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YAZMIN VANESSA

Thin Layer Chromatography in Chiral Separations and Analysis MDPI

Unique in its systematic and detailed description of the various types, structures, and properties of chiral stationary phases (CSPs) and their preparation, application, and future scope, this volume highlights an assortment of liquid chromatographic approaches, including sub- and super-critical fluid chromatography, capillary electrochromatography

Chiral Liquid Chromatography American Chemical Society Publ

The development of chiral liquid chromatography, facilitating the straightforward separation of enantiomers, was a significant advance in chromatography, leading to widespread application in analytical chemistry. Application in preparative chromatography has been less rapid, but with the development of single enantiomer pharmaceuticals its use is increasingly common in chemical synthesis at laboratory, pilot plant and even full production scale. Brings non-experts up to speed quickly and comprehensively, facilitating the rapid development of effective separations of enantiomeric mixtures on a range of process scales. Presents case studies drawn from within the pharmaceutical industry to clearly illustrate the utility and value of preparative scale enantioselective chromatography in chemical research, development and production. Key reference source and entry to the literature so the reader does not have to engage in expensive and time consuming literature searching.

Recent Advances in Chiral Separations Wiley-VCH

Both analytical and preparative-scale enantioseparation techniques are covered in a down-to-earth practical way. The most important aspects of design, economics and safety are considered with emphasis on current European and North American legislation. In addition, the theory of chiral separation is covered in sufficient detail to guide the practising chromatographer interested in developing new techniques. A team of experts from academic and industrial laboratories throughout the world have compiled their findings and experience to make this book an exceptionally timely and unique contribution to the field.

Chiral Separation Springer Science & Business Media

Learn to maximize the performance of your HPLC or UHPLC system with this resource from leading experts in the field. Optimization in HPLC: Concepts and Strategies delivers tried-and-tested strategies for optimizing the performance of HPLC and UHPLC systems for a wide variety of analytical tasks. The book explains how to optimize the different HPLC operation modes for a range of analyses, including small molecules, chiral substances, and biomolecules. It also shows readers when and how computational tools may be used to optimize performance. The practice-oriented text describes common challenges faced by users and developers of HPLC and UHPLC systems, as well as how those challenges can be overcome. Written for first-time and experienced users of HPLC technology and keeping pace with recent developments in HPLC instrumentation and operation modes, this comprehensive guide leaves few questions unanswered. Readers will also benefit from the inclusion of: A thorough introduction to optimization strategies for different modes and uses of HPLC, including working under regulatory constraints. An exploration of computer aided HPLC optimization, including ChromSword Auto and Fusion QbD. A treatment of current challenges for HPLC users in industry as well as large and small analytical service providers. Discussions of current challenges for HPLC equipment suppliers. Tailor-made for analytical chemists, chromatographers, pharmacologists, toxicologists, and lab technicians. Optimization in HPLC: Concepts and Strategies will also earn a place on the shelves of analytical laboratories in academia and industry who seek a one-stop reference for optimizing the performance of HPLC systems.

New Bio-analytical Separations Utilizing Chiral Mobile Phase Additives in Thin Layer Chromatography and Chiral Stationary Phases in High Performance Liquid Chromatography Springer Science & Business Media

