

5. Conclusions.

The hydrolyses of the esters by the amino acids and polypeptides which are described in this paper are in themselves not unexpected. The interesting feature of these actions is however their selective character. With amino acids which differ from each other to such a small extent as glycine and phenylalanine, and with the similar esters methyl acetate and ethyl butyrate, glycine has the greater action on ethyl butyrate, and phenylalanine on methyl acetate. The greater action of the dipeptides on ethyl butyrate and of the dibasic amino acids on methyl acetate is also of interest. This selective action with different esters is strongly suggestive of the selective action of lipases from different sources with different esters. It seems probable that many of these selective actions of the lipases may be reproduced with amino acids and polypeptides of varying structure or in the presence of other substances.

On the other hand, there is no evidence that the hydrolytic action of lipase is to be attributed to amino acids or polypeptides. The specific groupings present in the amino acids or polypeptides which show this activity may be present in more complex substances such as the proteins, and from this point of view the study of the hydrolytic actions of the decomposition products, such as the amino acids from preparations possessing lipolytic activity, and of the more complex polypeptides or other substances synthesized from them, may throw light upon the substances capable of causing such lipolytic action. The study of the influence of various added substances upon these hydrolytic actions is a necessary accompaniment of an investigation of this nature.¹

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NEW BOOKS.

The Elements of Qualitative Chemical Analysis, with Special Consideration of the Application of the Laws of Equilibrium and of the Modern Theories of Solution. By JULIUS STIEGLITZ, Professor of Chemistry in the University of Chicago. Two Volumes. Vol. I, Parts I and II. Fundamental Principles and their Application. pp. x + 312. Vol. II, Parts III and IV. Laboratory Manual. pp. viii + 151. New York: The Century Co. 1911. Price, I, \$1.40; II, \$1.20.

The first volume of this text on qualitative analysis represents the greatest advance in the presentation of the principles of analytical chemistry which has been made since the publication in 1894 of the first edition of Ostwald's "Wissenschaftliche Grundlagen der Analytischen Chemie."

¹ A large number of experiments were carried out in which glycine, alanine, phenylalanine, and tyrosine, in the presence and absence of acids and alkalis in solutions of known H⁺ ion concentration, and also in the presence of phosphates, were dissolved with cane sugar in water and the optical rotations determined at stated intervals. No evidence was obtained in any of these experiments to show that the amino acid affected the course of the hydrolysis of the cane sugar in any way.

The revised editions of the latter book have failed to keep pace with the rapid progress of the subject, and this makes the present work doubly welcome. It is remarkable that so much important theoretical material could remain so long without expression in the form of a text, but Professor Stieglitz has now succeeded in bringing together in an elementary form practically all of the physico-chemical work which bears upon the problems which arise in the analytical study of aqueous solutions. Indeed, although elementary in its nature, there is perhaps no other book which so well presents a survey of the important fundamental problems which the workers in the field of the theory of solutions are now endeavoring to solve. That this has been done so well in an elementary text is explained by the fact that the author, *contrary to the usual practice*, believes in considering his subject as still in the making, and in presenting it in such a way as to produce a thinking, productive chemist. To this end frequent discussions are presented as to the present views of different schools of physical chemists upon disputed points, and these are often accompanied with illuminating suggestions as to the methods which will most effectively lead to a settlement of the question at issue. Throughout the text frequent references are given to the original literature. "Finally, to arouse and develop the critical questioning attitude of the professional chemist, . . . the subject matter of the laboratory work, given in Part III, is put largely in the form of questions, which demand not only careful observation on the part of the student but also a thoughtful interpretation of the observations made." These questions upon the preliminary experiments for the different metals and acids are so put that they force the student to gain a mastery over the theoretical part of the work.

Part I treats of such subjects as osmotic pressure, electrolytic dissociation, the electron theory of valence, chemical equilibrium, colloids, and the solubility product, and Part II deals with the application of the principles to such problems as the analytical treatment of amphoteric substances, the hydrolysis of salts, fractional precipitation, precipitation with hydrogen sulfide, the theory of complex ions, and ends with two valuable chapters on the theory of oxidation and reduction from the standpoint of potential differences. The oxidizing power of permanganic acid is, for example, represented by the value of the constant $k = \text{Mn}^{++++++}/\text{Mn}^{++}$ for the reaction $\text{Mn}^{++++++} \rightleftharpoons \text{Mn}^{++}$. The treatment of the subject is not a quantitative one, but the values of the constants are considered in order that the student may learn to judge for himself as to the direction which an oxidation-reduction reaction will take.

