

In summary: The photogenic compound present in the *Lampyridae* is much more stable towards atmospheric oxygen than has usually been thought, especially when dried out of contact with the air; it presents points of similarity to other known biological products; from embryological and chemical considerations it appears probable that it is an albuminous lipid (phosphatide).

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WASHINGTON, D. C.

 NEW BOOKS.

Messungen elektromotorischer Kräfte galvanischer Ketten with wässrigen Elektrolyten. By R. ABEGB, FR. AUERBACH AND R. LUTHER. Wilhelm Knapp, Halle, 1911.

The purpose of this exceedingly valuable number of the series (No. 5, "Abhandlungen deutschen Bunsen-Gesellschaft") is to summarize all the observed electromotive forces of reversible systems in order that they may be available for the consideration of the general problem of affinity. The work is divided into three parts: the first containing a chronological list of all the systems which have been studied; the second a systematic selection of the most reliable results, grouped together under the elements considered; while the third is devoted to the consideration of single or normal potentials.

The great value of this work for the purpose of reference will be apparent from the above; even a glance through it shows that it should be found on the desk of every investigator. J. L. R. MORGAN.

Handbuch der Mineralchemie. By C. DOELTER, with the aid of more than fifty associates. In four volumes, 50-60 parts (bogen). First part of Vol. I, 160 pp. Price, M. 6.50. Th. Steinkopff. Dresden. 1911.

The introduction of this new work by Prof. Doelter is short and to the point, and in it the general problems of the subject are, for the most part, well stated. The work is of the widest scope, aiming to give in a more complete way than any other extant the data in this department of chemistry. Besides matter on mineral synthesis, the genesis of minerals, etc., articles are promised on silicate melts, cement silicates, glasses, slags, artificial gems, and the manufacturing processes for technically important minerals.

No strikingly original element, either of classification or method of treatment, appears; it may therefore be expected that the chief value of the book will be as a compilation of data and as an index to literature. In these respects the first instalment seems to be very complete, though only time and use can determine their accuracy.

To judge from these first printed pages, the most general criticism to be passed on the work is that it does not lay sufficient stress on the quantitative side of the subject. No quantitative data at all are given on the optical characteristics of the important carbonates of calcium, magnesium and iron, necessary as these are to the analysis of mixtures, and important as physical constants. The characterization of vaterite, about which much is said, is not based on sufficient quantitative data (p. 114) to satisfy the reader that it is really a distinct form of calcium carbonate. No doubt geological speculation regarding the genesis of minerals has a rightful place in a work of this kind when its foundation is not too meager; it is germane to the subject, is often suggestive to the investigator, and will save much reference-hunting; but it seems to the writer that it forms too large an element here. It is hardly pardonable in a scientific text-book to include so much under the heading "it is possible" (p. 133).

The qualitative viewpoint crops out strongly in this statement of Doelter (p. 8): "In no case, however, is it admissible to designate an artificially prepared anorthite, diopside, ruby, simply as anorthite, etc., since these names belong exclusively to the natural products." We must take care here not to confuse the essential properties of a mineral and its genesis in nature. Anorthite and diopside have been prepared in the laboratory which possess all the essential properties of each. This can be settled and has been settled by quantitative measurements of these properties. True, the minerals of nature are rarely pure, and it

is obviously the pure "end members" of the solid solutions in nature which have the first claim to a determination of their constants; constants of the others are valueless unless the composition is also known. Doelter's statement that a synthetic mineral, "in order to deserve the name "mineral" "must possess all the properties of the natural product, essential as well as secondary," must be interpreted in the light of the above. Natural specimens of the same mineral vary as much from one another as they do from the pure synthetic product, and it is also certain that the same mineral in nature is often formed in a number of different ways.

The statement (p. 8) that the artificial sapphire is isotropic is incorrect; many, if not all, the artificial rubies and sapphires now on the market are single uniaxial crystals.

This first instalment of *Mineralchemie* treats of the forms of carbon; Diamond by Doelter, Graphite by Amberg, and Schungite by Heinisch; the Carbonates of Calcium, Magnesium, and Iron, by Linck, a beginning of the Carbonates of Sodium by Wegscheider, and Analytical Methods by Dittrich and by Kaiser.

E. T. ALLEN.

Die Kristallgruppen. By DR. E. SOMMERFELDT. Dresden. Theo. Steinkopff. 1911. pp. 79, Fig. 64. Price, 3 M.

