N. N. Mel'nikov, E. G. Novikov, and B. A. Kaskin*

THE CHEMISTRY AND BIOLOGICAL ACTIVITY OF DIPYRIDYLS AND THEIR DERIVATIVES*

Reviewed by O. S. Otroshchenko

This book contains material on the chemistry and biochemistry of dipyridyls and their derivatives, which are widely used as herbicides, defoliants, desiccants, analytical reagents, etc. (the bibliography includes 899 citations). Natural sources and synthetic methods for the preparation of dipyridyls are described, their physicochemical characteristics are presented, and the chemical properties of dipyridyls and dipyridilium herbicides are described.

However, one should note that much of the published data is not presented by the authors. The large series of investigations carried out at Tashkent State University involving the study of the electron fine structure and reactivities of dipyridyls and their derivatives is not reviewed, and data obtained from a study of the mechanism of the dimerization condensation of pyridine — one of the most important methods for the preparation of dipyridyls — are not presented.

The literature on dypyridylium herbicides is elucidated most completely. Methods for the preparation of quaternary salts, their chemical properties, salts, the range of application of dipyridyl derivatives, their biological activity, and, in particular, herbicides based on them are described. The section in which the physical constants of dipyridyls and their derivatives are given is of definite value. The data on diquinolyls and their derivatives, which are not directly related to the theme of the book, are superfluously included in this section.

On the whole, the material included in the book may serve as a starting point and source of information for research by chemists, synthesists, and analytical chemists, particularly specialists in biological and agricultural sectors.

*Khimiya, 1975.

A. I. Meyers

HETEROCYCLES IN ORGANIC SYNTHESIS*

Reviewed by A. N. Kost

This book by A. I. Meyers, a prominent American chemist, is original in content. The author set out to show the possibility of the use of accessible heterocyclic compounds as specific reagents or intermediates in the specific synthesis of various groupings and classes of organic substances. He describes cases of sterospecific syntheses of alcohols, carboxylic acids and oxo compounds from dihydro-1,3-oxazines or 1,3-oxazolines, accomplished by the author himself and co-workers, methods for the building of a carbon chain onto one or several carbon atoms by dethienation of the corresponding sulfur compounds (the well-known research by Ya. L. Gol'dfarb on the synthesis of macrocycles by desulfuration of the appropriate compounds with inserted thiophene fragments serves as an example of syntheses of this sort). The properties of pyrylium salts were used for the specific synthesis of polysubstituted benzenes by hydrolytic ring opening with subsequent recyclization in which the 2-methyl group participates. Numerous transformations based on dehydrobenzene and its analogs also proceed

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through the initial formation of bridged heterocycles, which are readily aromatized to give condensed aromatic systems of the carbocyclic or heterocyclic series.

Of the well-known examples of the use of heterocycles in the organic synthesis of important organic substances, the author examines the synthesis of cyclopropanes from pyrazolines by the Kizhner method, diene synthesis on the basis of pyrones, the stereospecific synthesis of glycols through epoxides, etc. However, numerous examples that are very seldom known even by specialists in the chemistry of heterocyclic compounds, even though they are of preparative value, are also included in the book — for example, the photochemical reaction of epoxy compounds with olefins to give cyclopropanes, the preparation of acetylenic acids by oxidative destruction of pyrazolones, the elimination of a phenolic hydroxyl group by means of 1-phenyl-5-chlorotetrazole, or the photochemical hydroxylation of the benzene ring by means of N-oxides. We note that a large number of the references to the original studies pertain to the last two decades, and the reader will consequently find here the modern organic chemical literature; however, the selection of the material included is somewhat arbitrary, inasmuch as some methods that are even widely used (for example, acetone protection in the oxidation of carbohydrates) are not included.

*J. Wiley, 1974.

A. M. Syrkin, D. L. Rakhmankulov, E. A. Kantor,

U. B. Imashev, and S. S. Zlot-skii

THE PHYSICAL CHEMICAL CONSTANTS OF 1,3-DIOXANES.

PART II*.

As a continuation of the previously issued handbook [see Khimiya Geterotsiklicheskikh Soedinenii, No. 6, p. 861 (1975) for the annotation], the principal physicochemical characteristics (name, structural formula, empirical formula, molecular mass, density, refractive index, melting point, boiling point, and citation to the original publication) of 1,3-dioxanes having a functional group bonded directly to the ring or in the side chain and a benzene ring bonded to or annelated with a heterocyclic ring (i.e., benzo-1,3-dioxane are also included) are included in this book. Of the oxo compounds, only substances with one keto group in one or another position of the ring (or in the side chain) are included. Meldrum's acid and its analogs and derivatives, i.e., 4,6-dioxo-1,3-dioxane, which have specific properties but do not always have proven structures, were not included in the handbook. The book encompasses a very large volume of the original literature (564 citations) and graphically demonstrates the efficient participation of Sovient scientists in the development of this field of chemistry. Correspondingly, publications by B. A. Arbuzov, V. I. Isagulyants, M. F. Shostakovskii, A. V. Bogat-skii, M. I. Farberov, Yu. Yu. Samitov, S. A. Vartanyan, and many others, including the compilers of the handbook, are represented in the list of cited studies. Insofar as inadequacies concerned, one may note that the authors do not attempt to include any spectroscopic data whatsoever, even though such data, like chromatographic characteristics, have in our time become more important than refractive indexes.

*Ufimskii Petroleum Institute, Rotaprint, 1975.

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