

## REVIEWS

**SI Units in Engineering and Science.** By K. D. Chandrasekaran and D. Venkateswarlu (Chemical Engineering Education, Development Centre, Indian Institute of Technology, Madras 600 036), September 1979. Pp. 183. Price : Rs. 50.00 including postage.

The International system of units, designated as SI Units is based on six base units, viz., Metre (length), Kilogram (mass), Second (time), Ampere (Electric current), Kelvin (Temperatures), Candela (luminous intensity). Subsequently the mole (amount of substance) has also been included as a base unit. 'SI Units' is believed to represent a single and consistent system of units which is universal covering all physically measurable quantities in terms of these base units and their derivatives. The Eleventh General Conference of the International Committee on Weights and Measures, in 1960 adopted the SI Units as a system of measure for international relations. The standards of weights and measures act, 1976 of India adopted SI Units in all fields of engineering, science and technology, including education and training of engineers and technologists.

The compilation 'SI Units in Engineering and Science' by K. D. Chandrasekaran and D. Venkateswarlu is therefore a very welcome effort, which should definitely help all those, involved with measurements adopt to the new system of units. After introducing the new System of units (basic and derived) the authors have given an exhaustive treatment of the preferred units, recommended multiples and conversion factors. A distinct feature of the book is that a number of problems have been solved illustrating the SI Units, conversion of units from one system to the other and so on. The book is very well recommended for students, teachers, practicing scientists and engineers and all those involved with measurements.

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**Principles of Protein Structure.** By G. E. Schulz and R. H. Schirmer. (Springer-Verlag, New York), 1979. Pp. 314. Price DM 54.00.

This is the first book to appear in the series entitled "Springer Advanced Texts in Chemistry", Edited by Charles R. Cantor. As stated by the Editor, "our goal, in this series, is to pinpoint areas of chemistry where recent progress has outpaced what is covered in any available textbook", and according to the authors, "The aim of this book is to consider principles

which have emerged from comparison of known protein structures". The reviewer feels that both these objectives have been amply fulfilled in this book.

After considering the chemistry of the 20 standard amino acids and the nature of the peptide bond, with special reference to the *cis* and *trans* configurations of the peptide unit, the various types of intermolecular forces that stabilize the folding of polypeptide chains are discussed. Statistical criteria for the prediction of secondary structure are then discussed briefly, followed by an account of theoretical ideas, such as statistical, mechanical and thermodynamic considerations, that determine both the nature and the kinetics of polypeptide folding.

Although the structure of no particular protein is discussed in detail, general considerations of homology between proteins of related biochemical function, of protein evolution, common features in types of binding sites like those of immuno-globulins, serine proteases, and those that occur in interactions with other biological macromolecules, are all discussed in a clear and analytic manner.

The discussion of the structural basis of the biological activity of proteins is unfortunately rather brief in the last chapter of the book, although a few typical examples are discussed in good detail. On the whole, the book definitely contains much material that will normally be found only in review articles, and the volume clearly merits to be called an Advanced Text. Molecular biophysicists and x-ray crystallographers will find much therein that will enlarge their field of view. Biochemists, however, may find themselves a little out of their depths. However, even for them, an overall survey of the book, without going into details, will provide much food for thought.

I warmly recommend this book to every library in biochemistry, biophysics and molecular biology.

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**Surprises in Theoretical Physics—Princeton Series in Physics.** By Rudolf Peierls. (Princeton University Press, Princeton, New Jersey 08540 U.S.A.), 1979. Pp. viii + 166. Price : Clothbound \$ 19.00, Paperbound \$ 5.00.

*Surprises in Theoretical Physics* by Rudolf Peierls is a welcome and unique addition to the literature of its subject. It is a concise (166 pages)

account of many subtle questions from all branches of theoretical physics presented in the gentle, personal style of a teacher. Nothing could be more different at first sight from the impersonal, comprehensive style of the nine volume Landau-Lifshitz series! Yet the mutual influence and respect of these two authors is revealed by the number of references each makes to the other—and the insight which shines through the present book invites the comparison.

Some of the most illuminating sections of the book concern topics which most of us would classify as well understood—the Boltzmann equation for transport, momentum and pseudo-momentum in condensed matter, etc. The author starts with probing questions which show that our complacency is not justified, and then puts us well on the way to a better understanding in the space of just a few pages. Other examples deal with more specialised material, such as the failure of the attempt to expand quantities like diffusion in a gas in powers of the density. But the agreeable and stimulating sense of surprise is never lost. Mathematical and technical fireworks are totally absent and the appeal of the book is really to anyone not entirely allergic to theory.

The sections on quantum mechanics, both its principles and applications to atoms and nuclei, deserve special mention. Also included are clear, brief treatments of two vexed questions—thermodynamic irreversibility and quantum measurement—which will help dispel the fog which has traditionally surrounded them.

To conclude, we have much more here than “a little book” whose object is to “illustrate and entertain”—to quote from the preface. Much of the spirit (and a tastefully selected part of the content) of theoretical physics has been captured in its pages. One hopes for an expanded second edition which will give us more surprises and in particular follow up the tantalising remark that “the actual momentum of light in a refractive medium is a very complicated quantity”.

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**Natural Zeolites: Occurrence, Properties, Use.** Edited by L. B. Sand and F. A. Mumpton. (Pergamon Press Ltd., Headington Hill Hall, Oxford OX3 0BW, England), 1978. Pp. xi + 546. Price: US \$ 75.00, £ 42.00.

This book consists of papers selected from those presented at the Zeolite 1976 conference on the occur-

rence, properties and utilization of Natural Zeolites; the conference was held at Tuscon, Arizona. This is the first ever conference proceedings on Natural Zeolites. This volume covers all recent advances covered with extensive reviews of the geological occurrence, adsorption and ion-exchange properties of the natural Zeolites. The book has unique introduction to the subject for beginners. The chapters on the utilisation of natural zeolites is invaluable to engineers and Industrial Scientists. It is no doubt a very useful and basic reference book of the field of natural zeolite for mineralogists, geologists and chemists in the fields.

This unique volume contains 45 papers and over 1,500 references.

*Contents :*

1. Introduction: Natural Zeolites: a new industrial mineral commodity, F. A. Mumpton.
2. Crystal Structure and Mineralogy: eight papers are included. Mineralogy, Crystal Chemistry, Morphology by Scanning Electron Microscopy are some of the topics in this section.
3. Geology and Occurrences: Seventeen papers are included which give *vivid* descriptions of the occurrences of zeolites in specified environments. Origin, mode of formation and geochemistry are dealt with. Hydrothermal synthesis and alteration studies are included.
4. Physical and Chemical Properties: There are eight highly interesting papers including studies on sorption, diffusion, cation-exchange equilibria, adsorption and catalytic properties, thermal stability and ion-exchanged forms. They are extremely interesting and useful.
5. Applications: Eleven papers are presented. Utilization of natural zeolites in Japan; Zeolite ion exchange in radio active and corporation waste water treatment; solar energy applications of natural zeolites; production of oxygen and nitrogen with natural zeolites are some of the topics in this section.

For geologists, mineralogists, chemists, industrial scientists and engineers involved in zeolite molecular sieves this volumes is a must as the latest reference. I strongly recommend this volume to all university libraries and especially to research teaching staff of chemistry and geology departments in all Indian Universities.

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