The author describes a series of models with which may be illustrated the essential features of crystal structure, in a manner more easy of comprehension than is possible with models constructed on the principle of the Sohncke point system. The new models of the simpler structures are made of needles on which balls are strung at definite intervals. These needles are struck into supports in such a way as to cause the balls to be spaced in accordance with the fourteen Bravais types of structure (Raumgitter). Stereoscopic photographs of these arrangements, with the simple crystal forms corresponding to them, are printed in the proper positions for viewing through an ordinary stereoscope. The illustration of hemihedral and other partial forms is accomplished by replacing the balls with little bars arranged along the needles with their long axes in parallel directions or in directions that have spiral relations with one another, like the arrangement of leaves on a stem.

W. S. BAYLEY.

Journal of the Washington Academy of Sciences. Published semi-monthly except July, August and September, when monthly. Subscription price, to members for annual dues, to members of affiliated societies, \$2.50; to others, \$6.00. Does not exchange with other publications.

A journal for the publication of short papers in any science. It may serve a useful purpose as a medium for scientific news in this large colony of scientists, and in acquainting the scientific men of Washington with the work of their fellows in other lines; also in some cases in affording an

opportunity for the publication of certain articles which would otherwise have to wait over long. However, it is much to be hoped that this new journal will not prove a temptation for the unnecessary multiplication of papers or a vehicle for half-done ideas with which the pages of science are already overburdened.

E. T. ALLEN.

Neuere Erfolge und Probleme der Chemie. VON EMIL FISCHER. Julius Springer, Berlin. 1911. pp. 30.

No essay from the pen of the great master of organic chemistry could fail to attract attention, and every one concerned with the progress of civilization will find interest in this brief paper. Here is recorded the report of an experimental lecture, delivered in the presence of the Emperor on the occasion of the foundation of the two great Kaiser Wilhelm chemical research laboratories. It will be remembered that the endowment of these institutes was the chief feature of the hundredth anniversary of the founding of the University of Berlin. In the lecture, the remarkable progress of chemistry during the last few decades is sketched in vivid words. The chemistry of high and low temperatures, radioactivity and organic synthesis (especially of products of value to medicine and commerce) are all touched upon, as well as other striking aspects of the rapidly developing science.

The founding of these laboratories under such favorable auspices gives yet another impulse to the study of chemistry in Germany; and one cannot but hope that other nations, especially our own, will follow Germany's good example.

T. W. RICHARDS.

National Notebook Sheets for Laboratory Work in Chemistry. By ARTHUR S. DEWING. L. E. Knott Company, Boston. 8.5×10 ins. single sheets, \$1; complete book, \$1.64.

This is a laboratory manual arranged on the loose leaf plan; the directions for performing each of the eighty or so experiments are on single sheets. Many experiments are supplemented by exercises which consist of questions bearing upon the preceding experiments and of topics for written exercises and compositions. Descriptive matter under the caption of "Notes" is inserted at frequent intervals. The experiments and descriptive text cover about fifteen topics, including, besides those usually found in high school books, thermochemistry and electrochemistry. The illustrations are numerous and as a rule quite helpful, though occasionally superfluous; for example, the ordinary test-tube rack with four test-tubes appears no less than twenty times. If any criticism were to be offered of the book as a whole it would be the inclusion of experiments on Faraday's Law, Chemical Equilibrium, and Mass Action.

There are but few errors in the book; one important one should be noted. The author in Notes A 20 and A 40 has fallen into the difficulty

of trying to make the older definitions of acids, bases and salts coincide with the newer definitions; doubtless this error will be corrected in subsequent editions.

On the whole the author's purpose, namely, to prepare experiments, exercises, and descriptive matter in a flexible manner for high school pupils, has been well accomplished.

L. C. N.

Qualitative Chemical Analysis. By W. W. SCORR. New York, D. Van Nostrand Company. 14 x 22 cm., pp. 165. Cloth. Price, \$1.50.

