

# Continuous-Flow Fast Atom Bombardment Mass Spectrometry

Edited by Richard M. Caprioli



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# Continuous Flow Fast Atom Bombardment Mass Spectrometry

**M.L Gross**



## **Continuous Flow Fast Atom Bombardment Mass Spectrometry:**

*Continuous-flow Fast Atom Bombardment Mass Spectrometry* R. M. Caprioli, 1998      **Continuous-Flow Fast Atom Bombardment Mass Spectrometry** R. M. Caprioli, 1990-12-31 Based on presentations made at a workshop on Continuous Flow Fast Atom Bombardment held in Annapolis Maryland in November 1989 Expanded and edited the papers presented at the workshop form a compact volume reflecting recent advances in a number of key areas in the field of continuous flow fast atom bombardment mass spectrometry Topics cover non aqueous applications biological process monitoring trace analysis and design and operational conditions      Continuous Flow Fast Atom Bombardment and Electrospray Ionization Mass Spectrometry in Natural Products Research Katarzyna Janota, 1995 Continuous flow fast atom bombardment CF FAB has been applied as a liquid chromatography mass spectrometry LC MS and liquid chromatography mass spectrometry mass spectrometry LC MS MS interface in natural products research Initial studies concentrated on characterization of the interface optimization of operational parameters and sensitivity assessment Using a CF FAB interface femtomole quantities of different classes of compounds were detected which is two orders of magnitude more sensitive than by standard FAB Later CF FAB was applied to the analysis of didemnin streptovaricin and ecteinascidin mixtures in isocratic and or gradient modes The first application led to the discovery of acyclo desHIP didemnin A in a mixture of didemnins cyclic peptides of potent antitumor and antiviral activity Although related to didemnins the linear peptide was biologically inactive The second application project involved streptovaricins secondary metabolites of *Streptomyces spectabilis* In the streptovaricin mixture besides streptovaricins protostreptovaricins III and IV were detected by LC CF FABMS The presence of protostreptovaricins in the streptovaricin complex confirmed the biosynthetic pathway proposed for streptovaricin C Even though these precursors were known previously they were not observed as components of the mixture by standard FABMS When ecteinascidins were analyzed by LC CF FABMS the most significant difference was the amount of structural information generated in the low mass range in comparison to the standard FAB spectra The hydrates of structurally significant fragment ions were observed when the background was subtracted The use of a CF FAB interface was extended to on line high resolution mass measurements of different components in the mixture Mass measurements were within the range of acceptable error On line LC CF FABMS MS was performed on the ecteinascidin mixture using B E linked scans Observed ions were then classified as group characteristic or compound specific Finally CF FAB was compared to electrospray ionization ESI as an LC MS and LC MS MS interface with respect to sensitivity and structural information In the selected ion chromatogram mode the sensitivity of CF FAB is comparable to that of LC ESIMS However identification of unknowns is more feasible by LC ESIMS than by LC CF FABMS Also the daughter ion mass spectra can be produced even on trace amounts by LC ESIMS MS and are of better quality than by LC CF FABMS MS In LC ESIMS MS similar structural information is obtained however the main difference is the relative intensities of the fragment ions Several new

ecteinascidins were observed by LC ESIMS Their structures are proposed on the basis of LC ESIMS MS data Liquid Chromatography Wilfried M.A. Niessen,1998-09-01 This volume comprehensively relates developments principles and applications of combined liquid chromatography mass spectrometry and other techniques such as capillary electrophoresis and supercritical fluid chromatography combined with mass spectrometry It covers historical developments currently important interfaces and technologies and LC MS applications in environmental analysis pharmaceuticals and bioanalysis and additional fields It offers in depth coverage of interfaces and technologies currently important in the laboratory especially electrospray and APCI contains an expanded applications section and provides over 2200 references tables equations and drawings **The Encyclopedia of Mass Spectrometry** ,2015-12-04 Volume 9 Historical Perspectives Part A The Development of Mass Spectrometry of The Encyclopedia of Mass Spectrometry describes and analyzes the development of many aspects of Mass Spectrometry Beginning with the earliest types of Mass Analyzers Historical Perspectives explores the development of many different forms of analytical processes and methods The work follows various instruments and interfaces to the current state of detectors and computerization It traces the use of Mass Spectrometry across many different disciplines including Organic Chemistry Biochemistry and Proteomics Environmental Mass Spectrometry Forensic Science Imaging Medical Monitoring and Diagnosis Earth and Planetary Sciences and Nuclear Science Finally the book covers the history of manufacturers and societies as well as the professionals who form the Mass Spectrometry community Also available Volume 9 Historical Perspectives Part B Notable People in Mass Spectrometry briefly reviews the lives and works of many of the major people who carried out this development Preserves the history and development of Mass Spectrometry for use across scientific fields Written and edited by Mass Spectrometry experts Coordinates with Volume 9 Historical Perspectives Part B Notable People in Mass Spectrometry a collection of short biographies on many of the major people who carried out this development Mass Spectrometry of Peptides Dominic M. Desiderio,2024-12-20 The purpose of this book is to collect into one volume the research done on the mass spectrometry of peptides It balances a range of topics including theory instrumentation analytical techniques and biological applications The scope of the work contains three major sections ionization methods instrumental developments and analysis of peptides It describes 252Cf plasma desorption and laser induced multiphoton ionization methodology This exciting resource covers many new areas including continuous flow FAB quantification of human neuropeptides and peptide mapping It also discusses Q FTMS cross links and metal ions

