

Coupled with earlier evidence^{1,2} on the relative configuration, the above results establish conclusively the absolute configuration of rosenonolactone (I) at positions 1, 11, 12, 13 and 14, iso-rosonolactone being the 14 β -isomer.¹ Our stereochemical conclusions also apply to a new metabolite (m.p. 115–116°, $[\alpha]_D^{25} +57^\circ$ (Chl)) of *T. roseum*—9-deoxorosenonolactone—since its dihydro derivative proved to be identical with the desulfurization product of rosenonolactone 9-ethylene mercaptal. Finally, rosololactone⁹ must possess the identical

(9) A. Harris, A. Robertson and W. B. Whalley, *J. Chem. Soc.*, 1807 (1958).

absolute configuration at C-1, C-12 and C-13 as rosenonolactone (I).

We are indebted to Prof. H. H. Inhoffen for specimens of (–)- and (+)-*trans*-2-methyl-2-carboxy-6-ketocyclohexylpropionic acid.

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BOOK REVIEWS

Basic Physics of Atoms and Molecules. By U. FANO and L. FANO, Physicists, National Bureau of Standards. John Wiley and Sons, Inc., 440 Fourth Avenue, New York 16, N. Y. 1959. xv + 414 pp. 15.5 × 23.5 cm. Price, \$10.00.

This book is concerned with the principles of atomic and molecular structure, and is featured as "quantum physics presented through analysis of experiments, requiring a minimum knowledge of physics and mathematics." The authors begin with a relatively elementary discussion of initial evidence for the existence of atoms, followed by a description of the methods of detection of atomic events, the Rutherford alpha scattering experiment, evidence for energy levels of atoms and radiation, leading to the essential features of atomic structure.

The next few chapters develop an approach to quantum theory and quantum mechanics through a survey of the properties of electromagnetic radiation and analysis of the behavior of radiation and particle beams. To illustrate basic concepts considerable use is made of the Stern-Gerlach experiment and the polarization of light. A discussion of the size of atoms and the uncertainty principle is followed by formulation of Schrödinger's equation. The stationary states of the hydrogen atom are developed and the properties associated with these states described. Effects of current circulation within the atom and evidence for electron spin are considered. Part 1 (basic concepts, total of 264 pp.) concludes with chapters on magnetic interactions and the Pauli exclusion principle.

Part 2, entitled "Aggregates of Particles" (70 pp.), begins with a discussion of atoms with many electrons, the independent electron approximation, shell structure and the periodic system. The nature of the chemical bond in simple molecules is discussed in some detail, including reference to both the atomic orbital and molecular orbital approximations. The shape of polyatomic molecules, multiple bonds, non-localized bonds, conjugate systems and metallic systems are considered briefly and qualitatively. This section concludes with an outline of the features of macroscopic aggregates.

A series of appendices (total 64 pp.) is included at the end of the book to provide a more detailed mathematical treatment of the interaction of particles, Fourier analysis, statistical methods, complex numbers, matrices and resonance theory. A small number of exercises are provided at the end of each chapter of Part 1 (ca. 48 for the entire book). Answers are provided. References to original research papers are not included.

The authors state that their book is directed primarily to research workers in the natural sciences and presupposes only a general knowledge of physics and mathematics.

They intend only to give a qualitative picture of the properties of atoms and molecules rather than to teach how to calculate the solutions of quantum mechanical problems. The book is clearly written, follows a logical sequence of developments, and makes a valuable contribution toward the goal set by the authors. Those concerned with an introductory course dealing with the topics covered will certainly want to examine it carefully.

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Gas-Chromatographie. By A. I. M. KEULEMANS, Koninklijke/Shell-Laboratorium, Amsterdam. Englische Originalausgabe unter Mitarbeit von C. G. VERVER. Deutsche Ausgabe, mitbearbeitet und übersetzt von E. CREMER, Vorstand des Physikalisch-Chemischen Institutes an der Universität Innsbruck. Verlag Chemie, G.m.b.H., Weinheim/Bergstr., Germany. 1959. xvi + 208 pp. 17 × 24.5 cm. Price, DM 24.—

The outstanding book "Gas Chromatography" by Dr. Keulemans, originally published in 1957, has now been revised and printed in a German edition. The structure and content of the original volume have been left intact. The first three chapters deal with the general aspects of chromatography, analytical applications of gas-liquid chromatography and the apparatus used in practice. The next three chapters discuss the theory of chromatographic separations with studies involving the mobile phase, stationary phase and the solid support. Special applications of gas-liquid and gas-solid chromatography are presented in the last two chapters.

Frau Prof. Erika Cremer in her translation and editing has improved on the original work by incorporating a subject index. Fifty-one additional references have been added which include papers presented at the Symposium on Gas Chromatography at Amsterdam in May, 1958. The chapter on gas-solid chromatography has been enlarged with notes on the separation of inert gases, resolution of isotopes, determination of free energies of adsorption and catalyst studies. The subject of adsorption chromatography has been added in the appendix replacing the original appendix on katharometers.

In an expanding field such as gas chromatography, this edition should continue to be of considerable value to those interested in the subject.

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