

Preface

What drives a scientist to edit a book on a specific scientific subject such as chiral mechanisms in separation methods? Until December 2005, the journal *Analytical Chemistry* of the American Chemical Society (Washington, DC) had an A-page section that was dedicated to simple and clear presentations of the most recent techniques or the state of the art in a particular field or topic. The “A-page” section was prepared for a broad audience of chemists including industrial professionals, students as well as academics looking for information outside their field of expertise. Daniel W. Armstrong,¹ one of the editors of this journal and a twenty-year+ long friend, invited me to present my view on chiral recognition mechanisms in a simple and clear way in an “A-page” article. In 2006, the “A-page” section was maintained as the first articles at the beginning of each first bi-monthly issue but the pagination was no longer page distinguished from the regular research articles published by the journal. During the time between the invitation and the submission, the A-page section was integrated into the rest of the journal and the article appeared as (2006) *Anal Chem* (78):2093–2099.

The article was well received. John Dorsey,² another very long time friend and colleague, invited me to present it as a lecture in his Dal-Nogare Award session of the 2008 Pittsburg Conference in New Orleans. I presented a talk focusing on the only part of chiral mechanisms that I really know and worked on: chiral recognition mechanism with the macrocyclic glycopeptide chiral selectors. Steffen Pauly, Senior Editor Chemistry for the publisher Springer, heard the talk and asked me to edit a book on the subject. It was so well paid (sigh!) that I could not refuse the offer. . . and now, you have the book in hand.

Author invitations, article redaction time, reviewing and revising process, and text editing took almost 2 years. The book opens with my own general view of chiral mechanisms in separation methods. I was very fortunate in recruiting some of the most distinguished researchers in the field. In many cases, the originators of some of these powerful separation methods agreed to contribute and provide

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their unique insight. For instance, Yoshio Okamoto, the discoverer of the powerful carbohydrate-based chiral stationary phases (CSP), and his co-workers prepared a chapter on mechanisms and applications of these CSPs. Cyclodextrins are another class of very useful CSPs. Thomas Beesley, CEO of Astec Inc, recently incorporated in the Supelco-Sigma-Aldrich group, gives his views on cyclodextrin CSPs. Daniel Armstrong introduces the macrocyclic glycopeptide CSPs. In addition, he presents here, with his group, a new class of potentially very powerful CSPs: the cyclofructan CSPs. In capillary electrophoresis (CE) the chiral selector must be added to the mobile phase since there is no real chromatographic stationary phase. Bezhan Chankvetadze of the Tbilisi State University details all possible mechanisms of chiral separations in CE. The sixth chapter written by Brian He of Bristol-Myers Squibb provides the point of view of an expert in chiral separations from the pharmaceutical industry. Next, the macrocyclic glycopeptide CSP properties and interaction mechanisms are presented by Dan Armstrong, people of his group and myself. Tim Ward of Millsaps College, Mississippi, reminds us that vancomycin, one of the macrocyclic glycopeptide selectors, has strong antibiotic properties and proposes, using vancomycin as an example, and that the antibiotic and enantioselective interactions are related. The ninth chapter, presented by Cristina Minguillon of University of Barcelona, deals with countercurrent chromatography and chiral interactions in liquid phases. Eric Peyrin of Grenoble University explains aptamers capabilities in chiral separation and the book ends with a chapter by the Isiah Warner group (Louisiana State University) on another new class of chiral selectors: the chiral ionic liquids.

In drawing this preface to a close, while all authors presented their unique point of view on chiral mechanisms in enantiomeric separations, they would like to impress upon the readers that we are still a very long way from full understanding of the enantiomer–chiral selector interactions leading to chiral separation. For instance, solvents are used. Solvent effects are very important and yet very difficult to predict accurately. The different author approaches should give an idea to the reader on the complexity of the chiral separation problem.

I want to acknowledge and to thank all the authors for the hard work and amount of effort and information that they put in their chapters. We all sincerely wish that this book will be useful to beginners and students as well as to confirmed practitioners in this unique separation field.

Villeurbanne, France
May 20, 2010

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<http://www.springer.com/978-3-642-12444-0>

Chiral Recognition in Separation Methods
Mechanisms and Applications

Berthod, A. (Ed.)

2010, XIV, 337 p., Hardcover

ISBN: 978-3-642-12444-0