**Continuous-flow Fast Atom Bombardment Liquid Chromatography-mass Spectrometry in Bioanalysis** Paula S. Kokkonen,1991 **Mass Spectrometry** Jürgen H Gross,2011-01-19 This book offers a balanced mixture of practice oriented information and theoretical background as well as numerous references clear illustrations and useful data tables Problems and solutions are accessible via a special website This new edition has been completely revised and extended it now includes three new chapters on tandem mass spectrometry interfaces for sampling at atmospheric pressure and inorganic mass

spectrometry     *Mass Spectrometry* Agnieszka Kraj,Dominic M. Desiderio,Nico M. Nibbering,2008-12-01 With contributions from noted experts from Europe and North America *Mass Spectrometry Instrumentation Interpretation and Applications* serves as a forum to introduce students to the whole world of mass spectrometry and to the many different perspectives that each scientific field brings to its use The book emphasizes the use of this important analytical technique in many different fields including applications for organic and inorganic chemistry forensic science biotechnology and many other areas After describing the history of mass spectrometry the book moves on to discuss instrumentation theory and basic applications

**Mass Spectrometry** Dominic M. Desiderio,2013-06-29 The current volume reviews novel instrumentation and techniques as applied to the analysis of diacylglycerolphospholipids modifications to DNA and the characterization of variant hemoglobins It reflects the flexible broad based approaches mass spectroscopists apply to clinical and biomedical challenges

*Mass Spectrometry in the Biological Sciences: A Tutorial* M.L Gross,2012-12-06 The developments in mass spectrometry over the past fifteen years have been impressive in their implications in bioanalytical chemistry The achievements begin with the inventions of Cf 252 Plasma Desorption Mass Spectrometry by Macfarlane and Fourier Transform Mass Spectrometry by Comisarow and Marshall in the mid 1970s The former showed the feasibility of producing large gas phase ions from large biomolecules whereas the latter enhanced the capabilities for ion trapping especially in analytical mass spectrometry A major achievement was the development by Barber of Fast Atom Bombardment FAB mass spectrometry an advance that heralded a new era in biological mass spectrometry Contemporary and routine instruments such as magnetic sectors and quadrupoles were rapidly adapted to F AB and nearly the entire universe of small molecules became amenable to study by mass spectrometry The introduction of FAB also paved the way for improvement of instrument capability For example the upper mass limit of magnet sector mass spectrometers was increased by nearly an order of magnitude by the instrument manufacturers Furthermore the technique of tandem mass spectrometry MS MS was given new meaning because important structural information for biomolecules could now be produced for ions introduced by FAB into the tandem instrument The evolution of MS MS continues today with the development of ion traps time of flight and sector instruments equipped with array detection

*Mass Spectrometry in Biomolecular Sciences* Richard M. Caprioli,A. Malorni,G. Sindona,2012-12-06 *Mass Spectrometry in the Biological Sciences* covers the most recent technological and applied developments in the area including both ionization techniques and ion analysis It introduces and reviews some of the newer ionization methods describes the major instrumentation involved in mass analysis and presents the scope of the technology in biology medicine and environmental science Specific examples are given for a number of topics It also deals with recent achievements in the on line combination of separation techniques such as gas chromatography liquid chromatography and supercritical fluid technology

**Capillary Electrophoresis** Patrick Camilleri,1997-11-25 The importance of capillary electrophoresis CE as an analytical tool has increased dramatically over the last ten years It has changed from being an exploratory technique

mainly of academic interest to one that is applied to solve real analytical problems CE is easily adapted to its various modes of operation often requiring little more than a change of the buffer solution and is quickly becoming the preferred technique when analyzing minute amounts of available material Featuring new chapters on CE analysis of inorganic ions and carbohydrates the new edition of Capillary Electrophoresis not only presents this method as an academic tool but also provides applications for solving real world analytical problems This updated Second Edition reflects the increasing use of CE over the last 10 years how it is being applied and the basic theoretical aspects of the separation and detection methodology of CE Capillary Electrophoresis Theory and Practice will appeal to students and professionals of analytical chemistry physical chemistry biochemistry and biotechnology and includes suitable experiments designed to be attempted by university or college students or anyone else wishing to familiarize themselves with CE

