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Book Review

Molecular Design of Tautomeric Compounds, V.I. Minkin, L.P. Olekhnovich and Yu.A. Zhdanov, D. Reidel Publishing Company, 1988, x + 280 pages. DFl 200, $ 98.50, £ 69. ISBN 90-277-2478-4.

The first edition of this book appeared in 1977 from the Publishing House of Rostov University. However, it is clear that the present work has been very extensively revised, and takes account of the literature published up to the middle of 1986. In view of the fact that it has had to be translated, and is also typeset, the publishers should be congratulated on their despatch in getting it into print in January 1988.

The first chapter of this book is devoted to the definition of tautomerism in a general sense, to methods of study of tautomeric equilibria, and to the classification of various types of tautomerism. One tends to think first and often only of prototropic shifts in this context, but there are many other examples, particularly involving shifts of metal atoms and valence isomerism. The second chapter is devoted to an area which is clearly close to the authors' own research work, than of carbonotropy. Particular attention is paid to tautomerisations which involve the making and breaking of bonds between the migrating carbon group and nucleophilic centres in the rest of the molecule. These processes model bimolecular nucleophilic substitution at sp^2 and sp^3 carbon atoms, and transfers of acyl groups receive particularly close scrutiny. The second type of reaction involves electrophilic substitution at the carbon atom of the migrating group.

Chapter 3 moves on to discuss general principles of the design of tautomeric systems, and Chapter 4 focusses on the mechanisms of nucleophilic substitution at the main group elements and the design of intramolecular tautomeric systems. These are both interesting and contain much valuable material but I was left with the impression that they were much more concerned with rationalisation, than with *ab initio* design. Thus far the book has dealt essentially exclusively with reactions in which one sigma bond migrates between two reaction centres. Chapter 5 reviews dyotropic and polytropic systems in which simultaneous or consecutive migrations of two or more sigma bonds takes place. These processes are relatively uncommon and require careful theoretical consideration. The final chapter of the volume discusses photochemical and dissociative mechanisms for tautomerisation. The most familiar reaction to most readers will be the interconversion of norbornadiene and quadricyclane, which has potential as a solar energy storage system.

Many books which appear after translation into English read rather oddly, and the process is slow enough to make them appear a little dated by the time they reach the bookshelves. This volume is a happy exception to this rule. Not only has it been well translated, but the job has been done quickly. The book is well produced, and the diagrams, although rather variable in style, are in general clear. Some corners have clearly been cut in proof reading and I noted quite a large number of typographic errors as well as some omissions in the diagrams. The index is poor; I chose six topics or molecules, all of which were discussed in some detail in the text, and found only one of them in the index. This book brings together a wide range of information from several areas of organic and organometallic chemistry, and does so in an unusual way, which readers will find stimulating. Whilst I would personally have preferred a more straightforward factual account of some areas, with less emphasis on design, I can warmly recommend this volume. Whilst it is a little expensive for personal purchase it should be available in all chemistry libraries.

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