

## Book Reviews

**Applications of Mass Spectrometry to Organic Stereochemistry.** By J. S. Splitter and F. Turecek. VCH: Weinheim, 1994, 705 pp., hardback DM 198. ISBN 3-527-26525-2.

This volume describes the utility of mass spectrometry in determining organic stereochemistry and is part of a series devoted to methods in stereochemical analysis. It contains twenty-two chapters and the Editors have assembled a group of knowledgeable contributors who are active in the use of mass spectral techniques for the characterization of stereoisomers and conformers of a wide range of organic molecules. In addition techniques for the study of gas-phase conformational equilibria in conformationally mobile systems are discussed. Comprehensive reviews are provided of the various topics covered, together with, in many cases, new results from the authors' own laboratory.

The early chapters provide an introduction to the mass spectrometric techniques used and a discussion of conformational equilibrium and intramolecular hydrogen bonding in neutral molecules. This is followed by chapters where electron, photon and field ionization have been used for the differentiation of small acyclic and cyclic stereoisomeric molecules. Some chapters provide a broad coverage whilst others address specific classes of compounds eg cyclobutenes, tetralins and indans are covered in one chapter and heterocyclic systems are covered in another. In the third section, positive and negative ion chemical ionization of stereoisomers is discussed and this is followed by a chapter on studies of ion-molecule reactions of stereoisomers using ion cyclotron resonance spectrometry. In the later chapters, studies of larger stereoisomeric molecules, terpenes, steroids, quinolizidine and indole alkaloids and rotenoids are described. The techniques described earlier in the book are shown to be particularly useful for configurational assignments of steroid stereoisomers. The final chapter is directed to studies of stereoisomeric organometallic compounds. Appendices are provided describing the use of labelled compounds and estimation of heats of formation.

The book is very comprehensive in its coverage and is an excellent source of reference. Whilst clearly aimed at researchers in the area, it will also provide organic chemists with an insight into the way that modern mass spectral techniques

can be utilized for the provision of stereochemical information. This can be important when nuclear magnetic resonance (NMR) fails to provide unequivocal data or the amount of sample available for measurement is insufficient for NMR. The book would have been improved, from the point of view of the organic chemist, if a chapter comparing mass spectral methods with NMR and other techniques had been included. It is also a pity that the use of chromatographic separation combined with mass spectrometry for the characterization of stereoisomers was not addressed, since this approach has considerable potential for the characterization of components in synthetic mixtures and in extracts of plants and fermentation broths.

It is to be hoped that organic chemists will read this book since it contains excellent examples of areas where mass spectrometry can solve or assist in solving problems which are difficult to solve by other methods. Whilst for the more sophisticated experiments, specialist instrumentation is required, with the advent of cheaper tandem mass spectrometers ie triple quadrupoles and recent developments in ion trap mass spectrometers, information can be obtained from instruments used for routine mass spectral measurements.

**D. E. Games**, University of Wales Swansea, Wales.