

Preparative HPLC Troubleshooting Guide

Your guide to solving common problems and staying productive

Agilent
InfinityLab

Places to start

Errors

- Use proven installation techniques and equipment
- Use only Agilent grade reagents

Prevent and prevent re-occurrence

- Regular instrument maintenance
- Always use the best value materials package for your application
- Use the appropriate system configuration method

Early tests

- Replace reagents and replace mobile phase every second day
- Check and recalibrate
- Start the system with the composition of your application

Early tests

- Change solvent system gradually, and replace when flow
- Check system components and change them if necessary

Early detection

- Run at flow rate to remove any deposits and particles made
- Start the system with appropriate design solvent and pump flow the system

Early detection

- Remove high viscosity pH system components from system
- Plug mobile phase flow (cylinder) and use with mobile phase
- Run system with 10% organic and 10% acid or other composition to wash trapping or buffer degradation of column



Maintenance

Agilent Lab Manager software helps you manage and optimize all instruments to achieve high quality, chromatographic results. The more efficient you are using high volume performance, productivity, reliability, it is a solution for all change.

- Regular tests to ensure performance
- Clean maintenance of all types of modules
- Comparison of system performance and maintenance with system status

Flow rate



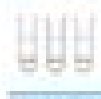
Flow rate



Flow rate



Flow rate



Flow rate



Problem	Solution
Flow rate is too low	Check flow rate and pressure. If flow rate is too low, check the pump and the column.
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Günter J. Eppert



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The HPLC Expert Stavros Kromidas, 2016-03-28 The rapid development of HPLC instrumentation and technology opens numerous possibilities and entails new questions Which column should I choose to obtain best results which gradient fits to my analytical problem what are recent and promising trends in detection techniques what is state of the art regarding LC MS coupling All these questions are answered by experts in ten self contained chapters Besides these more hardware related and technical chapters further related areas of interest are covered Comparison of recent chromatographic data systems and integration strategies smart documentation efficient information search in internet and tips for a successful FDA inspection This practical approach offers in a condensed manner recent trends and hints and will also display the advanced reader mistakes and errors he was not aware of so far *Fundamentals of Environmental Sampling and Analysis* Chunlong Zhang, 2007-03-09 An integrated approach to understanding the principles of sampling chemical analysis and instrumentation This unique reference focuses on the overall framework and why various methodologies are used in environmental sampling and analysis An understanding of the underlying theories and principles empowers environmental professionals to select and adapt the proper sampling and analytical protocols for specific contaminants as well as for specific project applications Covering both field sampling and laboratory analysis *Fundamentals of Environmental Sampling and Analysis* includes A review of the basic analytical and organic chemistry statistics hydrogeology and environmental regulations relevant to sampling and analysis An overview of the fundamentals of environmental sampling design sampling techniques and quality assurance quality control QA QC essential to acquire quality environmental data A detailed discussion of the theories of absorption spectroscopy for qualitative and quantitative environmental analysis metal analysis using various atomic absorption and emission spectrometric methods and the instrumental principles of common chromatographic and electrochemical methods An introduction to advanced analytical techniques including various hyphenated mass spectrometries and nuclear magnetic resonance spectroscopy With real life case studies that illustrate the principles plus problems and questions at the end of each chapter to solidify understanding this is a practical hands on reference for practitioners and a great textbook for upper level undergraduates and graduate students in environmental science and engineering **HPLC and UHPLC for Practicing Scientists** Michael W. Dong, 2019-07-23 A concise yet comprehensive reference guide on HPLC UHPLC that focuses on its fundamentals latest developments and best practices in the pharmaceutical and biotechnology industries Written for practitioners by an expert practitioner this new edition of HPLC and UHPLC for Practicing Scientists adds numerous updates to its coverage of high performance liquid chromatography including comprehensive information on UHPLC ultra high pressure liquid chromatography and the continuing migration of HPLC to UHPLC the modern standard platform In addition to introducing readers to HPLC s fundamentals applications and developments the book describes basic theory and terminology for the novice and reviews relevant concepts best practices

