chloroform and very soluble in alcohol or ethyl acetate. We have verified these statements except with reference to ether, which dissolves the crystals readily.

Methyltetronic Acid Amide.—One g. of methyltetronic acid lactone was dissolved in 30 cc. of cold ether and dry ammonia gas was passed through the solution for 20 minutes. An amorphous white precipitate settled out on the bottom of the flask. By rubbing it under ether with a glass rod for several minutes it became crystalline and could easily be filtered by suction. The yield was nearly quantitative. The substance was recrystallized from absolute alcohol, in which it was very soluble. The crystals were large plates which melted with decomposition at 135°.

A solution of 0.5404 g. substance made up to 25 cc. with water, using a 4 dcm. tube, showed a dextrorotation of 4.74 circular degrees; hence $[\alpha]_D = +54.8°$. Nitrogen was determined by the Kjeldahl method.

Calc. for $C_6H_{11}O_4N$: N, 9.40. Found: 9.30.

Optical Data on the Crystals of the Lactone and Amide.

Dr. Edgar T. Wherry has kindly supplied the following data:

Methyltetronic lactone under the microscope has the form of rods suggesting the rhombic system. The refractive indices, by immersion in oils, in which the substance is but slowly soluble, were $\alpha = 1.500$, $\beta = 1.515$, $\gamma = 1.535$, all ± 0.005. Double refraction strong, 0.035. In polarized light brilliant interference colors are shown, mostly of the third or fourth order. Extinction is straight. Elongation may be positive or negative. In convergent polarized light partial interference figures are frequently shown. The axial angle is large, $2E = 120° \pm 10°$. Sign positive.

Methyltetronic amide under the microscope shows irregular plates, of which the crystal system could not be determined. The refractive indices by immersion in oils, in which it appears to be insoluble, were $\alpha = 1.510$, $\beta = 1.530$, $\gamma = 1.560$, all ± 0.005. Double refraction very strong, 0.050. In polarized light brilliant interference colors of mostly second order were observed. No edges could be found on which to base extinction or elongation data. In convergent polarized light partial interference figures were often found, the axial angle being very large, and the sign probably +.

WASHINGTON, D. C.

NEW BOOK.

Essentials of Volumetric Analysis. By HENRY W. SCHIMPF, Ph.G., M.D., Professor of Analytical Chemistry in the Brooklyn College of Pharmacy. Third Edition. 366 + xiv pages. 61 figures. John Wiley and Sons, Inc., New York, 1917. Price, cloth, $1.60 net.

In the present, as in the earlier editions of this work, the United States Pharmacopeia has been taken as a basis, and the essential points have been reduced within the limits of a small book. The subject matter is arranged under 5 headings: Neutralization, Precipitation, Oxidation, Indirect Oxidation, and Iodimetry. The author has made some changes, discarding some obsolete processes and substituting new and up-to-date methods of analysis for them. Nomenclature has been revised in accord with the new

Pharmacopeia. For example, the abbreviation "cc" for cubic centimeter has been replaced by the abbreviation "mil" for milliliter, and other changes have been made. The introduction of several new assay processes, among them being the assays of mercuric salts, phosphates, and hypophosphates by means of a standard sulphocyanate solution, the assays of chlorates, perborates, chloral, acetone, resorcinol, phenylsulfonates, arsenates, and alkali cacodylate, etc., have improved the book considerably. The 2 chapters on indicators and their uses are of value.

The book is marred by the author's disregard of the principles underlying the retention of significant figures, a notable example of which occurs on page 316, where the weight of 18.70 mils of oxygen is given as 0.02680832 g. Of the 7 figures given, only 3 or at most 4, are significant figures. Errors of this sort in text books are largely responsible for the careless usages in journal literature.

The author also ignores the best and accepted customs of writing equations in a manner to indicate molecular quantities of gaseous substances. Among numerous examples of this is the following from page 230: $K_2CrO_4 + 8HCl = 2KCl + 4H_2O + CrCl_3 + Cl_3$.

The illustrations, which were the subject of criticism in earlier editions, have not been improved.

The fact that this manual has passed to a third edition indicates that it more or less perfectly meets the needs of students of pharmacy, for whom it is mainly prepared. It is likely to prove somewhat less satisfactory to the general student or practitioner in analytical chemistry.

L. F. HAMILTON.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY,
CAMBRIDGE, MASS.