

NEW BOOKS

Periodic Table. Reprinted and enlarged from General Chemistry by HORACE G. DEMING. 95 × 155 cm. John Wiley and Sons, Inc., 440 Fourth Avenue, New York. Price, \$3.50.

In general principle this chart is similar to one in Nernst's Theoretical Chemistry and still more closely related to the chart of Antropoff, reviewed in THIS JOURNAL 49, 888 (1927). While it does not have the colors of the Antropoff chart, the same relations are brought out by connecting lines. It contains a number of valuable features not found in the other chart, especially the successive shells of electrons for the inert gases and the radioactive disintegration relations. The chart will be very useful for recitation rooms and offices.

WILLIAM A. NOVES

Theorie der Adsorption von Gasen (Theory of Gas Adsorption). By EMANUEL JAQUET. Gebrüder Borntraeger, W 35 Schöneberger Ufer 12a, Berlin, 1925. 56 pp. 17 figs. 25.5 × 16.5 cm. Price, unbound, 4.80 M.

The theory of adsorption is developed by considering the adsorbed molecules as systems of electric charges (dipoles or quadrupoles) in thermal equilibrium in a variable electric field due to the contiguity of an adsorbing surface, regarded as a perfect conductor or dielectric. First, the form of the isotherm is investigated, and several methods are suggested for allowing for the intermolecular action which causes departures from Henry's law. The equation best fitting the experiments is one which is essentially the same as that given by Langmuir,¹ although the author does not mention this. Next, a method is derived for estimating the maximum adsorption energy from the observed temperature coefficient of the initial slopes of the isotherms, having regard to the fact that at high temperatures the adsorbed molecules do not occupy positions of minimum potential energy, so that the mean energy, as given by the temperature coefficient, must be multiplied by a factor. Expressions for the electrostatic energy of dipoles and quadrupoles in the vicinity of a conducting wall are derived, and found to involve the molecular diameter, the electrical moment or moment of inertia and, to a secondary degree, the polarization constant. In the case of dipoles, the energy should show a marked temperature variation owing to changes in molecular orientation.

The conclusions are tested by comparison with experiment, and tolerably verified, the values of the constants obtained being of the same order of magnitude as those derived by other means.

A. S. COOLIDGE

¹ Langmuir, THIS JOURNAL, 38, 2268 (1916), eq. (16).

A Text-Book of Organic Chemistry. By Dr. JULIUS SCHMIDT, Professor of Chemistry in the Technical High School, Stuttgart. English Edition by H. GORDON RULE, Ph.D., D.Sc., Lecturer in Organic Chemistry, University of Edinburgh. D. Van Nostrand Company, 8 Warren Street, New York City, 1926. xxiv + 798 pp. 24.5 × 17 cm. Price \$9.00.

The author intended to write "a book which stimulates the reader to think for himself." There is every reason to believe that he has been successful in this endeavor. This text is remarkably free from errors in spelling and in punctuation. On page 143, footnote numbers are omitted. This is all the more evident because of the notable freedom from such slips in the book as a whole. In general, the print work indicates that the book has been carefully made up and proof-read. It is characterized by an abundance of references to the original literature.

The material included in the first part of the volume is too elementary for the remainder of the work. It is, for example, useless to indicate the mode of calculating empirical formulas in a book which subsequently deals at some length with such a subject as osotriazoles. No endeavor is made to avoid the use of such terms as normal and iso before these are explained. It is, at least, debatable whether or not the book might not really benefit by the elimination of all material on analyses, and thus do away with the first sixteen pages. This specialized branch of organic chemistry might preferably be covered in a separate volume.

The statements in this book are concise and clear, and characterized by a feature almost unique, namely, the designation of the specific reagents utilized in various reactions, instead of the all too common and very unsatisfactory remarks to the effect that this or that change is produced by oxidation, reduction, etc., found in so many other books. It is pleasing to note the translator's conformity with the rules for numbering organic ring systems, recently published by a Committee of the International Union of Pure and Applied Chemistry.

In the discussion of the determination of molecular weights by the Victor Meyer method, references to air as a standard are superfluous and simply make the computations unnecessarily involved. Certain of the statements dealing with 1,4 addition are surprising, especially when consideration is given to the well-known work on conjugated systems in alpha, beta unsaturated ketones with the Grignard reagent. In the description of melting-point determinations, there is altogether too much detail, quite unnecessary if it is assumed that the reader is capable of appreciating most of the material in the book.

