

showed the presence of a single component and confirmed the homogeneity of this material.

Neomycin A hydrochloride shows a positive ninhydrin test for amino groups, a negative Elson-Morgan glucosamine test, a negative maltol test, and a negative Sakaguchi test for guanido groups.

CONTRIBUTION FROM  
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#### A NEW METHOD OF SYNTHESIS OF HYDROGEN CYANIDE BY THE REACTION BETWEEN COAL AND AMMONIUM ALUM

Sir:

We would like to describe herewith a method of synthesis of hydrocyanic acid which, under a cursory search of literature, seems not to have been reported before.

A mixture consisting of 10 g. each of the powder of black coal (product of Manji Coal Mine, Hokkaido, Japan) and ammonium alum  $\text{NH}_4\text{Al}(\text{SO}_4)_2 \cdot 12\text{H}_2\text{O}$  is heated in a porcelain tube at  $400\text{--}500^\circ$  by means of an electric furnace. Air is passed through the tube at a rate of 100 cc. per minute by means of a water jet pump. When the reaction is over, white ashes remain in the porcelain tube. By this procedure 90–92% of the nitrogen of alum is converted into hydrogen cyanide. The hydrogen cyanide produced is caught by a 10% sodium hydroxide solution. The presence of  $\text{CN}^-$  in the sodium hydroxide solution is detected by the formation of prussian blue. The quantity of  $\text{CN}^-$  is determined by

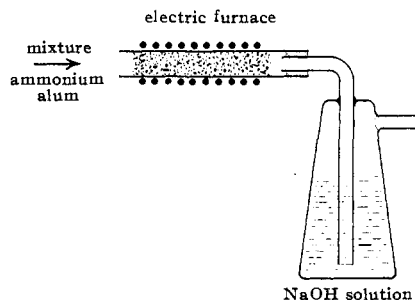


Fig. 1.—Electric furnace apparatus.

titration with a standard silver nitrate solution in the presence of  $\text{Cl}^-$ .

When coal alone is subjected to the above treatment, a small quantity of hydrogen cyanide is formed. Thus it is understood that a small fraction of the 90–92% yield is derived from the nitrogen of coal. When a mixture of coal and ammonium sulfate is subjected to similar treatment, 20–30% of the nitrogen in the ammonium sulfate is converted into hydrogen cyanide. The low yield is due to the noticeable sublimation of ammonium sulfate which takes place above  $400^\circ$ . A mixture of coke (or active charcoal) and alum gives only 2–3% yield. Coal containing iron gives rise to a poor yield. This might be due to the fact that the iron in coal decomposes hydrogen cyanide catalytically.

We find it highly interesting that the use of coal gives rise to a high yield of hydrogen cyanide out of ammonium alum.

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## NEW BOOKS

**The Chemistry of Penicillin.** Report on a Collaborative Investigation by the American and British Chemists under the joint sponsorship of the Office of Scientific Research and Development, Washington, D. C., and The Medical Research Council, London, compiled under the auspices of the National Academy of Sciences, Washington, D. C., pursuant to a contract with the Office of Scientific Research and Development. Editorial Board: HANS T. CLARKE, JOHN R. JOHNSON and SIR ROBERT ROBINSON. Princeton University Press, Princeton, New Jersey, February 14, 1949. x + 1094 pp. Illustrated.  $20.5 \times 28$  cm. Price \$36.00.

This volume is unique in the scientific chemical literature since it is a compilation of the results of unpublished cooperative investigations bearing on the chemistry of penicillin, performed in various laboratories in two different countries. The researches were withheld from publication during the war owing to the importance of penicillin as a military weapon. Declassification of the reports has per-

mitted an assembling of the details of the work in a logical and easily accessible form.

The material is presented in thirty chapters, the first a brief history of the chemical study of penicillin, and the last an appendix containing information as to the origin, date of issue, date of receipt of the individual progress reports and the location and names of the investigators. Each of the other twenty-eight chapters contains a table of contents and consists of a succession of well arranged papers covering either the consolidated results in a particular area from several laboratories or researches accomplished in one laboratory, in a form more or less similar to that found in scientific journals. Chapter topics are distributed according to organic chemical classification and physico-chemical techniques. It must be remembered that when the confidential reports were written it was never intended that they should be made available in their original form to a wider circle of readers. They were essentially interim reports, jottings from laboratory notebooks,

hastily produced and circulated so that all engaged in the urgent cooperative effort could take advantage of any recorded gain in knowledge. As a consequence, the published data are in certain cases not as complete as usually found in scientific articles and certain duplication is inevitably present.

The main virtue of a book of this kind is that the material in the penicillin field can now be found in one place rather than scattered through the scientific literature of two countries as it might have been. The volume contains an exceedingly wide range of topics covering such diverse subjects as X-ray diffraction, infrared studies, biosynthesis and assay methods. Some topics such as those on "Oxazoles and Oxazolones" and "Thiazolidines" are not particularly pertinent to what is now known about the structure of penicillin, but contain an extraordinary amount of interesting chemistry. These investigations were developed during the earlier stages of work on the general problem and have therefore been included. A Subject Index has been supplied so that the reader is able to locate a synthetic intermediate or degradation product studied experimentally in one or more laboratories.

