

Recent Books

● COLLEGE CHEMISTRY

Linus Pauling, Professor of Chemistry in the California Institute of Technology. W. H. Freeman and Company, San Francisco, 1950. x + 705 pp. 213 figs. 37 tables. 16 × 24 cm. \$4.50.

Those who have used Pauling's "General Chemistry" will welcome this new book because it fulfills very well the purpose of the author to furnish a first-year chemistry text "written in a more slowly paced, less mathematical form." Although the entire book has been reset in a more easily read type, and new and improved illustrations have been added, much of the older book remains.

The most radical change has been the treatment of gases and the gas laws. These subjects are considered much earlier than in "General Chemistry," and much discussion is devoted to the physical behavior of gases before the gas laws are presented in detail. The perfect gas equation is deferred until after a thorough treatment of Boyle's and Charles' laws. Discussion of van der Waals' equation has been deleted.

Other outstanding changes include a chapter devoted to the chemistry of the common elements, introduction to biochemistry and more detailed treatment of photography, including color photography. Chromium and manganese are considered with the other transitional metals in a chapter much nearer the end of the book. The principle of Le Chatelier has been shifted to the chapter on water and is illustrated by reactions involving water softening by a zeolite. The equilibrium between nitrogen dioxide and dinitrogen tetroxide is also used to discuss this important principle in a combined chapter on chemical equilibrium and the rate of chemical reaction; it is further discussed and illustrated by heat of solution.

The discussion of molar, normal, and molal solutions has receded to the conventional, and it is with a twinge of lament that one reads the footnote on page 340: "A few authors have used molality as the moles per liter of solution, but this usage has not been accepted." The term "formality," has been retained to express the number of gram formula weights per liter of solution. More confusion is likely to result from the use of "molar freezing point constant" ("weight-molar, moles per 1000 g. of solvent"), on page 349, than the use of molal freezing point constant in the earlier book, even though, for Pauling, molal had a different meaning. Pauling addicts will find that cyanuric triazide is notably absent.

A discrepancy carried over from the earlier book appears in discussions of the diameter and radius, respectively, of the electron. The *diameter* (page 35) is given as 10^{-12} cm., while the *radius* is correctly stated (page 71) to be "about 1×10^{-12} cm." Again on page 575 gasoline is stated to be a "heptane-to-nonane mixture" while on page 579 appears "...normal hexane (gasoline)...." Another misprint, is this statement (page 50): "The randomness of structure usually causes the density of a liquid to be somewhat less than that of the corresponding crystal; that is, the volume occupied by the liquid is usually somewhat less

than that occupied by the crystal." Misprints, are however, infrequent and most of the rare misprints in the earlier book have been corrected in this one.

This is one of the first elementary texts to list and discuss elements 97 and 98, and to incorporate the decisions of the September, 1949, meeting of the International Union of Pure and Applied Chemistry. The hydrogen bomb is discussed in a subchapter relating nuclear fission and nuclear fusion. The name of Celsius has been mentioned with the Centigrade thermometer scale, but the latter term is not discarded.

A conscientious effort has been made to clarify many of the more difficult passages which puzzled students in the first text, but curiously enough this gem of clarity has been retained (page 347): "At constant temperature, the partial pressure in the gas phase of one component of a solution is, at equilibrium, proportional to the concentration of the component in the solution, in the region of low concentration." Fortunately, Pauling's own translation follows: "This is equivalent to saying that the solubility of a gas in a liquid is proportional to the partial pressure of the gas." (Henry's Law).

Pauling's new book will not be easy reading for many college freshmen. Nevertheless, many students of only average ability in chemistry will find the book extremely interesting, and instructors will find that, in many cases, the teaching from Pauling will not be more difficult than that from other, less exacting, texts. Dr. Pauling's new book should prove very successful in any course on the freshman level in which quality of concepts is important. In any case, a student using this book will receive an excellent introduction to the "science of substances," and be well prepared for advancement in later science courses.

The impact of the Pauling texts on college chemistry teaching will be felt for a long time. It is with much interest that we now look forward to the rewriting of the more advanced "General Chemistry."

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● MODERN GLASS WORKING AND LABORATORY TECHNIQUE

M. C. Nokes. Chemical Publishing Co., Inc., Brooklyn, New York, 1950. xiii + 157 pp. 96 figs. 13.5 × 20.5 cm. \$3.75.

This is a valuable little book, especially for teachers who find it necessary to do their own laboratory constructional jobs (and who doesn't?). Not only does it explain and illustrate the principal types of glass-working operations—for soft glass as well as borosilicate—but it also deals with such topics as sealing metals into glass, electric welding, vacuum tubes, photoelectric tubes, and vacuum technique.