and modern trends for the experienced practitioner HPLC and UHPLC for Practicing Scientists Second Edition offers three new chapters One is a standalone chapter on UHPLC covering concepts benefits practices and potential issues Another examines liquid chromatography mass spectrometry LC MS The third reviews at the analysis of recombinant biologics particularly monoclonal antibodies mAbs used as therapeutics While all chapters are revised in the new edition five chapters are essentially rewritten HPLC columns instrumentation pharmaceutical analysis method development and regulatory aspects The book also includes problem and answer sections at the end of each chapter Overviews fundamentals of HPLC to UHPLC including theories columns and instruments with an abundance of tables figures and key references Features brand new chapters on UHPLC LC MS and analysis of recombinant biologics Presents updated information on the best practices in method development validation operation troubleshooting and maintaining regulatory compliance for both HPLC and UHPLC Contains major revisions to all chapters of the first edition and substantial rewrites of chapters on HPLC columns instrumentation pharmaceutical analysis method development and regulatory aspects Includes end of chapter quizzes as assessment and learning aids Offers a reference guide to graduate students and practicing scientists in pharmaceutical biotechnology and other industries Filled with intuitive explanations case studies and clear figures HPLC and UHPLC for Practicing Scientists Second Edition is an essential resource for practitioners of all levels who need to understand and utilize this versatile analytical technology It will be a great benefit to every busy laboratory analyst and researcher

Handbook of LC-MS Bioanalysis Wenkui Li, Jie Zhang, Francis L. S. Tse, 2013-09-03 Consolidates the information LC MS bioanalytical scientists need to analyze small molecules and macromolecules The field of bioanalysis has advanced rapidly propelled by new approaches for developing bioanalytical methods new liquid chromatographic LC techniques and new mass spectrometric MS instruments Moreover there are a host of guidelines and regulations designed to ensure the quality of bioanalytical results Presenting the best practices experimental protocols and the latest understanding of regulations this book offers a comprehensive review of LC MS bioanalysis of small molecules and macromolecules It not only addresses the needs of bioanalytical scientists working on routine projects but also explores advanced and emerging technologies such as high resolution mass spectrometry and dried blood spot microsampling Handbook of LC MS Bioanalysis features contributions from an international team of leading bioanalytical scientists Their contributions reflect a review of the latest findings practices and regulations as well as their own firsthand analytical laboratory experience The book thoroughly examines Fundamentals of LC MS bioanalysis in drug discovery drug development and therapeutic drug monitoring The current understanding of regulations governing LC MS bioanalysis Best practices and detailed technical instructions for LC MS bioanalysis method development validation and stability assessment of analytes of interest Experimental guidelines and protocols for quantitative LC MS bioanalysis of challenging molecules including pro drugs acyl glucuronides N oxides reactive compounds and photosensitive and autooxidative compounds With its focus on current bioanalytical practice

