brominating the copper derivative passes more or less rapidly into the γ-bromo isomer.

I have found that when the bromination is conducted as nearly as possible in the manner in which the ester is commonly chlorinated the product is the α-bromo ester. Thus when 22 g. of bromine was carried into 27 g. of aceto-acetic ester by a rapid current of air which both introduced the bromine as vapor and swept out the hydrogen bromide, the sole product was the α-bromo ester: with thio-urea it gave only amino-thiazol-carboxylic ester.

The action of bromine on aceto-acetic ester is therefore exactly the same as that of chlorine, and the differences heretofore observed are due to differences in procedure.

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Correction.—In the paper on "Preparation and Hydrolysis of Benzyl Esters" in the July, 1921, number of THIS JOURNAL, p. 1674, in lines 2 and 3, the words "salicylate product" should read "a product," and in line 11, the words "about 20°" should read "about −20°."

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NEW BOOKS.

Die Elektrometrische Massanalyse. (Electrometric Volumetric Analysis.) By DR. ERICH MÜLLER, Ord. Professor and Director of the Laboratory of Electrochemistry and Physical Chemistry at the Technische Hochschule, Dresden. Theodor Steinkopff, Dresden and Leipzig, 1921. vi + 110 pp. 19 fig. 15.5 × 23 cm. Price £0-8-3.

The scope of electrometric titration has been greatly extended during the past few years by the researches of Treadwell, Dutoit, and particularly of Pinkhof and of Liebisch. Moreover, these last mentioned authors have published their results in dissertations which are comparatively inaccessible. The present volume, therefore, containing a collection and critical discussion of this material, is decidedly opportune.

In it, the author first gives a clear and simple presentation of the theoretical principles underlying this method of analysis. He includes a discussion of those requirements which must be met if a given chemical reaction is to be utilized for electrometric titration, and of those measures which can be taken if an indicator-electrode fails to respond to either of the partial reactions involved in the chemical equilibrium.

Next, the author describes 4 general methods for the execution of electrometric titrations, and considers the relative advantages and disad-

vantages of each. Many practical suggestions are made for the execution of the measurements.

Finally, the author gives a compilation of those reactions which so far have been successfully utilized for electrometric titration. The list is already an imposing one, and includes among others the determination of silver, mercury, copper, cadmium, lead, hydrogen and zinc; chlorides, bromides and iodides, singly and together; sulfides, bromates, iodates, chromates, permanganates, vanadates and ferrocyanides.

This volume should certainly be of much value to chemists who contemplate using this simple and elegant means of analysis, or who wish to study its further extension or improvement.

ARTHUR B. LAMB.

Lehrbuch der Farbenchemie, einschliesslich der Gewinnung und Verarbeitung des Teers sowie der Methoden zur Darstellung der vor- und zwischenprodukte. (A Treatise on Color Chemistry, including the Production and Treatment of Coal Tar as well as the Methods for the Preparation of Crudes and Intermediates.) Second revised edition. By DR. HANS TH. BUCHERER. Otto Spamer, Leipzig, 1921. xi + 636 pp. 18 × 25 cm. Price unbound, 336 M.; bound, 364 M. in England.

Bucherer's treatise on dye-chemistry, after the manner of its kind, has grown vigorously during the brief interval between the first and second editions. The revised version begins the subject at an even earlier stage than the old, because it comments on present ideas as to the nature of coal, and gives an account of the interesting experiments of Fischer and Gluud on the extraction of coal with solvents and on low temperature coking.

The first chapter, which deals with coal tar and "crudes," has been extensively re-written. It brings German statistics on production, and German methods for handling the tar up to 1920. The latter seem to have changed little during the past decade. The author repeats, apparently with little faith, the reports that by the end of the war American production of toluene had reached 70,000 tons a year. The most interesting item in the section on "new methods proposed for dealing with the by-products of coking" is the account of Feld's elegant plan for ammonia recovery.

The organic chemist, who is not primarily concerned with dyes, will naturally turn with greatest interest to the chapter on "intermediates." This is much more than a bald account of the methods used for making the substances that are most important in the dye industry. It is a scientific treatise on a large part of aromatic chemistry; but the choice of subjects as well as the order in which they are presented is different from that of a regular treatise on organic chemistry. As it is stimulating to have more or less familiar facts presented from a different point of view, most organic chemists will, like the reviewer, find much that is

suggestive in this chapter. The sections dealing with the sulfonation of naphthols and naphthyl amines, the preparation of amines by the sulfite method, and the action of sulfites on nitro compounds deserve special commendation. It seems strange that the author should devote so much space to a discussion of benzene formulas and to an exposition of the simpler facts of orientation in a text that no one who does not know at least this much organic chemistry, is able to read. Presumably, he found it easier to develop his scheme without assuming any knowledge on the part of the reader than to decide on what may safely be assumed.

The third and final chapter, which describes the synthesis of dyes, is especially well done. A long section dealing with the relation between color and constitution, and a shorter one dealing with dyeing lay the foundation for a classification of dyes and for the introduction of the special terms used in dye chemistry. Then follow a number of sections describing the methods used for getting the various classes of dyes, much the longest being devoted to vat dyes. By writing mechanisms, some of them known, others assumed as plausible for the most general methods, and treating others as variations, the author manages to secure considerable cohesion for this brittle material. An illuminating running comment explains why certain compounds are important dyes while closely related substances are valueless. The chapter ends with an interesting account of natural coloring matters which includes Wilstätter's work on the anthocyanidines even though these have no technical value.

The volume is well printed on good paper. Marginal notes indicating the subjects discussed and an excellent index increase its value for reference. In "response to many requests" the author has supplied the new edition with an extensive bibliography, which is printed at the end. If this had been incorporated in the text it would be much more valuable. Where names are not given in the text the bibliography is of little use for verifying statements of fact or examining the evidence on which conclusions are based.

The book is successful and the second edition is better than the first. The dye chemist will want it in any case; but it can also be highly recommended as a valuable addition to the library of the organic chemist who is not primarily interested in dyes.

E. P. KOHLER.