystal structures. All of these are included logically where they can best describe the substances in question.

It is difficult to discuss any volume in the new Gmelin series in other than superlatives. This is no exception. It is recommended as undeniably the best and most comprehensive compilation available on cobalt chemistry. No person or concern interested in any of the areas covered can afford to be without access to it.

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**Gmelins Handbuch der Anorganischen Chemie. Achte Völlig Neu Bearbeitete Auflage. Kupfer. Teil B—Lieferung 2. Verbindungen bis Kupfer und Wismut. System-Nummer 60.** Edited by Gmelin-Institut. Begonnen von R. J. MEYER. Fortgeführt von E. H. ERICH PIETSCH. Verlag Chemie, G.m.b.H., Pappelallee 3, Weinheim/Bergstr., Germany. 1961. xli + 352 pp. 18.5 × 25.5 cm. Price, DM. 231.— (\$58.00).

This volume in the series on copper describes, according to the well-established Gmelin sequence, the binary and more complex compounds of the element based upon boron, carbon, silicon, phosphorus, arsenic, antimony and bismuth. Understandably, the major amount of space is allotted to the copper(II) salts of the organic acids. The treatment throughout is comprehensive and definitive, with emphasis being divided between descriptive information and physical data. Coordination compounds and complex ions are discussed as the ligands from which they are derived are treated, but not in separate sections. Graphic representations of structure and phase diagrams are included where data are available.

All of the virtues of meticulous attention to detail, comprehensiveness, direct and up-to-date literature citation, and clarity of presentation that characterize the Gmelin series are apparent for this volume. These are complemented by the inclusion of a Table of Contents and marginal indexing in English. Although the area encompassed is somewhat limited, the volume is a "must" for any technical library and a highly recommended source for any person who is pursuing copper chemistry.

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**The Metal Plutonium.** EDITED BY A. S. COFFINBERRY and W. N. MINER. The University of Chicago Press, 5750 Ellis Avenue, Chicago 37, Illinois. 1961. xi + 446 pp. 16.5 × 24.5 cm. Price, \$9.50.

The chapters of this book were originally presented as papers at the 1957 World Metallurgical Congress in Chicago