tions are chosen to illustrate the principles and methods involved in the various types of chain processes. The most interesting section of the book deals with the mathematical treatment of chain reactions including nonsteady state conditions. The rigorous mathematical representation may at first appear to be an exercise in the solution of complex differential equations. However the labor is well justified in the application of the theoretical results to an analysis of the characteristics of spontaneously explosive reactions, such as the hydrogen-oxygen reaction and the oxidation of carbon monoxide. The final chapter is devoted to the kinetics of an unbranched chain reaction as encountered in addition polymerization of unsaturated compounds.

In general this book serves the very fine purpose of examining the theoretical principles of the kinetics of chain reactions, including the interplay of mass transport and chemical interaction. The treatment is not directed at the specialist engaged in research in chemical kinetics, rather it is a brief account of a rapidly expanding field of scientific endeavor. The keen interest in combustion processes and polymerization reactions coupled with the availability of modern computing devices promises major advances in chemical kinetics during the next twenty years.

An Introduction to Junction Transistor Theory. By R. D. Middlebrook. 296 pp. John Wiley & Sons, Inc., New York, 1957. $8.50. *Reviewed by R. Hobart Ellis, Jr., New York City.*

As engineers take over radar's microwaves and the nuclear chain reaction, the physicist's frontier seems to be shifting to the study of solids. The ten-year-old transistor is the most useful contribution to come from this study. It is still so young that to most physicists it is just a tiny substitute for a vacuum tube. This book will serve as a simple path to a more subtle understanding.

For convenience we can divide transistor study into semiconductor physics, electrical action of transistors, and transistor circuitry. Dr. Middlebrook aims at the second. He offers some semiconductor theory as a foundation, discusses electrical function thoroughly, and leaves circuitry to others. In terms of minority carrier density and migration he describes transistor action for us and develops in detail the equivalent circuit on which he has worked at Stanford University.

The nonpragmatic scientist, curious about the nature of things for the fun in it, may be a little unhappy at the physics in the book. The relationships among electron orbitals, holes, and conduction electrons are not clearly delineated. One hard-to-take model pictures hole migration in terms of a cluster of negative mass electrons that moves as a unit in a direction opposite to the force of the electric field and carries the hole along in the center. But the author frequently refers his reader to Shockley's basic *Electrons and Holes in Semiconductors*, in which such matters are treated exactly. He assumes the Fermi-Dirac population formula without derivation and discusses Brillouin zone conduction in only a cursory manner.

We must compliment author and editor on the planning of the book. It has been wisely said that the way to teach a subject is to describe it completely in a page, then do it over again in a complete chapter, then at book length, and so on. This book follows this plan. Quantitative descriptions follow qualitative ones, and the reader is kept constantly aware of what is ahead of him.

In a few years the term "circuit design" will not imply only vacuum-tube circuits as it does in current book titles. People will learn to use the transistor for its unique properties as a current amplifier, and this book will help them learn.

Statistische Thermodynamik. By Arnold Münster. 852 pp. Springer-Verlag, Berlin. Germany, 1956. DM 138.00. *Reviewed by T. Teichmann, Lockheed Aircraft Corporation.*

While statistical and mechanical thermodynamics remain among the most basic and unifying aspects of modern science, the development of new techniques and their application to new problems lead to an inevitable change of emphasis and approach. Professor Münster has recognized this in his work which essays to satisfy the needs of the practicing physicist and physical chemist while yet retaining some of the aspects of a textbook and providing the student with a thorough foundation. Naturally such an ambitious approach has necessitated certain restrictions in topics and methods—for example, only equilibrium states of matter are considered and while the basic methods are thoroughly described, many possible variants are omitted—but the book remains the most comprehensive and palatable account presently available. In order to make this great mass of material more accessible to beginners, the more advanced topics for application are "starred" and can be omitted at the first reading.

The book consists of four sections dealing with the foundations of statistical mechanics, the theory of gases, the theory of crystals, and the theory of liquids. It is, of course, impossible in a review of this length to list all the significant subjects described but certain features of the treatment seem of particular interest. There are included a very thorough treatment of Gibbs' method and a discussion of the ergodic problem, and an extended discussion of phase transition including the new methods of Lee and Yang, a description of the general theory of condensation, and discussion of the Born-Green theory of molecular distribution function. In the section on crystals, a detailed description of the Kramers-Wannier theory is given and Onsager's solution of the two-dimensional Ising problem is presented in the form first given by Montroll and Newell. The implication of this method for three-dimensional problems is touched on, though not as thoroughly. The electron conductivity of metals and the Nernst heat theorem are also given thorough consideration in this section. The