

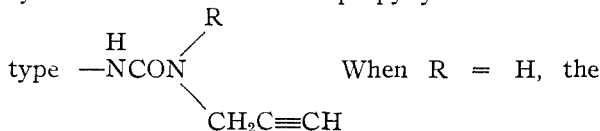
groups of isopropyl), a second doublet at 8.06 τ (CH_3 attached to a double bond) a quartet at 4.00 τ (single proton attached to olefin); the single proton of the middle carbon of isopropyl at 5.69 τ and the aromatic protons at 2.61 τ .

The fully saturated 2-imidazolidone V is obtained on hydrogenating III with platinum oxide in acetic acid as small colorless granules, m.p. 67.8–68.2°. *Anal.* Calcd. for $\text{C}_{13}\text{H}_{16}\text{Cl}_2\text{N}_2\text{O}$: C, 54.50; H, 5.58; Cl, 24.75; N, 9.77. Found: C, 54.10; H, 5.62; Cl, 24.80; N, 9.40. The infrared spectrum no longer shows the $\text{C}=\text{C}$ band at 6.15 μ .

V is identified unequivocally by synthesis with the urea IV. IV is prepared following conventional procedures: 2-propanolamine \rightarrow isopropyl-2-hydroxypropylamine \rightarrow isopropyl-2-chloropropylamine \rightarrow IV. IV is cyclized by treatment with sodium hydroxide in acetone to V, m.p. 67.7–68.2°. Mixed m.p. with hydrogenated III, (IV)

is not depressed and infrared spectra are identical. All elemental analyses are correct as required by theory.

The results of our investigation indicate that cyclization will occur with propynyl ureas of the



parent urea is regenerated on treatment with water or base presumably through formation of a carbodiimide. The reaction offers a simple and facile route to 1,3-disubstituted imidazolones. A discussion of the mechanism and scope of the reaction will be published shortly.

AGRICULTURAL RESEARCH DEPARTMENT
AGRICULTURAL CHEMICALS DIVISION
MONSANTO CHEMICAL COMPANY
ST. LOUIS 66, MISSOURI

P. J. STOFFEL
A. J. SPEZIALE

RECEIVED DECEMBER 7, 1961

BOOK REVIEWS

Azo and Diazo Chemistry. Aliphatic and Aromatic Compounds. By HEINRICH ZOLLINGER, Professor in the Eigenössische Technische Hochschule, Zurich, Switzerland. Translated by HARRY E. NURSTEN, Lecturer in the University of Leeds, Great Britain. Interscience Publishers, Inc., 250 Fifth Avenue, New York 1, N. Y. 1961. 444 pp. 17.5 \times 24.5 cm. Price, \$16.50.

This book bears a close relationship to the German-language book by the same author, "Chemie der Azofarbstoffe," Birkhäuser Verlag, Basel, Switzerland, 1958; but the relationship is not the simple one of translation from German to English, or even of second edition to first with translation as an extra flourish.

"Chemie der Azofarbstoffe" dealt exclusively with the chemistry of aromatic diazonium and azo compounds. Throughout, its point-of-view was that of reaction mechanisms and physical chemistry as it treated the major phenomena of interest to the organic chemist or the dye-works chemist dealing with these compounds. Important aspects of the dyeing process received their share of attention.

About three-quarters of the content of the original book has been transferred, with modifications to keep it up-to-date and with translation, to form the main substance of "Azo and Diazo Chemistry." Those chapters devoted to technical aspects of azo dyes and dyeing were not carried over. In the new book their place, so to speak, is taken by several chapters or sections on *aliphatic* azo compounds which, altogether, comprise about a quarter of the work.

The new book is about 30% longer than its predecessor.

Professor Zollinger writes of aromatic diazonium and azo chemistry with the confidence and command that one would expect from the world's leading investigator in that area. Though respectful of the worthwhile contributions of earlier decades, he discards much of the older systematization and nomenclature in favor of a presentation organized largely according to the precepts of modern physical organic chemistry. His lucid presentation clears away the clutter of outmoded views which had made the area of pure chemistry to which azo dye technology is related as unfashionable as Whist. The many fascinating phenomena and challenging problems which Zollinger has revealed offer a stirring opportunity to the investigator willing to suffer the slights

of the style-conscious for the rewards of discovery in an exciting but neglected field.

In presenting aliphatic azo chemistry, Zollinger is more the competent critic than the practicing master. Nevertheless, what he writes is authoritative and valuable.

It is inevitable that any general treatment of a fast-moving field should be partially out of date on the day of publication. The absence of Schmitz' work on cyclo-diazomethane and of Huisgen's interpretation of the cyclo-addition of diazomethane to olefinic bonds (as a concerted 1,3-dipolar addition) are cases in point.

The translation from German into English seems faithful. Indeed, it is occasionally too much so. Traces of German word order or idiom now and then show through.

The book is beautifully printed and produced, and errors are not obvious. However, the reviewer got a bit of peevish satisfaction out of seeing (p. 409) Burnett misspelled "Bunnet" for a change.

METCALF CHEMICAL LABORATORIES
BROWN UNIVERSITY
PROVIDENCE 12, RHODE ISLAND

JOSEPH F. BUNNETT

Industrial Organic Nitrogen Compounds, ACS Monograph No. 150. By MELVIN J. ASTLE, Professor of Organic Chemistry, Case Institute of Technology, Cleveland, Ohio. Reinhold Publishing Corporation, 430 Park Avenue, New York 22, N. Y. 1961. vii + 392 pp. 16 \times 23.5 cm. Price, \$14.00.

"This book has been written in an attempt to summarize the chemistry of most of the types of organic nitrogen compounds. No single book has appeared in recent years which has accomplished this goal. Many very excellent treatises are available describing the chemistry of amino acids and proteins, alkaloids and heterocyclic nitrogen compounds. Accordingly these compounds are not discussed extensively in this monograph. In order to present a comprehensive survey of nitrogen chemistry it has been necessary to discuss the simple heterocyclic nitrogen ring systems in some detail.

"Considerable attention has been given to the patent literature in order to present developments from the indus-