Modified Cyclodextrins for Chiral Separation offers a review of the latest advances in developing modified cyclodextrins as chiral selectors for various chromatographic and electromigration techniques. Over the years, many descriptions of chiral separation have appeared in academic journals and books, but most of them have been devoted to either the development of analytical methods and protocols or the summary of different chiral selectors, including cyclodextrins for chiral separation applications. This is in marked contrast to this volume which focuses on the research endeavors concerning the development of cyclodextrin derivatives specifically as either chiral mobile phases for capillary electrophoresis, or chiral stationary phases for various chromatographic techniques including gas chromatography, or high-performance liquid chromatography and supercritical fluid chromatography. The ongoing thread in this book is the synthesis of structurally-defined cyclodextrin derivatives and their applications in enantiomer separation by means of different analytical techniques. Modified Cyclodextrins for Chiral Separation is intended for those who are interested in expanding their knowledge of cyclodextrin chemistry and chiral separation, and in what cyclodextrin modification can be made to suit the needs of chiral selectors for different analytical techniques. It primarily focuses on the state-of-the-art cyclodextrin chemistry which is the basis for all chiral selectors used in these chiral separation techniques. Weihua Tang, PhD, is a professor at the Key Laboratory of Soft Chemistry and Functional Materials, Ministry of Education, Nanjing University of Science and Technology, China. Siu-Choon Ng, PhD, is a professor at the Division of Chemical and Biomedical Engineering, School of Chemical and Biomedical Engineering, Nanyang Technological University, Singapore. Dongping Sun, PhD, is a professor at the Key Laboratory of Soft Chemistry and Functional Materials, Ministry of Education, Nanjing University of Science and Technology, China.

Chiral Separation of Pharmaceutical Compounds by High Performance Liquid Chromatography CRC Press

"The problem addressed by this dissertation is the separation of optical isomers in commercial as well as biological samples. The chromatographic separation of enantiomers is an important and rapidly developing field of study. Chiral separations of pharmaceutical compounds and important organic intermediates in high performance liquid chromatography (HPLC) and thin layer chromatography (TLC) were achieved. Two methods were employed for the direct liquid chromatographic resolution of chiral analytes: chiral stationary phases (CSPs) and chiral mobile

phase additives (CMAs). Native and derivatized [beta]-cyclodextrins ([beta]-CD) were used as chiral stationary phases in reverse phase and normal phase HPLC, respectively. This study marked the first use of derivatized [beta]-CDs for chiral separations in normal phase media. N-carbobenzoxy-glycyl-L-proline and (1R)-(-)-ammonium-10-camphorsulfonate were utilized as CMAs in normal phase TLC for the resolution of several aromatic amino alcohols. Maltosyl-[beta]-CD and hydroxypropyl-[beta]-CD were employed as CMAs in reverse phase TLC. A study was conducted with hydroxypropyl-[beta]-CD to determine how the degree of substitution of a derivatized CD could effect development time, the viscosity of the solution and the enantioselectivity. In addition, studies were initiated to determine the presence of trace levels of D-amino acids in: amniotic fluid, blood serum and urine. The blood and urine of healthy young adults were analyzed and found to contain trace to percent levels of D-amino acids. The human amniotic fluid samples did not have detectable levels of D-amino acids"-- Abstract, page iv.

Concepts and Strategies Springer Science & Business Media

Discusses chiral separations and offers guidance for selecting the optimum method for desired results. Chiral separations represent the most intriguing and, by some measures, most difficult separations of chemical compounds. This book provides researchers and students an understanding of chiral separations and offers a convenient route to selecting the best separation method, saving considerable time and cost in product development. Considering chiral separations in the biotechnological and pharmaceutical industries, as well as for food applications, Dr. Ahuja provides insights into a broad range of topics. Opening with a broad overview of chiral separations, regulatory considerations in drug product development, and basic issues in method development, the book: Covers a variety of modern methods such as gas chromatography, high performance liquid chromatography, supercritical fluid chromatography, and capillary electrophoresis. Deals with the impact of chirality on the biological activity of small and large molecules. Provides detailed information on useful chiral stationary phases (CSPs) for HPLC. Includes handy information on selection of an appropriate CSP, including mechanistic studies. Offers strategies for fast method development with HPLC, SFC, and CE. Discusses preparatory methods utilized in the pharmaceutical industry. With in-depth discussions of the current state of the field as well as suggestions to assist future developments, Chiral Separation Methods for Pharmaceutical and Biotechnological Products is an essential text for laboratory investigators, managers, and regulators who are involved in chiral separations in the pharmaceutical industry, as well as students preparing for careers in these fields.

