

CID process and to explore selected ion fragmentation applications in mixture analysis and structural elucidation.

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#### References and Notes

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## Book Reviews

**Spectroscopic Properties of Inorganic and Organometallic Compounds. Volume 7.** Edited by N. N. GREENWOOD (Department of Inorganic and Structural Chemistry, University of Leeds). The Chemical Society, Burlington House, London. 1975. 699 pp. £24.00.

This the seventh volume in a continuing series devoted to the subject literature published during 1973. There are eight reviews in this volume, as follows: "Nuclear Magnetic Resonance Spectroscopy" by B. E. Mann; "Nuclear Quadrupole Resonance Spectroscopy" and "Microwave Spectroscopy" by J. H. Carpenter; "Vibrational Spectra of Small Symmetric Species and Single Crystals" by D. M. Adams; "Characteristic Vibrational Frequencies of Compounds Containing Main-group Elements" by S. R. Stobart; "Vibrational Spectra of Some Co-ordinated Ligands" by G. Davidson; and Mössbauer Spectroscopy by R. Greatrex.

As in past volumes of this series, a thorough compilation of the literature has been achieved. Because of the extensive number of books and papers involved, only very brief reference to each article can be made. However, by means of the many references listed, the reader can use the review to find details of relevant procedures and information in the papers cited.

In general the structure of the individual chapters has followed that of previous volumes. Changes are to be found in the chapter on NMR spectroscopy regarding discussion of techniques, coupling constants, chemical shifts, and relaxation measurements in that they have been omitted from the introductory section and absorbed into the rest of text. A new section in this chapter on metals in biological systems has been added.

James L. McAtee, Jr., *Baylor University*

**Organic Syntheses via Metal Carbonyls. Volume 2.** Edited by IRVING WENDER (Pittsburgh Energy Research Center) and PIERO PINO (Swiss Federal Institute of Technology). John Wiley & Sons, Inc., New York, N.Y. 1977. xiii + 743 pp. \$45.00.

This well-produced book is the second volume of the series, the first of which was published in 1968. Topics include carbonylation of various organic substrates, organic synthesis with iron pentacarbonyl, and decarbonylation reactions. The chapter on hydroformylation appears particularly thorough. The later chapters on hydrosilylation and symmetry restricted reactions although interesting contain few references to metal carbonyl complexes.

Since there are many contributors there is a range of style of treatment and some overlapping of material. The main criticism is that many of the articles were written several years ago and the more recent literature (up to mid-1975) is covered in brief supplements. This

results in the main review not being interpreted in the light of current available evidence, particularly mechanisms. The use of the newer metal carbonyl derivatives such as Collman's reagent, carbene complexes, or cluster compounds receive only the minimum of coverage. However, synthetic organic and organometallic chemists, who have often ignored the potential use of transition metal complexes in organic synthesis, should find this book valuable, especially since homogeneous catalysis is currently an area of intense research.

R. K. Pomeroy, *Simon Fraser University*

**Excited States of Biological Molecules.** Edited by J. B. BIRKS (University of Manchester). John Wiley & Sons, New York, N.Y. 1976. xviii + 652 pp. \$45.00.

This book is based on the Proceedings of the International Conference on Excited States of Biological Molecules, held in Lisbon, Portugal, April 18-24, 1974. The conference was divided into six sessions, each introduced by a plenary lecture, as is the book. The six sections are: (A) excited states of organic molecules (Sir George Porter) which is subdivided into (A1) primary processes and (A2) photochemistry and photobiology; (B) excited states of DNA and nucleotides (C. Helene); (C) excited states of photosynthetic pigments (H. T. Witt); (D) excited states of proteins and amino acids (G. Weber); (E) excited states of visual pigments (B. Rosenberg); (G) energy transfer in biological molecules (J. Eisinger). Texts of the plenary lectures are included plus most of the 73 contributed papers. The remainder are present in the form of an abstract only.