The authors and editors deserve exceptional commendation for completing the Herculean task of coordinating dozens of reports, many sketchy in character, into a unified volume, for the benefit of scientists interested in the chemistry of penicillin. The book is attractively printed and is surprisingly free of errors.

ROGER ADAMS

**Practical Spectroscopy.** By GEORGE R. HARRISON, Professor of Physics, Massachusetts Institute of Technology, RICHARD C. LORD, Associate Professor of Chemistry, Massachusetts Institute of Technology, and JOHN R. LOUBOUROW, Professor of Biophysics, Massachusetts Institute of Technology. Prentice-Hall, Inc., 70 Fifth Avenue, New York, N. Y., 1948. xiv + 605 pp. 15 x 22 cm. Price, \$6.65.

This book is concerned with the techniques of spectroscopic measurements. In the first five chapters, spectroscopy and its applications, the selection of spectroscopic instruments, the characteristics of prism and grating spectrographs, and the testing, adjustment, and care of spectroscopic equipment are discussed. Subsequently, slit illumination, photographic methods, light sources, and the identification of spectrum lines are considered. There follows a brief review of the theory of atomic and molecular spectra. Several chapters are then devoted to the techniques of both emission and absorption photometry with particular emphasis upon absorption spectrophotometry and spectrochemical analysis. The book concludes with chapters devoted to the special techniques applicable to infrared, Raman, vacuum ultraviolet, and interferometric spectroscopy.

There has been a distinct need for a compilation of the modern techniques of spectroscopy. This book, which combines the viewpoints of its authors, a physicist, chemist, and biophysicist, provides the reader with "a comprehensive view of the status and possibilities of experimental spectroscopy as it exists today." The authors have added much to the usefulness of the text by including many bits of experimental "know-how" which usually are not recorded in the literature.

This book includes no discussion of the techniques of microwave spectroscopy. Although the authors state that they consider this field to be "outside the scope of this

book," a brief comparison of this new technique with conventional methods would be useful to many readers.

This well presented volume is a valuable text and reference book in any phase of spectroscopy for the beginner or even the experienced worker.

M. KENT WILSON

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## BOOKS RECEIVED

May 10, 1949-June 10, 1949

"NIELS BJERRUM: Selected Papers." Edited by Friends and Coworkers on the Occasion of his 70th Birthday the 11th of March, 1949. Einar Munksgaard, Norregade 6, Copenhagen, Denmark. 1949. 295 pp. kr. 18.

E. R. BLOUT, W. P. HOHENSTEIN AND H. MARK, Editors. "Monomers, Section I." Interscience Publishers, Inc., 215 Fourth Avenue, New York, 3, N. Y. 1949. \$7.50.

D. K. BULLEN AND THE METALLURGICAL STAFF. "Steel and its Heat Treatment. Volume III. Engineering and Special-Purpose Steels." Fifth Edition. John Wiley and Sons, Inc., 440 Fourth Avenue, New York, N. Y. 1949. 606 pp. \$7.50.

CARROLL WARDLAW GRIFFIN. "Inorganic Quantitative Analysis." The Blakiston Company, 1012 Walnut Street, Philadelphia 5, Pennsylvania. 1949. 368 pp. \$4.50.

RONALD W. GURNEY. "Introduction to Statistical Mechanics." McGraw-Hill Book Company, 330 West 42nd Street, New York 18, N. Y. 1949. 268 pp. \$5.00.

THOMAS ANDERSON HENRY. "The Plant Alkaloids." Fourth Edition. The Blakiston Company, 1012 Walnut Street, Philadelphia 5, Pennsylvania. 1949. 804 pp. \$14.00.

HARRY N. HOLMES. "General Chemistry." Fifth Edition. The Macmillan Company, Publishers, College Department, 60 Fifth Avenue, New York 11, N. Y. 1949. 708 pp. \$4.50.

H. C. HOTTEL, G. C. WILLIAMS, AND C. N. SATTERFIELD. "Thermodynamic Charts for Combustion Processes." Part I. John Wiley and Sons, Inc., 440 Fourth Avenue, New York, N. Y. 1949. 75 pp. \$2.60.

H. C. HOTTEL, G. C. WILLIAMS AND C. N. SATTERFIELD. "Thermodynamic Charts for Combustion Processes." Part II. Charts. John Wiley and Sons, Inc., 440 Fourth Avenue, New York, N. Y., 1949. \$2.40.

RAYMOND E. KIRK AND DONALD F. OTHMER, Editors. "Encyclopedia of Chemical Technology. Volume III. Carbon (cont'd) to Cinchophen." Interscience Publishers, Inc., 215 Fourth Avenue, New York 3, N. Y. 1949. 955 pp. \$20.00 per volume.

R. V. V. NICHOLLS. "An Introduction to Practical Organic Chemistry." Second Edition. Pitman Publishing Corporation, 2 West 45th Street, New York 19, N. Y. 1946. 266 pp. \$2.50.

ANDREW VAN HOOK. "Sugar. Its Production, Technology, and Uses." The Ronald Press Company, 15 East 26th Street, New York 10, N. Y. 1949. 155 pp. \$3.00.