Chiral Analysis CRC Press

Though many separation processes are available for use in today's analytical laboratory, chromatographic methods are the most widely used. The applications of chromatography have grown explosively in the last four decades, owing to the development of new techniques and to the expanding need of scientists for better methods of separating complex mixtures. With its comprehensive, unified approach, this book will greatly assist the novice in need of a reference to chromatographic techniques, as well as the specialist suddenly faced with the need to switch from one technique to another.

Design of Chiral Separations by Liquid Chromatography and Capillary Electrophoresis for Amlodipine and Derivatives Springer Science & Business Media

This is a completely revised and updated sequel to 'A Practical Approach to Chiral Separations by Liquid Chromatography' by the same editor. The scope has been extended to further chiral separation techniques like electrophoresis, membrane separations, or biological assays. More emphasis is put on preparative separation techniques. From reviews of the previous edition: 'A team of experts from academic and industrial laboratories throughout the world have compiled their findings and experience to make this book an exceptionally timely and unique contribution to the field' European Journal of Drug Metabolism 'The dense mass of information contained in this book will make it a valuable resource ...' Chemical Engineering Research '... this is a worthwhile addition to the expanding chiral literature and the book should be of value to those working in this field' The Analyst

A Practical Approach to Chiral Separations by Liquid Chromatography John Wiley & Sons

In its systematic description of the types, structures and properties of chiral stationary phases (CSPs) and their preparation, application and future scope, this volume highlights an assortment of liquid chromatographic, including sub- and super-critical fluid chromatography.

Chiral Separations Chiral Separations By Liquid Chromatography And Related Technologies

A definitive reference for researchers working on problems involving chirality. Presenting state-of-the-art information, this volume covers all the major modes of separation and offers contributions from the leading researchers who developed these techniques. Four chapters provide a detailed review of the commonly used columns: brush type, cyclodextrin, polysaccharide carbonate, and protein. Many of the papers focus on HPLC, a technique which is also ideally suited for large scale preparation of optical isomers. In addition, the volume provides significant discussion on the use of chiral discriminators or selectors.

Chiral Separations Using Bile Salt Solutions in High Performance Liquid Chromatography and Micellar Electrokinetic Capillary Chromatography Wiley-VCH

Enantiomeric separations are an essential component of pharmaceutical drug development, not only at the analytical scale, but also to separate usable quantities for further analysis. The field of asymmetric synthesis is also heavily dependent on chromatographic methods to separate and quantify the results of asymmetric transformations as well as characterize new ligands and catalysts. This dissertation focuses on the use of macrocyclic chiral stationary phases for use in high performance liquid chromatography as well as subcritical fluid chromatography to separate individual enantiomers of molecules of importance to the scientific community. Optimized separation conditions are provided for many of these important analytes, which will expedite the evaluation of their usefulness in a variety of applications. Particular emphasis is put on elucidating the mechanism of interaction between analyte and stationary phase. In chapters two and three, principle component analysis is applied to the chromatographic data to gain better understanding of the factors contributing to retention and enantioselectivity. It was shown that optimized separation conditions are also provided for newly synthesized isochromene and Tröger base derivatives using cyclodextrin and cyclofructan based chiral stationary phases. The fourth chapter provides separation

conditions for a variety of novel synthetic biaryl atropisomers, which have the potential to serve as useful ligands in asymmetric transformations as well as possessing antibiotic/antimicrobial properties. Preparative scale separation conditions are also provided allowing for these important analytes to be prepared and evaluated in their enantiomerically pure form. Insight into the mechanism of analyte retention is provided indicating that dipolarity/polarizability is the primary retentive interaction between substituted biaryls and derivatized cyclodextrans. Chapter five provided a valuable comparison of commonly used chromatographic conditions for the separation of primary amines using cyclodextran based chiral stationary phases. The effect of various additives and polar modifiers was investigated and the results indicate that a combination of acidic and basic additives is necessary to obtain optimal separations. The advantages of individual chromatographic modes are also provided. Normal phase separations provided the greatest selectivities at the cost of longer analysis times while modified carbon dioxide mobile phases provided excellent peak profiles and short analysis times. Preparative scale separations are also provided using modified carbon dioxide mobile phases allowing for enantiopure compounds to be prepared in an environmentally friendly manner without the use of petroleum based solvents.