Part IV contains the directions for the solution and systematic analysis of inorganic substances. The methods of analysis give good results, but it is to be expected that each instructor will, in teaching, modify

this part of any text on quantitative analysis to suit his individual preferences. The choice of solvents to suit the properties of the substances to be dissolved is a good feature of the scheme, as is also the preliminary extraction of lead and silver salts from the insoluble portion.

Although much of the theoretical material in this book is far more advanced in its nature than that usually contained in texts on qualitative analysis, the theoretical and the analytical work have been so skilfully interwoven, and the presentation is so clear, that the book may be used successfully in colleges where the students begin the subject with only a good high school course as a preparation, and it is found that such students enjoy particularly the theoretical part of the text. Indeed, actual experience has proved to the writer of this review that this is the most "teachable" chemistry text he has ever used. May the day come quickly when a text of the same type will appear for the subject of physical chemistry!

It will be difficult for the Century Co. to secure other texts which will at all deserve a place in the same series with their first two chemistry publications.

WILLIAM D. HARKINS.

A Handbook of Organic Analysis, Qualitative and Quantitative. By HANS THACHER CLARKE. With an introduction by J. Norman Collie. 1911. London: Edwin Arnold. viii + 264 pp. Longmans Green & Co., New York. Price, \$1.40.

"It is by no means easy to arrange a general plan for testing organic compounds so that one can say for certain what the particular compound may be. But as organic chemistry is an eminently practical science, there ought to be good practical books dealing with the subject—books where the descriptions are concise, where the treatment of the subject is systematic and not merely an enumeration of special tests for special compounds and where the student has to use his head as well as the information supplied by the text-book. Mr. Clarke has, in this book, recognized these requirements."

The material is arranged as follows: 1. Preliminary investigations: purity, qualitative tests for the elements, tests for approximate constitution. 2. Examination for radicles. 3. Separation of mixtures of organic compounds. 4. Classified tables of common organic compounds; examination of alkaloids and dyestuffs. 5. Quantitative determination of constituent elements. 6. Quantitative determination of radicles. 7. Determination of some physical properties. Index.

The method of identification is divided into four parts: tests for the elements; tests for certain classes of compounds, depending upon the elements present; tests for various salient radicles in the molecule; determination of constants and identification through the tables. As is the case with any complex method, its value can be determined only by actual laboratory experience. The tables of organic compounds, while

not as complete as those found in Mulliken contain all of the commoner compounds, arranged in classes according to their boiling points or melting points and for most examinations will prove satisfactory. The book is far from up-to-date in its quantitative methods, the better and shorter modern laboratory practice being omitted. Thus, we do not find the Dennstedt or the electrical methods for carbon and hydrogen, the sodium peroxide or the Stepanow methods for halogens or the sodium peroxide method for sulfur. The Dumas method for nitrogen needs revision and the later methods for molecular weight and vapor density need to be added. The work is well printed and very free from typographical errors. The book furnishes much material in a small compass and will be of assistance to any one testing organic substances. CLARENCE J. WEST.

The Chemistry of the Radio-Elements. By FREDERICK SODDY, F.R.S., Longmans, Green and Company. pp. 92. Price, 2s. 6d.

A number of excellent books have been published dealing with radioactivity in general, but primarily from the standpoint of the physicist. The present volume will therefore be welcomed by chemists as it gives a comprehensive but succinct account of the chemistry of the radio-elements. There is probably no one better adapted to write the book than Prof. Soddy, and the result has been a volume not too technical for the average chemist and at the same time detailed enough and sufficiently up-to-date to make it indispensable to the chemist who is doing work on radioactivity. The first chapter deals with a general description of radioactivity, the second with radioactive constants and the third with the classification and nomenclature of the radio-elements. Each of these elements is then taken up and its chemistry discussed in some detail. If one were disposed to criticize what is really an excellent work it might be suggested that the first chapter, "A General Description of Radio-Activity," is not detailed enough for the chemist who has not previously given some attention to the subject and entirely superfluous to the one who has. In a second edition the list of references should be fuller.

R. B. MOORE.