

CYCLIC OLEFINS IN THE PRINS REACTION*

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The reaction of cyclohexene and cyclopentene, as well as their homologs, particularly terpenes, with formaldehyde is of great value for the synthesis of heterocyclic systems (cyclic acetals, oxabicyclic systems, etc.), as well as a number of acyclic systems of various classes (1,3-diols and their derivatives, unsaturated alcohols, chlorohydrins, etc). The presence of reactive functional groups in the molecules of these compounds makes it possible to use them as starting materials for the preparation of thiahydrindanes, oxetanes, etc. The effect of various factors on the diversity of the products of the Prins reaction and their yields is examined in detail in this book. The synthesis of many of these substances by other methods is difficult or extremely laborious. However, they are formed under mild conditions via the Prins reaction from accessible and cheap olefins from the petrochemical industries.

The author has directed a great deal of attention to the theoretical analysis of the mechanism of the Prins reaction. The reaction mechanisms proposed by various investigators, including the author, are critically examined, and particular attention is directed to the stereospecificity of the process. In particular, the stereochemistry of the formation of 1,3-dioxanes, the applied and theoretical interest in which is increasing constantly, is illuminated in detail. The effect of structural, temperature, solvate, and other factors is examined.

The fourth chapter, devoted to a study of the "reverse Prins reaction," dehydrochlorination, and dehydration of the products of the Prins reaction, is very interesting. This is one of the first correlations of this sort in the world literature, although the problem is of considerable practical and, especially, theoretical interest. The author has made a number of assumptions regarding the mechanism of the "reverse Prins reaction."

The author's critical correlation of extensive data on the Prins reaction (112 citations) aids the reader in his penetration into the fundamental aspects of this problem. It is good that the text is extensively illustrated with structural formulas and reaction schemes; this makes it possible to easily become familiar with the problems under discussion.

The incompletely distinct separation of the material into chapters and the repetitions present throughout the book should be cited as inadequacies. The cross references interfere with the coherent and logical exposition of the material. In our opinion, detailed methods for the synthesis and identification of the reaction products in books of this type are not compulsory, although there is no doubt regarding the preparative complexity of the study of the Prins reaction.

On the whole, the book seems to us an important contribution to the correlation and systemization of data on the Prins reaction and an excellent manual for organic chemists doing research in the field of fine organic synthesis and dynamic stereochemistry.

* Nauka, 1975.

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SYNTHESES OF HETEROCYCLIC COMPOUNDS.

VOLUME 10*

This book, the tenth volume in this series, contains a description of 30 methods for the preparation of various derivatives of piperidine, sym- and asym-triazines, thiophene, benzothiadiazole, imidazole, pyrazole, oxazole, indole, and other heterocycles.

As in the preceding volume, the number of both heterocyclic systems and authors who have presented material for the collection has been expanded somewhat. Thus one-third of the methods were proposed by scientists from various cities of the Soviet Union and foreign countries. After thorough verification, these methods, together with methods developed by the co-workers of the A. L. Mndzhoyan Institute of Fine Organic Chemistry of the Academy of Sciences of the Armenian SSR, were included in the present collection.

In their selection of methods for completion of this volume, the editorial board was guided by the originality of the synthetic method, the accessibility of the starting materials, and the possibility of extensive application of the products for research and for the manufacture of chemical reagents. In the chapter entitled "Other preparative methods" the literature up to 1971 inclusively was used.

* Izd Akad. Nauk ArmSSR, Erevan, 1975.

Reviewed by É. A. Markaryan.

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