Handbook of LC MS Bioanalysis enables bioanalytical scientists to develop and validate robust LC MS assay methods all in compliance with current regulations and standards **Der HPLC-Experte** Stavros Kromidas, 2014-01-22 Der rasanten Entwicklung auf dem Gebiet der HPLC wird mit diesem Buch Rechnung getragen Von Gradientenoptimierung ber Kopplungs und 2D Techniken bis zu Dokumentation und Informationsbeschaffung aktuell und kompakt geschrieben von Praktikern f r Praktiker Inhalt 1 LC MS Kopplung 1 1 Stand der Technik in der LC MS Kopplung 1 2 Technische Aspekte und Fallstricke der LC MS Kopplung 1 3 LC MS Kopplung ein praktisches Beispiel aus der Ionenchromatographie 2 HPLC GC Kopplung in der Praxis Theorie Applikationsbeispiele und Ausblick 3 Optimierungsstrategien in der RP HPLC 4 Der Gradient in der RP Chromatographie 4 1 Aspekte der Gradienten Optimierung 4 2 Vorhersagen von Gradienten 5 Vergleich und Auswahl von modernen HPLC S ulen 6 Trenntechniken in der Biochromatographie 7 Moderne HPLC Softwareprogramme Eigenschaften Vergleich Ausblick 8 M glichkeiten der richtigen Integration heute 9 HPLC im reglementierten Bereich 9 1 Intelligente Dokumentationen 9 2 Tipps f r eine gelungene FDA Inspektion 10 Effiziente Informationsbeschaffung im Zeitalter von Web 2 0 am Beispiel der HPLC 11 Trends in der Detektionstechnik *Principles and Practice of Modern Chromatographic Methods* Kevin Robards, Danielle Ryan, 2021-12-03 Principles and Practice of Modern Chromatographic Methods Second Edition takes a comprehensive unified approach in its presentation of chromatographic techniques Like the first edition the book provides a scientifically rigid but easy to follow presentation of chromatography concepts that begins with the purpose and intent of chromatographic theory the what and why that are left out of other books attempting to cover these principles This fully revised second edition brings the content up to date covering recent developments in several new sections and an additional chapter on composite methods New topics include sample profiling sample preparation sustainable green chemistry 2D chromatography miniaturization nano LC HILIC and more Contains thorough chapters that begin with an updated schematic overview and a visual representation of the content Avoids the obfuscation of different terminologies and classification systems that are prevalent in the area such as the relationship between liquid chromatography and column chromatography Provides integrated and comprehensive topic coverage based on chromatographic bibliometrics and survey reports on the relative usage of chromatographic techniques *Instrument and Automation Engineers' Handbook* Bela G. Liptak, Kriszta Venczel, 2022-08-31 The Instrument and Automation Engineers Handbook IAEH is the Number 1 process automation handbook in the world The two volumes in this greatly expanded Fifth Edition deal with measurement devices and analyzers Volume one Measurement and Safety covers safety sensors and the detectors of physical properties while volume two Analysis and Analysis describes the measurement of such analytical properties as composition Complete with 245 alphabetized chapters and a thorough index for quick access to specific information the IAEH Fifth Edition is a must have reference for instrument and automation engineers working in the chemical oil gas pharmaceutical pollution energy plastics paper wastewater food etc industries A Practical Guide to Geometric Regulation for Distributed Parameter Systems

Eugenio Aulisa, David Gilliam, 2015-06-18 A Practical Guide to Geometric Regulation for Distributed Parameter Systems provides an introduction to geometric control design methodologies for asymptotic tracking and disturbance rejection of infinite dimensional systems The book also introduces several new control algorithms inspired by geometric invariance and asymptotic attraction for a wide range of dynamical control systems The first part of the book is devoted to regulation of linear systems beginning with the mathematical setup general theory and solution strategy for regulation problems with bounded input and output operators The book then considers the more interesting case of unbounded control and sensing Mathematically this case is more complicated and general theorems in this area have become available only recently The authors also provide a collection of interesting linear regulation examples from physics and engineering The second part focuses on regulation for nonlinear systems It begins with a discussion of theoretical results characterizing solvability of nonlinear regulator problems with bounded input and output operators The book progresses to problems for which the geometric theory based on center manifolds does not directly apply The authors show how the idea of attractive invariance can be used to solve a series of increasingly complex regulation problems The book concludes with the solutions of challenging nonlinear regulation examples from physics and engineering

Maintaining and Troubleshooting HPLC Systems Dennis J. Runser, 1981-05-06 Provides users of HPLC equipment with a comprehensive text for troubleshooting and maintaining HPLC systems Describes how the chromatographer can maintain the HPLC system in operating condition what to look for and do to prevent and solve HPLC problems and what can and should be done before calling a service representative Organized into chapters which basically represent the typical components of the HPLC system with each chapter describing a basic element of the HPLC system in terms of maintenance and solving system problems Arranged as a guide and working manual to help the chromatographer reduce instrument downtime allowing for more efficiency and cost effectiveness in the HPLC laboratory