This is the fourth book in a series devoted to the photophysics of organic molecules. This volume suffers in comparison to the first three of the series. The previous volumes consist of high quality review chapters, which are effectively coordinated to give coherent coverage of the subject. Equally effective coordination of a large collection of presentations is made difficult by the diversity of topics plus their variation in quality. The meeting must have been very stimulating, and this collection communicates that to the reader. While it is not possible or desirable to report on all the papers, suffice it to say that many readers will find interesting reports here and should have access to it through a library.

David F. O'Brien, *Research Laboratories  
Eastman Kodak Company*

**Organolithic Macromolecular Materials.** By ALAN D. WILSON and STEPHEN CRISP (Laboratory of the Government Chemist, London). Applied Science Publishers, Ltd., Barking, Essex, England. 1977. ix + 298 pp. \$32.00.

This brief text deals with macromolecular materials which are hybrids containing both an organic polymer moiety and an inorganic silicate moiety. Because this topic is at the boundary between organic and inorganic chemistry, treatment has frequently been slighted or completely ignored in texts on polymer chemistry.

The first two chapters review the fundamentals of ionic and covalent bonding and how differences in bonding influence the chemical and physical properties of macromolecules. Naturally occurring silicates are classified according to structure and chemical properties. Polymerization of organosilicon compounds and of organic monomers is concisely summarized. The definitions and classifications found in these two chapters are very clearly stated and easily understood.

The last four chapters deal with recent developments in the applied aspects of these hybrid polymers. Widely diverse areas are covered: glass-ionomer cements and their use in dentistry; polymer-clay compounds in soil treatment; and polymer-cement composite materials used in construction. The simplicity of the first two chapters is maintained in the attempts to explain in structural terms the properties of these complex materials. An unusual feature which adds life to these chapters is the description of the experimental details for several of these interesting compounds. The handling of the references is also noteworthy. Each reference is annotated with either the title or a brief description of the contents.

The fundamental treatment of these complex structures and processes recommends this book to the widest possible audience.

Daniel H. O'Brien, *Texas A&M University*

**Electrical Phenomena at the Biological Membrane Level.** Edited by E. ROUX. Elsevier Scientific Publishing Co., Amsterdam. 1977. xvi + 565 pp. \$65.50.

This book consists of 40 papers presented at the 29th international meeting of the Société de Chimie Physique, Orsay, 12-15 October, 1976. The original typescripts are reproduced followed typically by one page of discussion by the participants.

The purpose of the meeting was to bring together physiologists and physical chemists for the exchange of latest advances in the theory and methodology related to electrical phenomena in biological membranes. The range of topics covered almost defies summary short of listing the titles. Results are presented for nerve, erythrocyte, yeast, nitella, slime mold, visual and chloroplast membranes, as well as various bilayer and monolayer model membranes. Brief reviews of membrane structure and theoretical papers on permeability, electrical membrane noise, and electron transfer are presented. In addition to a great variety of electrical methods, applications of fluorescence and osmotic pressure are discussed. There are several papers on the membrane interactions of hormones, polypeptides, and other macromolecules.

Generally the papers are well written, adequately illustrated, and referenced into 1976 (five of the papers are in French). The interdisciplinary nature of the meeting seems to have evoked unusual clarity from both the chemists and the biologists. The book would serve as a good introduction to both theoretical and experimental aspects of numerous areas of current membrane research.

Stephen E. Schullery, *Eastern Michigan University*

**Examination and Analysis of Starch and Starch Products.** By J. A. RADLEY. Applied Science Publishers. Essex, England. 1976. vii + 220 pp. \$40.00.

