

Book review

Stereochemical Analysis of Alicyclic Compounds by ^{13}C NMR Spectroscopy by J.K. Whitesell and M.A. Morton, Chapman and Hall, London, 1987, £25.00.

The power of carbon-13 NMR spectroscopy has lain in the information that is available from each carbon nucleus within a molecule. This is in contrast to proton NMR spectroscopy, in which until the advent of high-field spectrometers it was rarely possible to identify the signals from every proton in a molecule. Thus although the stereochemical analysis of a structure using proton NMR spectroscopy is very well-developed, it utilizes a different strategy from that based on carbon spectroscopy. The utilization of carbon chemical shift information for stereochemical analysis forms the subject of this book. This strategy depends on the additivity of substituent effects as identifiable components of the chemical shift. There is a stereochemical dependence of these effects. The first chapter discusses the basic effects of substituents in the α , β and γ positions on a carbon resonance. In the second chapter the authors consider these effects within a cyclic system before in the third chapter, introducing the stereochemical effects such as the γ gauche, γ eclipsed and δ effects. The fourth chapter examines the additivity of effects arising from multiple substituents. The success of many of these analyses depends on choosing the best model. The bulk of the book, chapters 5–18, comprises an extensive chemical shift data base for stereochemical correlations. The authors claim that the tables have been checked and in a number of cases the spectral information has been reassigned so that the data for a particular ring system is self-consistent. The book provides a useful compilation of carbon-13 data that is not readily available elsewhere. It will clearly provide models for more complex structural problems. Although this book does not deal directly with organometallic compounds, many organometallic synthetic methods have stereochemical consequences which require elucidation. Carbon-13 NMR spectroscopy clearly has a role to play in these studies. Furthermore the correlations developed in the alicyclic series will no doubt in due course have their parallel in the analysis of the spectra of cyclic organometallic derivatives. The book is well produced and clearly set out. It will provide a useful library volume for any department in which carbon-13 NMR spectroscopy plays an important role.

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