

## Book Reviews

**Chemistry of Fragrant Substances** by P. J. Teisseire. VCH: Weinheim, 1994, 458 pp., hardback DM 218, £ 89. ISBN 1-56081-610-4.

Fragrance creation is a curious blend of sensory artistry and practical chemistry delivered at an acceptable price. The "high art" is the classic perfumes, some of which have been sold continuously for more than half a century. However it is more technically demanding to create a mass market fragrance which can survive in an aggressive environment, such as a toilet cleaner. In either case price is crucial and it is said that although most people smell through their noses, perfumers smell through their wallets.

Classical chemistry based on purification, distillation and crystallisation is insufficient to analyse complex mixtures from nature in which the most desirable odour is only present at the ppb level. Some thirty years ago gas chromatography (latterly GC-MS) transformed fragrance chemistry from a largely empirical subject into a science and enabled the analysis of chemical signals between organisms such as pheromones. So with the work of literally a generation of chemists on fragrant materials, based on sound chemical analysis, the time is ripe for a book which summarises the achievements. Teisseire writes from the perspective of a synthetic organic chemist with many years experience in perfumery.

As might be expected the majority of the book is concerned with the synthesis and biosynthesis of terpenes with the emphasis on practical methods. These are illustrated by over 1400 schemes and formulae. Many of these have a bizarre typographic error in which the "second" bond of a double bond is twice as long as it should be and looks like an errant methyl group. The mechanisms in many cases can only be described as naive or just simply wrong. For example in the discussion of the Wittig reaction, the preparation of the betaine derived from benzaldehyde and methylene phosphorane is described. It is noted when benzophenone is added, no cross-over product (1,1-diphenylethene) is formed and this is given as evidence for the non-reversibility of betaine formation. However this is hardly surprising since ketones are hundreds of times less reactive than aldehydes in the Wittig reaction. Simple errors such as cetyl for ketyl are perhaps understandable in a translated work, but even the authors name is misspelt in the Library of Congress Catalogue entry. It is quite clear that this book was not read, after it was typeset. Perhaps it can be explained by a memorable error on p364; malice (acid).

The main text is followed by six appendices. Four of these are quite straightforward covering prochirality, the Wittig reaction, enol ethers and functionalisation of unactivated centres. The last two are entitled "Methods for Identifying Natural and Synthetic Organic Compounds" and "Summary of Some Physico-Chemical (sic) Methods Used in the Analysis of Natural Odourant Products". The first of these is surprisingly a discussion of the differentiation of natural and synthetic materials

by their isotope ratios using mass spectrometry and very briefly deuterium NMR. The second deals with HPLC, GC GC-MS, IR and yet more about isotope ratio measurements. There is not a word about NMR, presumably because of the author's view that "Infrared spectroscopy remains the criterion of choice for identifying known organic compounds". This book is a useful compilation for the expert but it has too many traps for the novice.

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