Chapters 1 and 2 of this book describe the microscopy of starch. The first chapter has excellent photomicrographs of starches from different sources with general discussions describing the differences. Techniques of transmission and scanning electron microscopy are described in Chapter 2 along with some excellent electron micrographs. The methods and problems of determining the rheological properties of starch are examined, and the need to have standard procedures for determining these properties is pointed out. The physical methods of characterizing starch including viscosity, alkali fluidity, color, odor, hydrogen ion activity, and moisture are examined, and the various methods of measuring viscosity are described. In the chemical analysis section of the book methods are given for the determination of various metals, fat and protein content, acidity, alkali-labile value, alkali number, and iodometric determination of amylose. Several methods for the determination of starch in various products are given, and a short section covering the examination of starch ethers and esters is included.

The sections of the book vary as to the detail given for each subject; that is, in some instances actual procedures are given and in others the subject is only generally discussed. The book gives a good indication of the problems associated with the analysis and characterization of starch. Most sections include an extensive bibliography.

Edward I. Stout, *Northern Regional Research Center  
Peoria, Illinois*

**Alicyclic Chemistry. Volume 5.** Senior Reporter: W. PARKER (University of Stirling). The Chemical Society, London. 1977. ix + 439 pp. \$56.00.

The fifth volume in this Series of Specialist Periodical Reports offers a review of the 1975 literature of alicyclic chemistry. The volume contains over 2000 references, including multiple citations. Subject matter is arranged along structural lines in five chapters: "Three Membered Rings"; "Four Membered Rings"; "Five and Six Membered Rings"; "Medium and Larger Ring Compounds"; and "Bridged Carbocyclics". There are helpful subheadings to each chapter that facilitate retrieval of specific information. An author index is also included. The chapter dealing with "Five and Six Membered Rings" includes only material of theoretical and structural significance together with selected aspects of reactivity. Coverage is comprehensive in the remaining chapters. Each section is concise, very readable, and maintains the Chemical Society's high standards for reporting. The entire series is an asset to the research library. The value of these reports rests in their ability to provide rapid, comprehensive coverage to a large audience of chemists. The editors should give serious consideration to less expensive forms of printing together with hand-drawn structures as a means of achieving this goal.

Kenneth J. Shea, *University of California, Irvine*

**Prostaglandin Synthesis.** By JASJIT S. BINDRA and RANJNA BINDRA (Pfizer Inc.). Academic Press, Inc., New York-San Francisco-London. 1977. xii + 522 pp. \$24.00, £17.05.

This book is well planned and represents a comprehensive review of prostaglandin syntheses through mid-1976. The authors are to be congratulated in condensing the voluminous literature on prostaglandin syntheses into an organized and succinct survey. The book should prove not only of value to those engaged in prostaglandin research but should serve organic chemists in general as a compendium of organic reactions.

The book consist of 21 chapters. Additional selected reviews dealing with different aspects of prostaglandin research are listed in an appendix. A brief review concerning the biosynthesis, metabolism, historical isolation, and structure determination of the prostaglandins is given in the first two chapters. An added feature of this book is the excellent review on the nomenclature of prostaglandins presented in Chapter 3. In Chapter 4 approaches to prostaglandin synthesis and their commercial feasibility is briefly outlined.

Chapters 6 through 13 are comprehensive in dealing with the different synthetic strategies developed by various research groups in the total synthesis of prostaglandins. Similar synthetic sequences are grouped together, and their general applicability toward these ends are discussed. These syntheses are categorized as acyclic, cyclopentane, cyclopentane-conjugation addition, cyclohexane, bicyclohexane, bicycloheptane, bicyclooctane, and bicyclononane approaches to the E- and F-type prostaglandins.

The synthesis of the A-, B-, C-, and D-type prostaglandins are discussed in Chapters 14 through 17. The last four chapters deal with prostaglandin interconversions, isomeric prostaglandins, deoxyprostaglandins, and prostaglandin analogs.

This book is an excellent contribution to prostaglandin chemistry, and organic chemists interested in natural products and synthesis should find it of great value.

