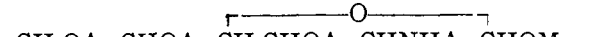
This would indicate the structure:



$CH_2OAc.CHOAc.CH.CHOAc.CHNHAc.CHOMe.$

The compound is easily soluble in water, alcohols (methyl, ethyl, isobutyl and isoamyl) and glacial acetic acid; it is difficultly soluble in acetone and warm ether, but practically insoluble in chloroform, the hydrocarbons, and ethyl and amyl acetates.

NEW BOOKS.

Introduction to General Chemistry. By JOHN TAPPAN STODDARD, PH.D. Published by The Macmillan Co., New York, 1910. xviii + 432 pages.

This small text-book of elementary chemistry is intended to be used in connection with lectures or recitation talks and discussions. It contains a concise account of some of the more important facts of descriptive chemistry and of those laws and theories that are usually considered in elementary courses. The order of arranging the elements is somewhat different from that usually followed, in that sulfur and sulfuric acid come immediately after oxygen and hydrogen, and precede the halogens. This is done, as the author states, for the purpose of "placing sulphuric acid in the position which it occupies in actual practice." The periodic law is not mentioned until the last chapter. Quantitative relations receive considerable attention and the student is referred for the details of these experiments to the author's "Quantitative Experiments." The appendix contains a number of useful tables.

Taken as a whole the book is carefully written and when used in connection with a course of lectures and discussions will undoubtedly aid the student in laying a good foundation upon which he can build in more advanced study. EDWARD H. KEISER.

Qualitative Chemical Analysis, Organic and Inorganic. By F. MOLLWO PERKIN, Late Head of the Chemistry Department, Borough Polytechnic Institute, London. Third edition, 337 pages. Published by Longmans, Green & Co.

In the preface the statement is made by the author that in the teaching of chemistry "the theoretical knowledge is generally kept rigidly apart from the facts practically gained, so that the student loses all the mutual help which the two branches of study afford each other," and, that, recognizing this difficulty, he has endeavored "to write a book in which theory and practice are more or less dovetailed." Nevertheless, in the opinion of the reviewer, the author has, in the inorganic part, kept the theory introduced fairly well separated from the practical work. The things which in reality are more or less dovetailed in the book (pp. 25–152) are dry tests, metathetical test-tube reactions, and descriptive chemistry. The theory, given for the most part in the form of dogmatic statements, is largely concentrated in the 13 pages of Chapter II. Mass action is

introduced with the heterogeneous equilibrium, $CaCO_3 \rightleftarrows CaO + CO_2$, after which follows the statement that "the velocity of the reaction at any instant is proportional to the concentration of the reacting substances." Such a treatment is well calculated to confuse the beginner.

The directions for the detection of lead in the copper group (p. 172) are faulty, and on p. 173 it is stated that the residue left upon boiling the hydrochloric acid precipitate from the yellow ammonium sulfide solution with concentrated hydrochloric acid is As_2S_3 (instead of As_2S_5). The book contains a number of other chemical errors. For example, on p. 28, $AgNH_3^+$ is described as a complex ion derived from NH_4^+ by the substitution of silver for 1 hydrogen atom; the complex is really $[Ag(NH_3)_2]^+$. On p. 32, Hg_2NH_2Cl is "aminomercurous chloride," but on p. 33 it has become "mercurous ammonium chloride;" the black substance really is $NH_2HgCl + Hg$. On p. 246 chloroplatinic acid is called "hydroplatinic acid;" on p. 40, $CuSO_4,4NH_3 (= [Cu(NH_3)_4]SO_4)$ is referred to as a copper ammon*ium* compound, and "ferric hydroxide," on p. 73, line 10, becomes, on line 11, the antiquated "ferric hydrate." As a final example of the author's independence in matters of nomenclature and chemical theory, it is stated on p. 79 that with nickel salt solutions "ammonium hydroxide gives a voluminous greenish basic precipitate which is readily soluble in excess, a deep blue solution of a complex nickel ammonium salt $[Ni(NH_3)_6SO_4]$ being formed. *Consequently* in presence of ammon*ium* salts no precipitation takes place." Non-formation of a precipitate here, of course, is due to the repression of the hydroxyl-ion concentration by the common ion of the ammonium salt.