"The purpose of this manual is to furnish a practical, modern guide for students studying Qualitative Analysis." The modern character refers to the brief statements of the electrolytic theory of solutions, of reversible reactions, the law of mass action, solubility product, and amphoteric electrolytes. In attempting the utilization of the ionic theory many of the expressions are loose and peculiar: "depends on the degree of dissociation of the H^+ and the acid radical." The terms used presuppose considerable familiarity with the general conceptions of Physical chemistry or the expenditure of a large portion of the class-room time in order to make the student familiar with these ideas. The methods employed are well chosen and generally the descriptions of the processes are clear and the arrangement comparatively easy to follow. There is a tendency, however, to crowd the schemes, which detracts from the workmanship of the book; otherwise it presents a good appearance. There are not many typographical errors: on page 116 W. M. Noyes should read A. A. Noyes, p. 95 ni^+ should be Ni^+ , etc. One of the main features of this work is the introduction of general descriptive chemistry, which occupies nearly one-sixth of the text. The properties and occurrence of the elements and their compounds are listed and in many cases rare and uncommon occurrences are given. It is a question whether it is advisable to incorporate so much of this descriptive matter in a text on qualitative analysis, as the student is already provided with this in his general text on chemistry. Another feature is the introduction at the beginning of the discussion and separation of each group of a list of reagents to be used. There is also a list of all reagents used with their strength expressed in normal and gram or per cent. concentration given in the Appendix. Many of the reagents are thus listed many times, which is an unnecessary duplication and the particular reagent is also stated in the description of the process. The scheme for the analysis of metals and alloys is not all that is desired. The abbreviations A. w. for atomic weight and S. g. for specific gravity are not the ones usually employed.

A. T. LINCOLN.

Die Bestimmungsmethoden des Wismuts und seine Trennung von den anderen Elementen. VON PRIVATDOZENT DR. L. MOSER. (*Die chemische Analyse. Sammlung*

von Einzeldarstellungen auf dem Gebiete der chemischen, technisch-chemischen und physikalisch-chemischen Analyse. Band X.) 16 x 25 cm., pp. 126. Stuttgart: Ferdinand Enke, 1909. Price, paper, 4 marks.

The historical account is followed by a description of the occurrences of bismuth and then there is given the methods for obtaining metallic bismuth and an enumeration of its properties and uses. The main portion of the book is devoted to the qualitative and quantitative methods for its detection, separation and estimation. Under the qualitative methods are given the qualitative reactions, microscopic tests, dry tests, and methods for separation from other elements. The quantitative methods are described under the following headings: 1. Gravimetric, wherein bismuth is determined as the oxide, metal, oxychloride, phosphate, sulfide, molybdate, sulfate, arsenate and chromate. 2. Volumetric, which includes the chromate, iodate, arsenate, oxalate, hypochlorite, sulfide, molybdate and phosphate methods. 3. Colorimetric. 4. Gasometric. 5. Electroanalysis. 6. Methods for the separation of bismuth from the other metals—this comprizes about one-fifth of the text. 7. Special methods are listed for the analysis of special compounds containing bismuth, such as alloys as well as organic and pharmaceutical preparations. The author considers the phosphate method the best and it can be used either gravimetrically or volumetrically, while the electrolytic methods, amalgam of Vortman and the wire gauze cathode of Brunck and the rapid methods of Fischer and of Sand are recommended. The work comprizes a comprehensive exposition of the methods which are well arranged with ample detail for use, and with references to the original literature.

A. T. LINCOLN.

A Systematic Handbook of Volumetric Analysis. By FRANCIS SUTTON. 10th edition by W. L. SUTTON and A. E. JOHNSON. Philadelphia: P. Blakiston's Son & Co. pp. xiv + 621. Price, \$5.50.

Of this standard work we are informed that nine editions, 15,750 copies in all, have been sold. The junior authors tell us in their editor's preface that the references are now printed at the bottom of the page, that the sections on the pipet, measuring flask and weights and measures have been rewritten, the data having been supplied by R. J. Glazebrook, of the National Physical Laboratory. The term normal solution has been defined more clearly as follows: "A normal solution of a reagent is one that contains in a liter that proportion of its molecular weight in grams which corresponds to one gram of available hydrogen or its equivalent." The most recent procedure for the technically complete analysis of ammoniacal liquors has been supplied by W. F. Carpenter. The section on ferrocyanides has been improved. Knecht's process for iron with titanous chloride is described. The determination of sulfur in iron and steel as carried out at the National Physical Laboratory is included. Under

magnesium, manganese, mercury, nickel, dissolved oxygen, sugars, titanium, vanadium, zinc, acetone, oils, fats and waxes, phenols, cresols, urea, water and sewage, new matter has been inserted.

EDWARD HART.

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