P. A. Zoretic, *Southeastern Massachusetts University*

**Biochemistry.** By LUBERT STRYER (Yale University). W. H. Freeman and Co., San Francisco, Calif. 1975. xiv + 877 pp. \$19.95.

This volume is one of a number of recent textbooks written for beginning students of biochemistry. The book is broadly divided into five areas, each of which is mostly self contained.

Part I deals with protein structure and biochemical activities derived therefrom. The author relies mainly on the classic examples of hemoglobin and myoglobin in presenting structural parameters. Discussions of enzymes, including the structure of active sites, substrate

specificity, kinetics, and mechanisms of reaction, focus on lysozyme and carboxypeptidase.

Intermediary metabolism and biochemical energy storage are outlined in Parts II and III, and in general the author has chosen to present a given pathway and comment in depth only on one or two of the more important enzymes involved. Readers more mechanistically inclined might wish to see added detail with regard to enzyme and coenzyme mechanisms for the given reactions, and a more comprehensive discussion concerning regulation and control of metabolism at various levels would be useful.

A well-rounded treatment of the molecules and mechanisms involved with genetic information is found in Part IV. Starting with descriptions of DNA and RNA, the author explains the genetic code and protein synthesis and presents the control of gene expression through a discussion of the lactose operon of *E. coli*.

Chapters in Part V, which correlate some of the concepts developed in earlier parts, are almost a set of special topics by themselves and include interesting presentations on immunoglobulins, bacterial cell wall structure, and the biochemistry of excitable membranes.

This volume is less detailed than some other current texts while it retains a good overall coverage of the field; this simplification succeeds in most cases, and bibliographies for each chapter appear adequate. Although the index is good, extensive cross-referencing within the text itself would be a valuable addition to assist the beginning student. Aside from photosynthesis, little reference is made to plant biochemistry, and many of the examples used suggest the text is designed primarily for medical or premedical students. It would seem to lend itself best to a one-semester course or a two-semester course if supplemented with readings from reviews and the primary literature. Its style and content make it an effective new book for students being introduced to the field of biochemistry.

Charles M. Tatum, Jr., *Middlebury College*

**Immobilized Enzyme Technology—Research and Applications.** Edited by HOWARD H. WEETALL (Corning Glass Works) and SHUICHI SUZAKI (Tokyo Institute of Technology). Plenum Press, New York, N.Y. 1975. ix + 321 pp. \$25.00.

This book is a collection of papers on immobilized enzymes presented at a seminar held in Tokyo, Japan, in November 1974. The conference was held as part of the United States–Japan Cooperative Science Program and emphasized practical aspects of immobilized enzyme systems. There were, however, several papers of a more basic nature concerned with use of immobilization for structure fraction studies of enzymes. Also included in this class were basic properties of a cellulase enzyme and applications of microencapsulation and radiation polymerization to enzyme immobilization.

The bulk of the other presentations were on enzymes or processes of industrial interest, including glucose isomerase, lactase,  $\alpha$ -amylase, amino acid synthesis, and engineering problems associated with these. There was a particular stress on diffusion and how it affected the performance of enzymes.

The strength in the volume lies in the fact that it brings together a lot of information of practical interest to the industrial and academic chemist in one place. It is unfortunate that it takes as long as it does to publish this as some has been published elsewhere. The sum of the papers, nevertheless, gives a realistic version of the state of immobilized enzymes as they are applied to large industrial reactions.

J. E. Alter, *Miles Laboratories, Inc.*

**Aromatic Compounds. Volume 3 (International Review of Science, Organic Chemistry, Series Two).** Edited by H. ZOLLINGER (Eidgenössische Technische Hochschule, Zurich). Consultant Editor: D. H. HEY. Butterworths Ltd., London–Boston. 1976. 350 pp. £13.45.

This volume is a continuation of a highly regarded series and contains ten review articles which mainly cover work published in the years 1972 and 1973, although relevant results published in 1974 and 1975 are included in some cases, and earlier work is also covered where applicable. All the chapters are well written and appear to be relatively free of typographical errors. The literature coverage is exhaustive and excellent.

