the treatment. This is inevitable—it is more difficult to give an adequate treatment of a technique such as nuclear magnetic resonance spectroscopy in a limited space than it is, say, paper chromatography. When complex instrumentation is required the operation of a particular instrument is described. Users of other makes of instruments will find such sections of limited value. In certain cases the authors have made some allowance for this problem, for example, by describing the operation of three ultraviolet spectrophotometers.

The book is well printed on good quality paper and is bound in strong paper covers.

Its usefulness as a laboratory manual will depend to a large extent on the types of experiments planned and the instrumentation available. The book should prove of greatest value to research workers, since it contains much useful information in a convenient form and it indicates where to go for more.

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Unsaturated Polyesters. Structure and Properties. By HERMAN V. BOENIG. American Elsevier Publishing Co., Inc., 52 Vanderbilt Ave., New York 17, N. Y. 1964. x + 222 pp. 16 × 23 cm. $10.00.

This is the finest book written up to this time on unsaturated polyester resins. The book reflects this dynamic nature of the author and his interest in this field.

The format of the book is different enough from most technical books to make it pleasing to look at, as well as easy to read. The table of contents covers the subject well and, with the aid of the index, specific information is readily extractable. The book contains 241 references from the current literature, patents, and industrial brochures. Science, rather than technology, is stressed.

The chapter on cross linking is brief, but is sufficient to show the nature of the copolymerization reaction between the polyester and the monomer solvent. However, a much better example of this comonomer–copolymer relationship upon polymerization would have resulted if the example Figure 1 were directly related to the relative reactivity ratios given in Table 2.

The chapter on structure shows the extent that the heat distortion temperature is dependent on sufficient monomer for cross linking, the unsaturated–saturated acid ratio, and the structure of the glycol.

Nothing appears in the book to show the effect of varying the excess glycol in a polyester with respect to the properties of the liquid and the cured resins. The book also states practically nothing on cooking of polyester resins and the effects of the many variables and the resulting by-products, though small in amount.

The chapter on polyester compounding is very good since it gives an insight into the more subtle problems relating to the curing of unsaturated polyesters to achieve specific results.

In conclusion, this book is an excellent blend of the authors experience and the literature, and should be included in every technical library.

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International Series of Monographs on Pure and Applied Mathematics. Volume 53. Mathematical Foundations of Thermodynamics. By R. GILES, Department of Natural Philosophy, University of Glasgow. The Macmillan Co., 60 Fifth Ave., New York 11, N. Y. 1964. xiii + 237 pp. 14.5 × 22.5 cm. $10.00.

It is well to state in the beginning that the title of the volume under review does *not* refer to the mathematical techniques used in the customary formulations of thermodynamics. The properties of partial derivatives, jacobians, pfaffian forms, and so forth, are irrelevant for the author's purpose, which is to present thermodynamics as an "ideal" physical theory. Such a theory is, according to the author, a set of primitive concepts, together with axioms giving the properties of these concepts. The primitive concepts appear as mathematical objects *without any physical connotations* (italics in the original). A set of rules of interpretation is also given which enable one to assign meaning in terms of physical experience to the primitive concepts of the mathematical theory. It is, of course, legitimate to use the physical interpretation to *suggest* useful definitions, and to *conjecture* possible theorems, but the statements of the definitions and proofs of the theorems must be independent of the rules of interpretation. These are the ground rules which the author has set up. The point of view is similar to that of abstract algebra, where the familiar systems of real and complex numbers appear as special realizations of abstract algebraic structures.

The domain of the theory is classical and relativistic equilibrium thermodynamics. The main text of the book is written with the physical meaning well to the fore, and so does not follow the austere definition–theorem–proof sequence one would expect from the ground rules. The formal development of the theory, together with proofs of some of the more difficult theorems, are relegated to a 24-page appendix. It is therefore possible to read the book profitably without great mathematical knowledge if one is possessed of considerable mathematical sophistication. However, to understand the book thoroughly, one needs to know considerably more about such things as functional analysis on topological groups than does the reviewer.

The main distinction in substance between the author's theory and the usual theories of thermodynamics is that the author is forced, for the sake of rigor, to treat only isolated systems. The very useful distinction between systems and surroundings in the usual theory is, apparently, not permissible here; the surroundings must be considered as part of the system. Although this does not detract from the beauty of the theory, it would certainly lead to considerable awkwardness were one to attempt to apply the theory, as developed, to a detailed thermodynamic calculation for a practical case.

Insofar as I can judge, the author has completed his task successfully. However, the nature of the task is such that this book will be of no interest to those who merely want to increase their aptitude in thermodynamics as a working tool for the solution of problems. However, those who already know some thermodynamics and some abstract mathematics, and who wish to stretch their mental horizons through a beautiful exercise in applied mathematics (in the most sophisticated sense), will enjoy the book.

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