Book Reviews

Electrical engineering: essential theory and typical applications. Fred H. Pumphrey. New York: Prentice-Hall, 1946. Pp. xiv + 369. (Illustrated.) $5.35.

This is a textbook in electrical engineering for students specializing in other fields. The wide range of topics treated in the volume makes it impossible for all of them to be covered in sufficient detail for the beginner, and the reader will find that many phenomena are not adequately explained. However, the bibliography at the end of each chapter is well selected and will help to solve this difficulty.

The limited material included in the chapters on direct-current machinery and circuits and alternating-current machinery and circuits is well chosen.

The relatively large space given to electron tubes and circuits is amply justified by the great importance of the electron tube as a control device in all branches of electrical engineering. The three short chapters, covering a total of 45 pages, give one of the most satisfactory introductions to the theory of electron tubes and circuits which it has been this reviewer's privilege to see.

The applications of electric energy for heating and welding and in a number of electrochemical processes are covered in a very interesting and informative manner.

In the chapter on electric motor applications the various types of loads are discussed, and the characteristics of the available motors are compared to enable the engineer to make the most satisfactory selection.

Throughout the book the drawings are particularly well made and leave no uncertainty in the mind of the reader. The photographs of details of apparatus are uniformly clear and easily understood.

This is a valuable book for the electrical engineer as well as for engineers in other branches who must make use of electricity as motive power or for control of manufacturing processes.

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Atomic and free radical reactions: the kinetics of gas-phase reactions involving atoms and organic radicals. E. W. R. Steacie. New York: Reinhold, 1946. Pp. vii + 548. $8.00.

"Information concerning elementary reactions is widely spread through the literature of chemical kinetics, photochemistry, pyrolysis, etc., and it is usually very difficult to assemble the existing data on any given reaction. This book is an attempt to bring together such data, and to treat the reactions of atoms and radicals in their own right, rather than as an incidental part of the mechanism of more complex changes." The discussion is confined to elementary reactions involving organic substances.

The book is divided into two parts. After a brief introductory chapter dealing with the elementary theory of reaction rates there are four chapters of a general character. Chapter 2 deals very fully with experimental methods (about 60 pp.). This is followed by three chapters dealing, respectively, with thermal decomposition reactions, polymerization reactions, and photochemical reactions. The material in these chapters is classified, to a large extent, according to the compound being studied. The author has given a very full account of the various proposed reaction mechanisms and has freely given his own judgment as to the extent to which the evidence should be considered conclusive in each case. This critical approach on the part of the author will make the book particularly useful to those who are not expert in this field.

The last half of the book (Chaps. 6–14) classifies reactions according to the elements, starting with carbon and hydrogen compounds, and following with chapters on compounds containing oxygen, nitrogen, chlorine, bromine, iodine, sodium, other metals, and sulfur, respectively.

Two notable features of this book are the extensive bibliography and a reaction index which includes activation energies. The latter will make this volume extremely useful in looking up all the free radical mechanisms involving a given free radical.

In the opinion of this reviewer the author is more successful in "bringing together" reactions of a given atom or radical than he is in "treating them in their own right." While it is true that Chapter 3 begins with an excellent discussion of the strength of bonds in organic molecules, little use is made of this when specific reactions are being considered.

Both the presentation of the material by the author and the format are excellent.

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Photography by infrared: its principles and applications. (2nd ed.) Walter Clark. New York: John Wiley; London: Chapman & Hall, 1946. Pp. xvii + 472. (Illustrated.) $6.00.

The pages of this book, written by Dr. Walter Clark, of the Eastman Kodak Research Laboratories, are filled with information on the general principles of photography, photography by the infrared, infrared radiation sources, value of infrared photography for various kinds of investigations, and some of the general characteristics of infrared radiation and its interaction with various materials.

The first chapter gives a general outline of the book, which is followed in the remaining 15 chapters.

In the second chapter the difference between infrared and ordinary photography is discussed. It is pointed out, with many examples, that many substances that are opaque to light are transparent to infrared radiation. Some of the necessary precautions for taking and developing pictures are then outlined, the extra care entailed by the use of infrared radiation being pointed out. There is a very complete discussion of the extension of the sensitivity of the photographic plate to longer and longer wave lengths, giving the various steps by which this has been accomplished. Plates sensitive out to 12,000 A. are now on the market. The present wave-