In a philosophic and poetic review, Agranat and Barak explore “The Controversial Notion of Aromaticity” in the introductory chapter. They note that the concept of aromaticity is both ambiguous and complex. They consider various aspects of the field such as delocalization, Y-aromaticity, valence bond approach, aromatic-olefin

equilibrium, ring current criterion of aromaticity, and other topics. The recent advances described in chapters on “Arynes, Hetarynes and Newer Methods of Aromatic Nucleophilic Substitution”, “Photochemical Reactions of Aromatic Compounds”, “Microcyclic Compounds”, “Troponoids, Heptafulvenes, and Azulenes”, and “Annulenes and Related Compounds” are quite useful for synthetic chemists. While the tone of some of the chapters on “Electrophilic Reactions” and “Aromatic Rearrangements” are largely mechanistic discussions, the extensive references and attention to details concerning product yields should make these reviews of great value to synthetic chemists utilizing electrophilic reactions and aromatic rearrangements. The chapter on “Organic Dyes and Optical Agents” and “Aromatic Polymers” (included for the first time in this volume) contain useful recent developments for industrial chemists.

In sum, contributions in this volume represent scholarly works of great interest to synthetic, industrial, theoretical, and physical organic chemists, and each author realistically achieves his stated goals with a relatively simple approach. The only shortcoming of this volume is the lack of an author index although a subject index is included. This volume is a valuable reference book for organic chemistry teachers and students and also a welcome and valuable addition to any scientific library.

Norman M. Trieff, *University of Texas Medical Branch, Galveston*

**Determination of Food Carbohydrates.** By D. A. T. SOUTHGATE (University of Cambridge and Medical Research Council). Applied Science Publishers, London. 1976. ix + 178 pp. \$20.00.

Analysis of foods is becoming more and more important, particularly from a regulatory standpoint. Determination of carbohydrates poses special problems for several reasons, among which are the lack of a chromophore; the complexities of mixtures found in foods; the distinction between digestible (utilizable) and indigestible (nonutilizable) carbohydrates, a distinction of great importance to the nutritionist; and the fact that natural and modified polysaccharides, corn syrups, and sugars are added during preparation.

Some of the chemistry of carbohydrates is reviewed in an 18-page chapter. This chapter is followed by four short chapters on extraction and measurement of various classes of carbohydrates. Then comes a glance at the special analytical problems associated with the measurement of the carbohydrates in different classes of foodstuffs. The final chapter presents details of selected methods including both qualitative and quantitative methods; spectrophotometric and other physical methods; reducing sugar, other chemical, and enzymic methods; and paper, thin-layer, gas–liquid, and ion-exchange chromatography.

The author has a personal writing style, and the book is easy to read. The reader should have a good background in carbohydrates so that a brief review with the help of the references cited will suffice for an understanding of the reactions and physical properties involved.

One of the strong points of this small book is the theme of complete examination of the carbohydrates in a foodstuff, beginning with a qualitative examination and following through extraction and analytical procedures.

Gas–liquid chromatography has found wider application in the modern food laboratory than one might gather from reading this book. The same applies to thin-layer chromatography. No mention is made of high-pressure liquid chromatography or of the packaged preparations for the enzymic determination of glucose.

A separate category of mucilages is presented, although the author admits that the category is ill-defined. Actually, mucilaginous is a descriptive adjective denoting a distinctive physical property, but a category of mucilages has no chemical significance. References cited are not always to the most recent or most thorough discussion or presentation of a method or to its original developer.

All in all, this book, written for those involved in the analysis of foods, will fill a need and prove to be useful. It is a good practical guide to the methods currently used most widely for the determination of carbohydrates in foods.