Modified Cyclodextrins for Chiral Separation Elsevier Inc. Chapters

Biological in vivo processes are stereochemically controlled and rate limited by proper selection of enantiomers. Wrong selection can have deleterious effects, therefore, more than 40% of drugs (over the retail counters and prescribed) are indeed chiral, and of these 25% are supplied as pure enantiomers. So chiral separation has remained interesting and still challenging task for oneself to develop the new, simple, reproducible and sensitive methods. This book focuses on the chiral separation of some important pharmaceuticals using two major approaches; one is pre-column derivatization with a chiral reagent followed by separation of resulting diastereomers known as 'indirect approach'. The other one is 'direct approach' which may use a chiral mobile phase additive (CMPA) or a chiral stationary phase (CSP) or the chiral selector is immobilized/ impregnated with the stationary phase.

[Investigation of Achiral/Chiral Separations by High Performance Liquid Chromatography and Capillary Zone Electrophoresis](#) Elsevier

Abstract: Enhanced-fluidity liquids (EFLs) are a mixture of liquefied gases (typically carbon dioxide or fluoroform) and commonly-used liquids such as methanol and water. EFLs have the advantages of both supercritical fluids (low viscosity and high diffusivity) and pure liquid solvents (high solvent polarity). The high solvent polarity of EFLs enables the application of enhanced-fluidity liquid chromatography (EFLC) on a wide range of compounds. The low viscosity and high diffusivity allow higher separation efficiencies in EFLC than in high performance liquid chromatography (HPLC). In this study, EFLs were applied as mobile phases for chiral separations (under both normal- and reversed-phase modes) and nucleotides and nucleoside separations (by using a porous glassy carbon column, under reversed-phase mode). The separation results under EFLC conditions were compared with those under HPLC conditions. For chiral separations under both separation modes, higher resolution was always observed under EFLC conditions. Higher efficiency was observed under EFLC conditions with carbon dioxide in the range of 0-60 mol% in the mobile phase. For nucleotides and nucleosides separations, most of sample mixtures were better separated under EFLC conditions compared to HPLC condition.

studies of protein and cellulose based stationary phases CRC Press

Covers the Fundamentals of Chiral Separation, Available Chiral Selectors, and Numerous Applications of Chiral Separation by Capillary Electrophoresis Since the 1980s, modern analytical tools have enabled capillary electrophoresis to become a standard part of the chemist's toolkit. With contributions from international experts, *Chiral Separations by Capillary Electrophoresis* provides a general overview of the principles of chiral separation by capillary electrophoresis and the different chiral selectors available. The book discusses the most important as well as several new chiral selectors used in capillary electrophoresis. It reviews recent pharmaceutical and biomedical applications and explores novel techniques, such as capillary electrophoresis coupled to mass spectrometry and microchip technology. The book also examines the quantitative aspects of capillary electrophoresis, the possibilities of capillary electrochromatography, and the various chiral columns available. Capillary electrophoresis has proven to be an effective tool for chiral separation. This book explains how this technique can be used in the separation of molecules, offering insight into both existing and emerging applications.

