

So far as we have been able to gain access to the literature, we find no product which corresponds to this substance to have been noted. We, therefore, venture to claim that this oil carries an alcohol-ketone, in several respects allied to the phytosterols, in other regards differing markedly from such types, and have named this solid product, pending its further examination, "Prosol."

Summary.

The oil of proso millet is a semi-drying oil, capable of classification in this regard, with oils of sesame, rape and peanut.

It is essentially composed of glycerides of the following fatty acids: palmitic, oleic, linolic, iso-linolic, and, in smaller percentages, carnaubic and daturic.

The solid acids from such an oil can best be separated through their fractional precipitation from a series of varying concentrations of alcohol in water, with fairly constant differences between successive concentrations.

The bromination method seems inadequate for the satisfactory separation of individual members of the unsaturated fatty acids from similar oils.

A ketone alcohol, insoluble in water, soluble in certain organic solvents, and possessing certain properties similar to those of a phytosterol, is a by-product in the preparation of this oil, as the authors prepared it for analysis. So far as they have been able to ascertain, this product has not been discussed in the literature pertaining to plant products.

BROOKINGS, S. D.

NEW BOOKS.

Verdampfen, Kondensieren und Kühlen. By E. HAUSBRAND. 6th Edition. 1918. 53 figure, 5113 tables. 540 + xix pp. Julius Springer, Berlin. 16 Mk.

This edition contains much new material, formulas, tables, and examples, from investigations prior to 1918 which should be helpful in the design, construction and operation of apparatus for evaporating, condensing or cooling. It contains 37 more tables and 140 more pages than the second English edition of 1916. Much of the book has been rewritten with new material in almost every chapter. A number of tables have been changed to conform with later investigations. Noteworthy are the additions on heat transfer in liquid and vapor cocurrent and counter current systems; in heat interchangers, and preheaters; in evaporators using hot liquids; in still steam through cold tubes; and in systems using air, gases, and superheated water vapor. The section on multiple effect evaporators has been entirely recast to show more clearly the function of each unit in the multiple system. Most of the new data have been taken from German engineering publications.

L. B. OLMSTEAD.

Lehrbuch der Physikalischen Chemie. By DR. KARL JELLINEK. In 4 books: Book I only now published. Ferdinand Enke, Stuttgart.

The author has undertaken what promises to be by far the most comprehensive treatise of Physical Chemistry that has been attempted. The only one approaching it in scope is that by W. Ostwald "*Lehrbuch der allgemeinen Chemie*," the first part of the second edition of which appeared about 1891. The text-books of physical chemistry by W. Nernst, J. H. van't Hoff as well as those by English and American authors are necessarily brief in their treatment of this field and in some instances omit entirely certain important phases of the subject. It is true, as pointed out by the author, that in most of these books chemistry has been emphasized very much more than physics. In view of the remarkable advances which have been made in both physics and chemistry during the last two or three decades, the author has felt that there is a place for an extensive treatise on physical chemistry in which this vast amount of information is properly systematized and in which the two sciences, physics and chemistry, are properly correlated.

For purposes of presentation, the subject has been divided as follows: Book I, Vols. I and II, "*Die Lehre von den Aggregatzuständen (reine Stoffe und verdünnte Lösungen der Nichtelectrolyte)*;" Book II, Vol. III, "*Die Lehre von Aufbau der Materie (Weltäther, Electrone, Ionen, Atome und Molecule)*;" Book III, Vol. IV, "*Die Lehre von den Umwandlungen der Materie (chemische Statik und Kinetik)*;" Book IV, Vol. IV, "*Die Lehre von den Umwandlungen der Energie (Mechanochemie, Thermochemie, Magnetochemie, Electrochemie, Photochemie)*."

Book I, Vol. I (part 1), "*Die Lehre von den Aggregatzuständen*," xxxvi + 732 pp., 253 figures, 81 tables. 1914. Price, 27 Mk.

The author has considered 5 states of aggregation, the gaseous, the transitional (gas to liquid), the liquid, the fluid and the solid. The first 3 are fully treated in Vol. I. The first portion of this volume serves as a general introduction to the subject of physical chemistry, discussing atomic theory, perfect gas laws, molecular theory, law of conservation of energy, principle of the increase in entropy and Nernst's heat theorem. It contains an exceptionally complete and well systematized bibliography not only of the important books and journals of various branches of chemistry but of physics and, to a lesser extent, of mathematics as well. A detailed table of contents and an author and subject index are included in both volumes.

Book I, Vol. II, (part 2). "*Die Lehre von den Aggregatzuständen*." xii + 939 pp., 401 figures, 149 tables. 1915. Price, 35 Mk.

This volume contains a thorough treatment of the fluid and solid states of aggregation as well as of gaseous and liquid solutions. A discussion

of colloidal solutions is not included as was originally planned, but is to form the subject of a later volume. The electrical, magnetic and optical properties of pure substances have not been considered in Book I, but will be treated in Book II.

The subject matter of these two volumes is well arranged, clearly written and in general very complete. As an illustration of the character of the material presented, the subjects treated under kinetic theory may be mentioned. They are: Maxwell's law of distribution of velocities; rigorous derivation of the gas law from kinetic theory; concept of the degrees of freedom, rotation of gas molecules, vibration of atoms in gas molecules, principle of the equipartition of energy and the various degrees of freedom of a molecule in stable condition; theory of specific heat of gases from the standpoint of the classical kinetic theory and of the quantum theory. In addition to the theoretical treatment, the most important experimental methods are given in considerable detail. The numerous drawings and the experimental data in tabular and graphic form make this feature of the work very valuable to both student and investigator.

