

We gratefully acknowledge the coöperation of Miss E. W. Peel and Messrs. L. Chalet and C. E. Hoffhine, Jr., on experimental work, of Dr. J. B. Conn for the molecular weight determination, and of Dr. H. B. Woodruff and Mr. D. Hendlin for microbiological assays.

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RECEIVED SEPTEMBER 11, 1945

S-BENZYLTHIURONIUM SALTS OF SULFOBENZOIC ACIDS

Sir:

In a paper by E. E. Campaigne and C. M. Suter [THIS JOURNAL, 64, 3040 (1942)] which on account of the occupation of Denmark by the Germans has been unknown to me till now, where it has been reviewed in *Chem. Zentr.*, 116, I, 529 (1945), it is stated that whereas *o*-sulfobenzoic acid forms a neutral S-benzylthiuronium salt and

p-sulfobenzoic acid an acid salt, the *m*-sulfobenzoic acid does not form a salt with the same facility as the two other acids.

Some years ago [*Bull. soc. chim.*, [5] 5, 1153 (1938)] I prepared a series of S-benzylthiuronium salts of different organic acids amongst which were also the *o*- and the *m*-sulfobenzoic acids. The salt with *o*-sulfobenzoic acid was neutral with m. p. 205–206°, quite in accordance with the indications of Campaigne and Suter. The salt with *m*-sulfobenzoic acid was prepared without any difficulty, using our standard method of preparation: 0.01 equivalent of the acid is dissolved in 10 ml. water, the solution is partly neutralized with 1 *N* sodium hydroxide, till the reaction is just acid against methyl red, and a solution of 2 g. of S-benzylthiuronium chloride in 10 ml. of water is added. The acid salt of *m*-sulfobenzoic acid is readily precipitated and is filtered off. Recrystallized from diluted alcohol it showed m. p. 163–164° (cor.).

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STIG VEIBEL

RECEIVED JULY 26, 1945

NEW BOOKS

Discovery of the Elements. Fifth edition. By MARY ELVIRA WEEKS, Research Associate in Scientific Literature at the Kresge-Hooker Scientific Library, Wayne University. Illustrations collected by F. B. DAINS. Published by the *Journal of Chemical Education*, 20th and Northampton Sts., Easton, Pa., 1945. xiv + 578 pp. 343 figs. 16 × 24.5 cm. Price, \$4.00.

Nearly fifteen years ago, when a graduate student, this reviewer remembers reading with much pleasure Dr. Weeks' original articles in successive numbers of the *Journal of Chemical Education*, and wishing that they might be collected all in one book. The wish was granted soon thereafter, and apparently many others had the same feeling, as attested by the selling out of four editions in twelve years, each revised and amplified over its predecessor. The book now would almost serve as a history of chemistry in itself.

This new fifth edition shows an increase in text pages over the first from 363 to 578, and of pictures from 281 to 343. A comparison of the two books shows the expansion to have resulted from the normal process of adding new material, illustrations, and entries in the copious "Literature Cited." The original twenty-one chapters have been increased to twenty-seven by the addition of chapters dealing particularly with and presenting new matter concerning the lives and works of Daniel Rutherford, the de Elhuyar Brothers, Klaproth and Kitaibel (on tellurium), Charles Hatchett, Don Andrés del Río and J. A. Arfwedson. The Author deserves a renewed and amplified vote of thanks from the profession for re-issuing this book, which should be required reading for all college teachers, and be on the reserve reading list of all other chemists.

ALLEN D. BLISS

A Manual of the Aspergilli. By CHARLES THOM, Collaborator, Northern Regional Research Laboratory, Formerly Principal Mycologist, Bureau of Plant Industry, U. S. Department of Agriculture, Washington, D. C., and KENNETH B. RAPER, Senior Microbiologist, Fermentation Division, Northern Regional Research Laboratory, Bureau of Agricultural and Industrial Chemistry, U. S. Department of Agriculture, Peoria, Illinois. The Williams and Wilkins Company, Baltimore, Md., 1945. ix + 373 pp. 15.5 × 23.5 cm. Illustrated. Price, \$7.00.

This volume, the preparation of which has been based on the actual handling and culturing of the species described, is designed for the ready identification of the numerous strains of aspergilli encountered in microbiological work, either in biological research or in industrial microbiology, fermentation, and the food industry. The senior author, Dr. Thom, as a result of his studies for forty years, has long been recognized as one of the world's leading mycologists, and has previously been the principal author of what is probably the most authentic treatise on the aspergilli.

The present volume is undoubtedly of much less interest to the chemist than to the microbiologist. The latter will hail it as an exceptionally welcome addition to the literature in his field of study and practical operations. Nevertheless, the chemist who has sufficient biological background, and who wishes to broaden his knowledge of the fermentations and physiological phenomena in colorless plants, and the capacities of the fungi to produce breakdown changes in organic substances, can find great enlightenment in this book.

