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Book Review

Interpreting Organic Spectra

D. Whittaker; Royal Society of Chemistry, Cambridge, 2000, vii + 262 pages, ISBN 0-85404-601-1, £22-50

Spectroscopic data provides a great deal of useful information about organic molecules. Therefore, competent derivation of structural information from such data is a requisite skill for many individuals studying or working in areas of organic chemistry. This volume covers the basic principles of spectroscopy in as non-mathematical a way as possible. It assumes no previous knowledge of spectroscopy and avoids excessive theory, the main focus of the book being the provision of a variety of spectra for the reader to interpret. Techniques learned during interpretation of the simpler spectra can then be utilised to tackle more complex examples.

'Interpreting Organic Spectra' is divided into 14 chapters and begins by covering IR spectroscopy, which is the best means of identifying functional groups in a molecule. After a concise introduction to IR spectroscopy, the reader is presented with 20 infrared spectra to interpret (i.e. to identify common functional groups). The second chapter covers mass spectrometry, and includes 20 mass spectra for interpretation and identification of sample structure. Here the reader is shown how to determine molecular weight, halogen content and structural features of a molecule. These two chapters then lead into the third chapter, which provides the reader with IR and mass spectra for 10 unknowns. The fourth and fifth chapters cover UV and ^{13}C NMR spectroscopy, respectively. Eight UV spectra are provided for the reader to calculate peak ε_{max} values, and hence determine the transition taking place ($\pi \rightarrow \pi^*$ or $n \rightarrow \pi^*$). The decoupled and DEPT ^{13}C NMR spectra and the molecular formula are provided for identifying 10 samples. The next two chapters combine IR and mass spectra with ^{13}C NMR spectra, respectively, each containing 10 unknowns for identification. The eighth chapter brings together all techniques discussed so far, providing spectra for identification of 20 unknowns. The next chapter introduces ^{1}H NMR spectroscopy, and provides the spectra/molecular formula for 10 unknowns. Chapters 10 and 11 combine IR and mass spectra with ^{1}H NMR spectra, respectively, and each contains 10 unknowns for identification. The penultimate chapter combines all presented techniques, and another 20 unknowns for identification. The final chapter presents spectra for 10 unknowns that are more difficult to interpret.

This volume, like many others, has its origin in a course given by the author, and aims to show how each technique discussed has a particular speciality, and that these need to be combined to identify an unknown structure. It introduces spectroscopy to students and individuals who have little or no spectroscopic experience. However, it is also a useful reference tool for lecturers and more experienced analytical scientists.

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