The slowness with which facts in the periodical literature get into texts is nowhere more evident than in the neglect to correct the hoary statement that $C_{60}H_{122}$ is the highest known member of the saturated hydrocarbon series; this despite Gascard's publication dealing with $C_{64}H_{130}$, which ap-

peared in 1921. The residents of Seminole County, Oklahoma, might be excused some righteous indignation if they took violent exception to the statement that Pennsylvania is the most important source of petroleum in North America.

Occasionally the rather loose use of the term "solution" instead of the more exact "colloidal suspension" may be noted. In the description of the purification of crude ether, the recommendation that quicklime be used to remove alcohol hardly seems reasonable. The designation of certain compounds as isonitriles might advantageously be changed to isocyanides. The more desirable pinacol and pinacolone for pinacone and pinacoline have not been utilized. In dealing with the formation of glycol chlorohydrin, the use of hypochlorous acid and ethylene is not mentioned. Sufficient years have elapsed since the World War so that this process, of no mean importance, might be expected to be found in a book of such scope as this. Almost invariably textbooks indicate that dynamite is made of kieselguhr, whereas generally, and certainly uniformly in the United States, wood pulp or wood powder is used.

In the section on monosaccharides, these compounds are classed according to the number of carbons in the molecule without reference to the modern tendency to use the number of oxygens instead. When this method is used, rhamnose and similar compounds are, quite as a matter of course, regarded as pentoses, which is in accordance with their chemical behavior. The formula for lactose is incorrect, but it is too much to expect anything else. The formula most recently suggested by Haworth, wherein both parts have amylenoxide rings and the biose attachment is on carbon 4 in the glucose part, is, however, more acceptable than that given. The formulas for the uric acid syntheses in one case indicate potassium cyanate, whereas cyanic acid would be in accord with what is subsequently given. In naming saturated alicyclic compounds, both the polymethylene and the more preferable cyclo systems are employed. In one instance, both designations appear in the same sentence. In the conversions of aromatic to aliphatic compounds, no mention is made of the very important industrial preparation of maleic anhydride by the catalytic oxidation of benzene. In the portion dealing with furane derivatives, instead of the more desirable furane, furfurane designations are employed. It would seem advantageous to indicate the possibility of the furfurane scheme, and thereafter to employ consistently the more modern furane naming.

In the section on proteins, it is stated that "most of it (nitrogen) is present in peptide groups." This is certainly debatable in the light of recent information concerning the possible occurrence of dioxopiperazines, pyrrole and even ureide complexes in this extraordinarily important group of substances. It is, of course, impossible to have any text absolutely up-to-date in all matters, and this is doubly true of a translation, but it

seems that an inkling of something other than the classical peptide structure for proteins might have been included. Certainly that "it may be stated with confidence that most of the constituent parts of proteins have now been identified" requires clarification, at least to the extent of the author's meaning of the term "constituent parts." It must be admitted that a dioxopiperazine derivative is mentioned as a protein degradation product, but not in such a manner that even by intimation can one conclude that dioxopiperazines may be present as such in the protein molecules.

The special sections on the various classes of ring compounds are unusually numerous and seem to have been especially well treated.

It has been stated that it is an American characteristic never to praise anything without immediately qualifying the approval. In this instance the procedure will be reversed. Despite the criticisms of this volume, it should be recognized as one of the most stimulating, lucid and useful of the larger organic chemistry texts, and an eminently worth while production.

G. ALBERT HILL

Textbook of Biological Chemistry. BY JAMES SUMNER, Ph.D., Assistant Professor of Biological Chemistry, Cornell University. The Macmillan Company, 60 Fifth Avenue, New York City, 1927. xxiii + 283 pp. 6 figs. 22.5 X 14.5 cm. Price \$3.50.

Five chapters on the subjects of fats, carbohydrates, proteins, urine and blood make up about two-thirds of this book. The chemistry of digestion is treated in short sections under the chapters on fats, carbohydrates and proteins. The chemistry of muscle, nerve and bone is almost entirely neglected as is also that of the mineral constituents of the tissues. The book is intended for elementary students and, presumably for that reason, no references are cited. The somewhat frequent use of workers' names is hardly in line with the same principle. Typographical errors occur on pages xxii and 91. The names Macleod and Schafer are misspelt on page 68.

GEORGE HUNTER