While avowedly written as a manual for the identifica-

tion of the various aspergilli by those already having extended knowledge of molds, the book has been planned on somewhat broader and more comprehensive lines, for the first six chapters, covering 78 pages, comprise a carefully and clearly written presentation of the main facts regarding this subdivision of the fungi. The first of these gives a brief historical review of the development of our knowledge of the group; the second presents the details of classification; the third is devoted to morphology and the minute description necessary in identification; the fourth and fifth, which will be especially appreciated by the industrial microbiologist, give detailed methods of cultivation, examination and preservation of species; and the sixth deals with the perplexing questions of variation.

The manual proper, use of which provides the means of identifying species, takes up the succeeding 207 pages, a chapter being devoted to each of the groups which are cleverly arranged in diagrammatic form in the prefatory chapter on the use of the manual. Keys to species based on color of the conidial heads and on the morphological characteristics are also provided. Each of these chapters is excellently illustrated by drawings and by photographs, some of which are in color.

The chemist will probably find his main interest in the next forty pages (289-330) where under the headings Topical Bibliography and General Bibliography there are exact references to the literature on the fermentations produced by aspergilli, including citric, fumaric, gallic, gluconic, itaconic, kojic and oxalic acids, and on the production of antibiotics and toxins, enzymes, and fats by these fungi. These bibliographies and a very extensive checklist of species and genera give the work a completeness which seems to leave nothing to be desired.

The book is excellently printed on calendared paper which enhances the beauty of the illustrations, the high quality of which has already been mentioned. It must be regarded as a masterly production, involving prodigious labor and most painstaking care in preparation and proof reading. The reviewer noted but two typographical errors, and these of trivial significance.

S. C. PRESCOTT

Schmierstoffe und Maschinenschmierung. By ERICH HERWIG KADMER. Verlag von Gebrüder Borntraeger, Berlin-Zehlendorf-West, Germany, 1944. 479 pp. RM. 20.80, geh.; RM. 22.40, gebd.

E. H. Kadmer's book on "Schmierstoffe und Maschinenschmierung" presents an excellent summary and a critical discussion of the research work in the field of lubrication. The author covers a great deal of material with unusual thoroughness. The bibliography at the end of each chapter gives a good survey of work published in recent years. The author, who is a chemist, states in the preface that the book was written with the aim of bringing together engineers, chemists and physicists for the solution of common problems.

The first edition published in 1939 was soon followed by a second edition in 1941. In 1944 this second edition was made available to readers in this country by a reprint of the Alien Property Custodian.

The first two short chapters, which have the character of an introduction, deal with the composition and manufac-

ture of oils. In the third chapter the author discusses at great length the characteristic values of oils, such as density, viscosity, color and fluorescence, pour point, flash point, and fire point, refraction and dispersion, optical and dielectric properties, specific heat and thermal conductivity, mean molecular weight, chemical analysis and C:H ratio, aniline point, saponification and iodine value and artificial aging of oils. There follow several short chapters on different lubricants, synthetic oils, special oils and tar oils, fatty oils and fatty acids, graphite as a lubricant, E. P. lubricants, coolants, cutting oils and greases. It is unfortunate that some of the physical concepts of lubrication such as surface tension, dipole moment and wettability are treated in the same chapter as the oil testing machines. There follows a more extensive chapter on bearing lubrication, including journal and thrust bearings, ball and roller bearings. This chapter concerns itself with lubricants and bearing materials rather than with the hydrodynamic aspects of lubrication. The last three chapters deal with lubricating appliances, lubrication of gears, and cylinder lubrication. The chapter on cylinder lubrication includes internal combustion engines, pumps, compressors, and steam engines.

Kadmer's "Schmierstoffe und Maschinenschmierung" is similar in scope and volume to T. C. Thomson's "Practice of Lubrication." However, the extensive discussion of recent research work and its lively criticism make Kadmer's book more interesting to read. Kadmer mentions in the preface that it is his aim to include all the material published in European and American journals. An inspection of the bibliography shows that the author covered the German literature more completely than the American publications.

B. W. SAKMANN

BOOKS RECEIVED

August 10, 1945-September 10, 1945

ALTON E. BAILEY. "Industrial Oil and Fat Products." Interscience Publishers, Inc., 215 Fourth Avenue, New York 3, New York. 735 pp. \$10.00.

SAMUEL M. McELVAIN. "The Characterization of Organic Compounds." The Macmillan Company, 60 Fifth Avenue, New York, N. Y. 282 pp. \$3.40.

GEORGE D. McLAUGHLIN AND EDWIN R. THEIS. "The Chemistry of Leather Manufacture." Reinhold Publishing Corporation, 330 West 42nd Street, New York, N. Y. 800 pp. \$10.00.

E. WERTHEIM. "Textbook of Organic Chemistry." Second Edition. The Blakiston Company, 1012 Walnut Street, Philadelphia 5, Pennsylvania. 867 pp. \$4.00.

LOUIS E. WISE. "Wood Chemistry." Reinhold Publishing Corporation, 330 West 42nd Street, New York, N. Y. 900 pp. \$11.50.

C. B. F. YOUNG. "Chemistry for Electroplaters." Chemical Publishing Company, Inc., 234 King Street, Brooklyn, New York. 205 pp. \$4.00.