Mass Spectrometry-Based Metabolomics Sastia Prama Putri, Eiichiro Fukusaki, 2014-11-19 Mass Spectrometry Based Metabolomics A Practical Guide is a simple step by step reference for profiling metabolites in a target organism It discusses optimization of sample preparation for urine serum blood tissue food and plant and animal cell samples Encompassing three different technical fields biology analytical chemistry and informatics mass spectrometry based metabolomics can be challenging for biologists without special training in quantitative mass spectrometry This book is designed to overcome this limitation by providing researchers with the knowledge they need to use metabolomics technology in their respective disciplines The book summarizes all steps in metabolomics research from experimental design to sample preparation analytical procedures and data analysis Case studies are presented for easy understanding of the metabolomics workflow and its practical applications in different research fields The book includes an in house library and built in software so that those new to the field can begin to analyze real data samples In addition to being an excellent introductory text the book also contains the latest advancements in this emerging field and can thus be a

useful reference for metabolomics specialists *Chromatogramme richtig integrieren und bewerten* Stavros Kromidas, Hans Joachim Kuss, 2008-05-05 Stavros Kromidas und Hans Joachim Kuss schließen mit ihrem Autorenteam aus erfahrenen Experten eine wichtige Lücke in der Analytik Literatur. Sie stellen prägnant und nachvollziehbar den Weg von den Rohdaten zum bewerteten Ergebnis vor. Das ist besonders wichtig für gesetzlich relevante Messungen z.B. in der Pharma und Nahrungsmittelanalytik, denn wer hier Fehler macht, erzeugt trotz korrekter Messdaten falsche Informationen. Und auf die gebräuchlichen Auswerteprogramme ist nicht immer Verlass.

American Laboratory, 2001 **Troubleshooting HPLC Systems** Paul C. Sadek, 2000. A complete up to date guide to the use, maintenance and troubleshooting of HPLC systems. The last twenty five years have seen a dramatic rise in the use of High Performance Liquid Chromatography (HPLC) in laboratories worldwide. Troubleshooting HPLC Systems provides analysts as well as laboratory technicians and managers with a readily accessible and immensely useful guide to the new generation of HPLC equipment and techniques. With an emphasis on effective troubleshooting of HPLC systems, this lab companion covers system configuration and functions, problem solving procedures, maintenance and HPLC basics. It then walks chromatographers investigating the source of a malfunction through each system component from solvents and reservoirs to sample preparation to columns and detectors. Special features of Troubleshooting HPLC Systems include: A detailed review of HPLC instrumentation and accessories; The role of operating parameters as indicators of system performance; Step by step troubleshooting protocols for each system component; How to set up a preventive maintenance program for HPLC systems; An overview of the categories of HPLC separations; A compilation of HPLC terms and definitions; Tables and charts detailing solvents properties.

MAINTAINING AND TROUBLESHOOTING HPLC SYSTEM : A USER'S GUIDE. Dennis J. Runser, 1981 *Troubleshooting HPLC Systems* Lloyd R. Snyder, 1986 The Troubleshooting and Maintenance Guide for Gas Chromatographers Dean Rood, 2007-09-24. This fourth edition of the classic guide for every user of gas chromatographic instrumentation is now updated to include such new topics as fast GC using narrow short columns, electronic pressure control and basic aspects of quantitative gas chromatography. The author shares his many years of experience in technical support for gas chromatography users, addressing the most common problems, questions and misconceptions in capillary gas chromatography. He structures and presents the material in a concise and practical manner suitable even for the most inexperienced user without any detailed knowledge of chemistry or chromatography. For lab technicians in chemistry, analytical food, medicinal and environmental chemists, pharmacists.

HPLC Troubleshooting Günter J. Eppert, 2003 Troubleshooting Hplc Systems Paul C. Sadek, 2002-02-01 HPLC Method Development Troubleshooting Guide Mirela Gorjanu, 2025-06-18. Struggling with peak distortion, drifting retention times or failing system suitability? You're not alone, and this guide has your back. The HPLC Method Development Troubleshooting Guide is your bench side solution to the most common and frustrating chromatographic challenges. Whether you're a new analyst or a seasoned scientist, this practical, no fluff manual gives you the clarity and confidence to fix problems.

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