James N. BeMiller, *Southern Illinois University at Carbondale*

**Phase Transitions and Critical Phenomena. Volume 5a.** Edited by C. DOMB (Kings College) and M. S. GREEN (Temple University). Academic Press, London. 1976. xvii + 420 pp. \$34.25.

This volume of the Domb and Green series contains articles by Kadanoff on scaling, universality and operator algebra, by Luban on generalized Landau theories, by Als-Nielsen on neutron scattering

and spacial correlation near the critical point, and by Kawasaki on mode coupling and critical dynamics.

The four chapters of this volume are quite diverse. Kadanoff's article is a presentation of his insightful contributions of 1966-1971. These ideas are constantly referred to in the field theory articles in Volume 6 and should be read in conjunction with that volume.

Luban's presentation of generalized Landau theories is quite lucid, but his discussion of correlations in the two-dimensional Ising model for  $T < T_c$  is erroneous.

Als-Nielsen's article is a fine introduction to neutron scattering. However, the data analysis he discusses in connection with the critical exponent  $\eta$  is now recognized to lead to erroneous values and has been abandoned in the most recent experimental studies.

Kawasaki's article is the major contribution to this volume (more than 50% of the pages). This is one of the most detailed discussions of mode coupling and critical dynamics in the literature and is a very convenient place to start if one intends to plunge into the wealth of literature on the subject.

Barry McCoy, *State University of New York—Stony Brook*

**Phase Transitions and Critical Phenomena. Volume 5b.** Edited by C. DOMB (Kings College) and M. S. GREEN (Temple University). Academic Press, London. 1976. xvii + 412 pp. \$34.22.

This volume of the Domb and Green series contains chapters by Binder on Monte Carlo investigations of phase transitions and critical points, by Hemmer and Lebowitz on systems with weak long-range potentials, by Stell on correlation functions and their generating functionals, by Tahir-Kheli on the Heisenberg ferromagnet in the Green's function approximation, and by Voronel on thermal measurements and critical phenomena in liquids.

The chapter by Hemmer and Lebowitz on van der Waals-Maxwell theory and Kac potentials is a great pleasure to read. The theory of weak long-range potentials is explained both clearly and rigorously (something only rarely accomplished) and should be read by everyone interested in condensation. It completely summarizes the field and is totally self-contained.

The short article by Voronel is also very easy to read and is a clear presentation of the measurements of singularities in specific heats by means of calorimetry.

Binder's article on Monte Carlo calculations is somewhat specialized. This technique is applicable to systems far away from the critical point, but Binder restricts his attention only to the aspect of the studies that is relevant to critical phenomena. He makes a restriction to Ising and Heisenberg systems and omits all work on continuous systems. However, since these spin systems have been intensively studied by other more analytical methods, the Monte Carlo calculations have not had a big impact.

Stell's article is of much broader interest than the title of the book implies because he deals with various expansions for correlation functions in a continuum fluid and does not restrict the discussion to the critical point. The Percus-Yevick and Kirkwood superposition approximations are discussed and the connection with the long-range weak potential problem is discussed in detail.

Finally, in the article by Tahir-Kheli various decoupling approximations to Green's function for the Heisenberg model such as the random phase and the Callen decoupling are presented.

Barry McCoy, *State University of New York—Stony Brook*

**Phase Transitions and Critical Phenomena. Volume 6.** Edited by C. DOMB (Kings College) and M. S. GREEN (Temple University). Academic Press, London. 1976. xviii + 575 pp. \$46.75.

This volume of the Domb and Green series is probably the most ambitious attempt that has been made to explain the use of renormalization group and field theory methods in the theory of critical phenomena. The authors of the various chapters, Wilson, Wegner, Brezin, Le Guillon, Zinn-Justin, Ma, Wallace, Aharony, Niemeyer, van Leeuwen, Di Castro, and Jona-Lasino, constitute many of the major contributors to the subject, and it is certain that this volume will become a classic reference in the field.

