Preface

The recognition of differences in the pharmacological activity of enantiomeric molecules has created the need to administer them as an isolated enantiomer. However, this problem of producing enantiopure products affects not only the pharmaceutical industry but other industrial sectors such as agrochemicals, food, petroleum and also biotechnology, all of which are increasingly concerned with developing techniques to produce the pure enantiomeric product. The majority of the chiral products are sold as racemates or mixtures. Today, with impending regulations on the production and use of chiral drugs, the need to monitor production, report the isomeric composition of products and study the pharmacological effects of drugs has resulted in more than 70% of the chiral chromatography market being accounted for by the pharmaceutical industry, with emphasis on both analytical- and preparative-scale processes.

The first commercially available stationary phase for chiral HPLC was introduced in 1981 and the continuous development of technology has resulted in several stationary phases being applied successfully in analytical and preparative separations of chiral molecules. The versatility of chiral stationary phases and their effective application in both analytical- and large-scale enantiopurification have been discussed in earlier books, *A Practical Approach to Chiral Separation by Liquid Chromatography* (ed. G. Subramanian, VCH, Weinheim, 1994) and *Chiral Separation Techniques: a Practical Approach* (ed. G. Subramanian, Wiley-VCH, Weinheim, 2001). The present book aims to bring to the forefront current developments in and successful application of chiral separation techniques, providing an insight for chemists, biochemists and chemical engineers, allowing a choice of methodology in the production of enantiopure substances of quality. For comprehensive overviews, the reader is referred to specialized review articles.

I am indebted to thirty-four authors and co-authors from laboratories from all over the world who have agreed to share their experience and knowledge.

Each chapter represents an overview of its chosen topic. Chapter 1 provides an overview of Method Development and Optimization of Enantioseparations Using Macrocyclic Glycopeptide Chiral Stationary Phases, while Chapter 2 provides an account of Role of Polysaccharides in Liquid Chromatography and Capillary Electrophoresis and Chapter 3 details the Analytical and Preparative Potential of Immobilized Polysaccharide-derived Chiral Stationary Phases. Chapter 4 gives an account of Supercritical Fluid Chromatography in Chiral Separations
while Ligand Exchanges in Chiral Separation are detailed in Chapter 5. SMB Technology and Its Application are discussed in Chapters 6 and 7. Chiral Crown Ethers are detailed in Chapter 8 and Chapter 9 surveys the separation of Amino Acids and Hydroxy Acids. Capillary Electrophoresis is discussed in Chapter 10. Countercurrent Chromatography and Molecular Imprinting in Chiral Separations are detailed in Chapters 11 and 12. Chapter 13 gives an outline of Biosensors in Enantioselectivity and CEC and MEKC Coupled to Mass Spectrometry in the Analysis of Chiral Products are discussed in Chapters 14 and 15. Chapter 16 describes the Application of the Chiral Polarimeter in Enantioseparations. An insight into Preparative Chromatography in Drug Discovery is detailed in Chapter 17.

This book should be helpful to pharmaceutical chemists, biochemists, molecular biologists, pharmacologists and scientists in the agrochemical, food and biotechnology fields.

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