*Fundamentals of Contemporary Mass Spectrometry* Chhabil Dass, 2007-05-11 Modern mass spectrometry the instrumentation and applications in diverse fields Mass spectrometry has played a pivotal role in a variety of scientific disciplines Today it is an integral part of proteomics and drug discovery process Fundamentals of Contemporary Mass Spectrometry gives readers a concise and authoritative overview of modern mass spectrometry instrumentation techniques and applications including the latest developments After an introduction to the history of mass spectrometry and the basic underlying concepts it covers Instrumentation including modes of ionization condensed phase ionization techniques mass analysis and ion detection tandem mass spectrometry and hyphenated separation techniques Organic and inorganic mass spectrometry Biological mass spectrometry including the analysis of proteins and peptides oligosaccharides lipids oligonucleotides and other biological materials Applications to quantitative analysis Based on proven teaching principles each chapter is complete with a concise overview highlighted key points practice exercises and references to additional resources Hints and solutions to the exercises are provided in an appendix To facilitate learning and improve problem solving skills several worked out examples are included This is a great textbook for graduate students in chemistry and a robust practical resource for researchers and scientists professors laboratory managers technicians and others It gives scientists in diverse disciplines a practical foundation in modern mass spectrometry

Capillary Electrophoresis in Biotechnology and Environmental Analysis Hasan Parvez, Caudy, Roland-Gosselin, 2023-01-06 This text aims to evaluate the actual impact of high performance capillary electrophoresis on analytical biotechnology and environmental analysis The first part of the book presents a survey of present innovations in instrument design and different methods of pre concentration techniques in order to obtain increased separations at higher sensitivities The second part contains articles on applications of HPCE to protein and peptide analysis In the third part applications of HPCE in the investigation of drug abuse and drug interactions are presented The last two parts of the book deal with the use of HPCE at low UV wavelengths and negative UV absorption The book should be of interest to those working in HPCE research and applications

Mass Spectrometry of Nucleosides and Nucleic Acids Joseph

H. Banoub, Patrick A. Limbach, 2009-12-21 Assembling the work of an international panel of researchers *Mass Spectrometry of Nucleosides and Nucleic Acids* summarizes and reviews the latest developments in the field and provides a window on the next generation of analysis Beginning with an overview of recent developments the book highlights the most popular ionization methods and illustrates *Ionization Methods in Organic Mass Spectrometry* Alison E Ashcroft, 2007-10-31

*Ionization Methods in Organic Mass Spectrometry* is a basic practical guide for scientists of all disciplines who wish to analyse samples by organic mass spectrometry Concentrating on instrumental operation this book gives step by step instructions on how to set up and how to achieve the best results using a range of ionization methods including atmospheric pressure chemical ionization electrospray ionization and matrix assisted laser desorption ionization *Ionization Methods in Organic Mass Spectrometry* will enable a beginner or practitioner with limited experience to choose the most appropriate ionization technique in application areas such as biomolecules drugs and metabolites pesticides polymers and many other organic compounds It will be a valuable practical guide for technicians graduates students or researchers or indeed anyone new to practical organic mass spectrometry

### **High Performance Liquid Chromatography & Capillary**

**Electrophoresis** Andrea Weston, Phyllis R. Brown, 1997-07-21 HPLC and CE Principles and Practice presents the latest information on the most powerful separation techniques available high performance liquid chromatography HPLC and capillary electrophoresis CE Fundamental theory instrumentation modes of operation and optimization of separations are presented in a concise non technical style to help the user in choosing the appropriate technique quickly and accurately Well illustrated and containing convenient end of chapter summaries of the major concepts the book provides in depth coverage of troubleshooting improvement of resolution data manipulation selectivity and sensitivity Graduate students technicians and researchers who must use separations with little or no background in analytical chemistry can overcome separation anxiety and get started in obtaining the best possible separations in minimal time The book will also be useful to analytical chemists who need a better understanding of theory and processes Fully up to date information on both HPLC and CE includes troubleshooting and comparisons of the two techniques Applicable to a wide variety of separation problems Covers basic concepts governing any separation as well as instrumentation and how to use it Helps the user to obtain optimal resolution in minimal time Contains information on special procedures such as chiral separations affinity chromatography and sample preparation Includes information on upcoming trends such as miniaturization Major concepts in each chapter are organized to allow access to information easily and quickly Contains practical bibliography for accessing the literature

Capillary Electrophoresis in Analytical Biotechnology Pier Giorgio Righetti, 1995-12-18 This new book on capillary electrophoresis CE is unique in its focus on biotechnology It is devoted to proteins peptides and techniques especially useful in the area of recombinant DNA products Emphasis is also placed on glycoproteins Because of the growing role of the glycosylation process in CE a comprehensive chapter on the subject acts as a book within a book Although this well known researcher in

biotechnology presents a number of chapters extensively discussing theories important practical aspects in the routine use of capillary electrophoresis are also covered

### **Introduction to Biophysical Methods for Protein and Nucleic Acid**

**Research** Jay A. Glasel, Murray P. Deutscher, 1995-11-20 The first of its kind Introduction to Biophysical Methods for Protein and Nucleic Acid Research serves as a text for the experienced researcher and student requiring an introduction to the field Each chapter presents a description of the physical basis of the method the type of information that may be obtained with the method how data should be analyzed and interpreted and where appropriate practical tips about procedures and equipment Key Features Modern Use of Mass Spectroscopy NMR Spectroscopy Molecular Modeling and Graphics Macintosh and DOS Windows 3 x disks



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