have worked on the same problem, Rochester tabulates all sets of results; where differences exist—of fact or opinion—he tries to be fair to all sides. His coverage of the literature is remarkably complete, and I found no serious errors. The index is well done. Indeed, my only criticism is minor and subjective: Since the success of acidity functions depends on the existence of certain linear free energy relationships, I was disappointed that almost nothing is said about linear free energy correlations in general.

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Organic Compounds

Nonbenzenoid Aromatics. Vol. 1. JAMES P. SNYDER, Ed. Academic Press, New York, 1969. xii, 372 pp., illus. $17.50.

A theoretical basis for investigating the structures of nonbenzenoid aromatic compounds was provided by E. Hückel in 1931 at the time of the formulation of the pi-electron theory of aromaticity, but in a real sense the subject developed after World War II and is thus relatively new. In the space of approximately 20 years a wide variety of molecular species containing from 2 to 30 pi electrons and existing as cyclic cations, anions, radicals, or zwitterions, in complexes, or as more ordinary neutral conjugate unsaturated systems, for the most part previously unknown, have been synthesized and studied. This work has evoked an impressive total of theoretical interpretation and prediction aimed at understanding the general structure-properties relationship for this class of compounds.

Although there have been a number of review articles, especially in the past ten years, the only previous major survey of the field is *Non-Benzenoid Aromatic Compounds,* edited by David Ginsburg, which appeared in 1959. Thus the present work, which (reflecting the large increase in the literature that has occurred) will consist of several volumes to be published over a period of several years, is timely and will provide when complete an authoritative picture of, one hopes, all the significant areas. The size and complexity of the task precluded the appearance of all the volumes in the same year and also made it impracticable to have the contents of the individual volumes organized so as to be homogeneous, or fairly so. This is quite apparent in this first volume, which contains chapters, following a historical introduction by the editor, treating biphenylenes, cyclodecapentaene, sydnones, azepines, oxapins, thiepins, and aromatic oxocarbons.

The authors of this volume have achieved a good balance between experimental results and theoretical interpretation. The scope and detail of the chapters are adequate, but do not give the impression of including a reference to every paper that has appeared. An author index makes the search for a topic by this route possible. The subject index would be more useful if it were more detailed. The format, type, drawings of chemical structures, paper, and binding are excellent.

It may be expected that this book and its companion volumes will become the principal general source in the field.

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Magnetic Properties

Magnetism and Metallurgy. AMI E. BERKOWITZ and ECKART KNELLER, Eds. Academic Press, New York, 1969. 2 vols. xxviii, 838 pp., illus., + indexes. Vol. 1 (pp. 1–512), $29.50; vol. 2 (pp. 513–838), $17.

Magnetism and Metallurgy is a two-volume treatise on how structural properties affect magnetic phenomena, and to a lesser extent it explores the use of magnetism in the science of metallurgy. It is not the intent of the work to be a comprehensive treatise on the physics of magnetism. Introductory sections dealing with the principles of magnetism and experimental techniques provide the desired degree of self-containment. These sections are generally well referenced so that the reader can readily pursue topics that are outside the scope of the work.

The main purpose is to examine the effects of composition and a wide range of defects on the magnetic properties of materials. In particular the effects on magnetization curve parameters are dealt with extensively. Although the introductory section refers to some aspects of magnetism as a phase transition and mentions that interesting thermodynamic and transport anomalies exist near the Curie or Néel temperature, treatment of the role of composition and defects is confined almost exclusively to saturation magnetization, coercive force, remanence, energy products, and the like. These structural effects are considered primarily for ferromagnetic systems and in particular for transition metals and alloys. Complicated spin structures such as the screw types found in the rare earths, their alloys, and intermetallics are mentioned only briefly. In any work of this nature there exists the danger of merely cataloging behavior observed in a wide range of elements, alloys, and intermetallics. Only four of the chapters are of this nature, however. The remaining 13 are quite descriptive and oriented toward the phenomena. Of course sometimes significant results are not well understood and one must catalog or omit.

Discussion of the role of composition in binary and ternary solid solutions and intermetallics is confined to susceptibility and magnetization curve parameters, primarily in noble-transition metal, simple-transition metal, transition-transition metal, and transition-metal-rare-earth systems. Discussion of the role of defects is also confined primarily to magnetization curve parameters. The types of defects considered include finite size, dilute concentrations of nonmagnetic impurities, dislocations, stacking faults, point defects, agglomerates of both magnetic and nonmagnetic species, and atomic disorder especially near an intermetallic stoichiometry. In addition, the production of defects by working and the introduction of directional order by heat treatments in fields are discussed, as is the kinetics of defect recovery and recrystallization.

Several chapters are excellent. S. H. Charap provides a compact introduction to the range of magnetic behavior that occurs throughout the periodic table, introducing molecular field and band approaches. The main aspect of each type of behavior is clearly described, and reference to more thorough works is made straightaway in each instance. The chapter by P. E. Seiden on magnetic resonance is a model of succinct presentation of an intrinsically complex subject. A chapter by T. R. McGuire and P. J. Flanders provides an extremely handy survey of how to measure susceptibility, magnetization, magneto-optical, and galvanomagnetic properties. Immediate reference to an appropriate review article is made for each topic. How to determine transition temperature, effective number of magnetons, and exchange integrals is clearly