Chiral Separations by Liquid Chromatography John Wiley & Sons

This volume represents the proceedings of a two-day international meeting on chiral

chromatography held at the University of Surrey between 3-4 September 1987. The meeting was jointly organized by the Chromatographic Society and the Robens Institute of the University of Surrey in response to the burgeoning interest in this rapid maturing field of chromatography. Nowhere is this interest more evident than in the agrochemical and pharmaceutical industries where the implications of different pharmacological and toxicological activity for the individual enantiomers present in a racemic drug or insecticide is an increasing area of concern. Developments in the area of chiral separations are at last beginning to provide Scientists with the necessary tools to study how animals and man handle racemates and relate their observations to the observed biological effects of these substances. The development of robust and simple methods for the separation of enantiomers will therefore have a profound impact on safety evaluation and drug design. The meeting proved to be very successful, with over 160 delegates from thirteen countries in Europe and America present to learn from the experiences of experts in the field of chiral chromatography and to hear about the latest developments. Hopefully, in future symposia on chiral separations at the University of Surrey.

[Chiral Separations By Liquid Chromatography And Related Technologies](#) CRC Press

The design of chiral separations in liquid chromatography (LC) and capillary electrophoresis (CE) involves the selection of chiral selectors and eluent parameters, often on a purely empirical basis. It would be desirable if rapid screening methods could be designed to rationalise the choice of these chiral selectors. With reference to the use of cyclodextrin (CD) derivatives as chiral selectors, nuclear magnetic resonance spectroscopy (NMR) can play an important role in screening the extent of interactions with chiral solutes, and in probing the nature of the stereoselective interactions involved. Data from high-field NMR on drugs and their derivatives have been explored for screening a number of potential chiral recognition agents, as an aid to the rational design of chiral separations by LC and CE, based on cyclodextrins (alpha, beta, gamma, hydroxypropyl-beta and hydroxyethyl-beta) bonded to silica (LC) and in free solution (CE). In this investigation high-field FT-NMR is used to examine the interaction mechanism between these cyclodextrins and the calcium channel blocker Amlodipine together with a series of its structural analogues. Enantiomeric interactions between the cyclodextrins and Amlodipine are explored using ROESY (rotating frame nuclear Overhauser effect spectroscopy) in order to determine the inclusion mechanism involved.....

Chiral Separations John Wiley & Sons

While working as a chromatographer in the pharmaceutical industry, it became apparent to the editor that there was a pressing need for a comprehensive reference text for analysts working on the resolution of enantiomers by liquid chromatography (LC). This need arises from the fact that, whereas previously it was very difficult to determine enantiomers by direct means, there is now a wide choice of direct LC methods. At the same time, regulatory authorities have been changing their attitudes towards the administration of pharmaceuticals as racemates, partly because it is now possible to study the individual enantiomers. Clearly this abundance of new information needs to be rationalized. More importantly, the chiral LC systems which are commercially available or readily accessible to the practising chromatographer needed to be reviewed and, to a much greater extent than in existing reviews or books, discussed in terms of their practical application. Accordingly this book is very much orientated towards the practical aspects of these commercially available and readily accessible chiral LC systems. To this end, it is written for practising chromatographers by a team of practising, experienced chromatographers who have spent many years tackling the problems presented by resolving enantiomers by LC. The practical aspects of common chiral LC systems cannot be fully understood if discussed in isolation.

[Chiral Separations by Liquid Chromatography](#) Wiley-VCH

This chapter summarizes major developments in the field of liquid chromatographic separation of enantiomers. After a short historical overview, the materials and technologies used for analytical and preparative scale separation of enantiomers in high-performance liquid chromatography, nano liquid chromatography, simulated moving-bed chromatography, and supercritical fluid chromatography are briefly discussed. In the final part, some future trends in liquid chromatographic separation of enantiomers are overviewed.

[A Liquid Chromatography Approach](#) Springer Science & Business Media

A large number of examples are given that will assist in the selection of a method, including thin-layer chromatography, capillary electrophoresis and membrane separations. "This book will be a reliable guide for those just starting out in pharmaceutical and related industries, as well as those with experience in the field."--Jacket.