The author has attempted to present the material from the pedagogical as well as from the experimental standpoint. A knowledge of the fundamentals of chemistry, physics and mathematics (calculus) is presupposed. Where higher mathematics is employed, the development is more fully given. If the remaining three books are up to the standard of their first book, the work will indeed be a real contribution to this field of science.

JOSEPH M. BRAHAM.

Notions Fondamentales de Chimie Organique. 6th edition. By CHARLES MOUREU, Membre de l'Institut et de l'Académie de Médecine, Professeur au Collège de France. Gauthier-Villars et Cie., Paris, 1919. vi + 552 pp. 14.5 X 23 cm. Price, 16 Fr.

This work is meant to give a thorough grounding in the fundamentals of organic chemistry, and is written for university students. It will be found less detailed than the usual American elementary text, especially in regard to industrial applications and theories of the mechanism of reactions. It seems to presuppose some familiarity with the laboratory behavior of organic substances.

The book is divided into two parts, each of which presents features of interest. The first chapter, a third of the whole in length, treats briefly those aspects of general and physical chemistry of most importance to organic chemists. A clear and readable but quite elementary exposition of the atomic and molecular theories, such as is usually given in a first year course in chemistry, is followed by an all-too-brief and dogmatic discussion of valence and structural formulas. A large number of methods for the determination of molecular and atomic weights are listed, but

without experimental detail. Substitution leads to homology, the classification of organic substances, and nomenclature.

In the section on stereochemistry which follows (33 pages) the author has allowed a desire for thoroughness to win him from that allegiance to symmetry and balance which distinguishes the rest of the book. The later use of the subject in the special part is hardly sufficient to justify so detailed an account. Up to and including the discussion of the relation of physical properties to chemical constitution, the reviewer is unconvinced of the value of the method of treatment used. If the book is meant for beginners, too much acquaintance with phenomena is implied, while students with sufficiently rich backgrounds to get full benefit from the introduction certainly deserve a more comprehensive and interpretative treatment of the subject matter.

The most interesting part of the introductory chapter is that which deals with chemical kinetics, "active" molecules, and the general contrasts between organic and inorganic reactions. Here a dash of calculus is somewhat apologetically introduced, and the laws of reaction velocity and equilibrium are clearly and usefully stated, without thermodynamic derivations. Chemical affinity and chemical potential, together with the influence of various forms of energy on reactivity, are treated in a simple and wholly non-mathematical way. Catalysis receives some attention. Considering its unavoidable superficiality and the infrequency of its use in the special part, the whole general introduction seems of questionable value.

Chapter II begins the systematic presentation of the chemistry of the hydrocarbons and their derivatives. The method of arrangement, the selection of the illustrations, and the *enchaînement* of the thought are all well suited to the purpose of the book: the development of that ability to "feel" what reactions will "go" and how they will go, which is of first importance in the training of a skilled structural chemist. Acyclic hydrocarbons of all series, with their halogen and nitro derivatives, are followed by the cyclanes and the aromatic series. Here in addition the sulfonic derivatives are introduced, and the chapter ends with 2 pages on the terpenes. Alcohols, ethers and phenols are next discussed at length, followed by aldehydes, ketones, and quinones. The acids, particularly aldehyde- and ketonic acids, lead naturally to the sugars, their stereochemistry and synthesis, and the chapter concludes with other carbohydrates and glucosides.

In Chapter IV amines and diazo compounds, nitriles, isonitriles and amides are followed by the ureids and the purine group. "Inorganic" derivatives receive scant attention. A dozen pages on heterocyclic compounds conclude the systematic part.

Dyestuffs are reserved for the final chapter—a 40-page monograph,

which is a model of ordered arrangement and judicious exclusion. This chapter does not form a necessary part of the whole and might have been omitted without impairing the development of the thought; or, of course, any number of similar chapters (poisons, perfumes, etc.), might be added in the same way.

The table of contents is adequate and the index quite unusually detailed and complete for a French text. There are no cuts. The typography is excellent on the whole, though occasionally one misses the third bond of a triple linkage, and Mr. Shields might well object (p. 24) to the teutonization of his name to Schields. The spelling both of "εναριθια" (p. 79) and of its French derivative may possibly be charged to the printer. Very little is said about the probable mechanism of organic reactions, and such important subjects as the behavior of nitro-compounds and tautomerism do not seem to receive adequate treatment. When the mechanism of a reaction is discussed, the presentation is unfortunately too often dogmatic and unsupported by evidence. The absence of illustrations of industrial applications combined with the latter characteristic puts a rather severe strain upon the attention and risks making the close-knit and very condensed account seem *monotonous*.

In particular cases, this extreme condensation leads to positive inaccuracies, as when (pp. 171-172) in the 2-page discussion of conjugated systems of ethylene linkages and the theory of partial valences, one is left with the impression that 1-4 addition is the invariable rule in such systems, or when on p. 190, the author says of *trimethylene* (hexamethylene, and the cyclanes in general), "they have not the chemical characteristics of unsaturated hydrocarbons—thus with chlorine and bromine they give substitution— and never addition-products." Binary mixtures (p. 106) do not "always melt much lower" than their components. The author uses "quadri-" and "tetra-valence" with a hearty indifference and does not scruple to describe lack of reactivity as "stability." On pp. 8-9 some of the statements regarding the molecular condition of various forms of matter might be made with more reserve.

Certain peculiarities of emphasis are hard to understand, but, on the whole, the selection has been excellently made, and the book is a fine example of French mastery of form and *mesure*. NORRIS F. HALL