One particularly nice feature is that the relation of field theory to critical phenomena is discussed completely independently from the expansion in the parameter  $\epsilon = 4 - \text{spacial dimension}$ . Of particular benefit to those with no background in renormalized quantum field theory are the several simple and important examples which are worked out in considerable detail.

There is, however, a warning that must be made which is more

applicable to this volume than to the other volumes of the series. This is a rapidly developing field and already several calculations have been done in three (and two) dimensions which point the way to the eventual obsolescence of the  $\epsilon$  expansion.

There are also some pedagogic problems with this volume. Because of the many authors, there is an unavoidable amount of duplication. Furthermore, while the results are always very explicit, the foundations of the theory are not always made clear and many readers may well be left with many questions to resolve.

Nevertheless, it can be confidently asserted that this will be a most consulted reference for some time to come.

Barry McCoy, *State University of New York—Stony Brook*

**Advances in Radiation Chemistry.** Edited by M. BURTON and J. L. MAGEE (University of Notre Dame). Wiley-Interscience, New York, N. Y. 1974. 410 pp. \$31.50.

The present text is the fourth volume of a series of review articles on various aspects of radiation research. Three sections in this volume, by A. Hummel, K. Funabashi, and L. Kevan deal with ions, in particular electrons in irradiated solids or liquids. The description of the ionic events starts subsequent to the initial radiation loss and prior to the complex ionic reactions and physical processes of the ions formed. Hummel shows painstakingly in liquids the interplay of neutralization of the radiation formed ion-pair and possible reactions of these ions with added solutes. Sophisticated calculations are presented which faithfully describe the time sequence of the ionic reactions and diffusion processes. The author neatly weaves experiments and theory and a reading of this chapter will be useful to all interested in ionic reactions. Kevan discusses the current state of knowledge of electrons trapped in glasses at low temperature. In particular, the nature of the trapped electron is sought via absorption spectroscopy and magnetic resonance techniques. Theoretical considerations of the trapped electron are presented and correlated with the spectroscopic data. Funabashi presents mainly theoretical considerations of electrons trapped in solids. The final chapter on the radiolysis of polyethylene by Dole is an elegant portrayal of the state of knowledge in the radiolysis of solid polymers. It covers many areas of work from early days and is more heavily in the experimental sector than the other chapters. This again is of general interest and especially to polymer chemists who wish for a concise account of high-energy radiation effect on solid polymers.

The four chapters add up to an instructive text for both specialists in radiation chemistry, and also for free radical and photochemists, and "what have we" whose interests overlap this field. We have to thank again the Editors, Burton and Magee, for a constructive volume which not only informs but also urges us to seek the original texts reviewed here.

J. K. Thomas, *University of Notre Dame*

**Three-Dimensional Nets and Polyhedra.** By A. F. WELLS (University of Connecticut). John Wiley & Sons, Inc., New York, N. Y. 1977. xii + 268 pp. \$29.95.

Topological descriptions and characterizations of crystal structures are finding more and more interest, and this book by a leading expert is a timely addition to the scant literature in the field. The book reflects for the most part the author's own research on the topology of three-dimensional nets and polyhedra. Some emphasis is placed on "uniform" nets, i.e., nets in which all shortest circuits starting from any point are polygons having the same number of edges while the connectivity of the various points may differ. Although the characterization of the various nets is essentially based on topological criteria, some metrical limitations are introduced; nets in which unconnected points approach each other more closely than connected points are not considered "permissible". This and the strongly model-oriented approach set forth the viewpoint of the structural chemist rather than a mathematician's. An impressive collection of data is presented including the maximum space group symmetry of various nets. The usefulness of symmetry concepts in the study of nets has not been fully demonstrated, however. The study of this book is very stimulating and those who go through it carefully enough will find references to many interesting problems which are still to be solved. The book is not meant for class room use but will find its place in many bookshelves as an excellent supplement to Well's classic "Structural Inorganic Chemistry".

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