In Part II, the author apparently has sought to devize a scheme of qualitative organic analysis for students who have not previously been trained in organic chemistry nor had a systematic course in organic preparations; but nevertheless, in his summary (p. 314) he admits that "separations can only be carried out by the student having an intimate acquaintance with theoretical as well as with practical chemistry." Here again he seems to have failed of his purpose to dovetail theory with practice, since the former is exceedingly meager as compared with the empirical facts presented, but perhaps this is due to the nature of the subject. The tests depend in the main upon salt formation or color changes, and no attempt is made to substantiate the indications thereby furnished by the preparation, isolation and characterization of derivatives. In the test for nitrogen, p. 202 (2.), the directions are faulty. The fact that no general scheme of separation can be developed for organic substances shows the hopelessness of such a system of qualitative organic analysis.

For the portion of this review dealing with Part II of the book the writer is indebted to the kindness of Dr. C. G. Derick. G. McP. SMITH.

Die Anlauffarben, eine neue Methode zur Untersuchung Opaker Erze und Erzgemenge. By DR. MAX LEO. pp. 74 and 1 colored plate. Theodor Steinkopff, Dresden, 1911. Price, 2 M.

The study of opaque minerals and metals in polished sections under the microscope has heretofore depended upon the principle that their polished surfaces reflect light with characteristic peculiarities. The method described by Leo depends upon the fact that different substances possessing a metallic luster tarnish differently under the influence of certain reagents and that if the substance be crystallin the same crystal faces will be similarly tarnished, while different faces will exhibit different tarnish colors.

The method is separable into two parts: Certain minerals when polished are affected by decomposing agents in such a way as to yield distinct and characteristic tarnishes that may easily be distinguished under the microscope in reflected light. By comparing the colors on their various surfaces the particles may be oriented and their crystal systems determined. In cases in which characteristic colors are not produced by simple treatment with reagents, the thin polished slice is treated with a reagent while a galvanic current is passed through it. Under these conditions, if the proper reagent be selected, a characteristic tarnish will usually be produced.

The little brochure gives detailed directions for carrying out the tests and concludes with a table containing the author's observations on a number of common minerals. This table records the behavior of polydymite, pyrite, marcasite, linneite, millerite, barnhardtite, pyrrhotite, chalcopyrite, cubanite and bornite under the influence of 13 sets of conditions.

W. S. BAYLEY.

RECENT PUBLICATIONS.

Annales de la science agronomique française et étrangère. Paris: L. Grandeau. 8°, Année 1911 (2 volumes en 6 fascicules). 22 M.

Analyse des Harns. 11 Aufl. von Neubauer-Huppert's Lehrbuch. 1 Hälfte. Wiesbaden: C. W. Kreidel. 8°, 15 M.

ANDÉS, L. E.: **Die Fabrikation der Flaschen- und Siegellacke.** 3 M. **Verarbeitung des Horns, Elfenbeins.** 2 Aufl. 3 M. Wien: A. Hartleben.

BANG, J.: **Chemie und Biochemie der Lipoide.** Wiesbaden: J. F. Bergmann. 8°, 66.5 M.

BARR, J. A.: **Testing for Metallurgical Processes.** San Francisco: Mining and Scientific Press. 12°, 216 pp., $2.00.

BASKERVILLE, C. AND CURTMAN, L. J.: **A Course in Qualitative Chemical Analysis.** Macmillan.

BAYLISS, W. M.: **The Nature of Enzyme Action.** 2nd Ed. Longmanns. 8°, 3s, 6d.

BENRATH, A.: **Chemische Konstitutionsbeweise.** Heidelberg: C. WINTER. 1.20 M.