Free ebook Sample preparation for flame atomic absorption .pdf

provides a thorough up to date survey of techniques for elemental analysis including atomic absorption spectroscopy atomic fluorescence flame photometry emission spectroscopy and plasma emission second edition includes expanded material on interfaced plasma mass spectrometry icp ms diode arrays and other emerging spectroscopic fields this book describes both the theory of atomic spectroscopy and all the major atomic spectrometric techniques aas flame aes plasma aes afs and icp ms including basic concepts instrumentation and applications spectrochemical analysis by atomic absorption and emission is very wide in scope and will be extremely useful to both undergraduates and lecturers undertaking modern analytical chemistry courses it contains many figures and tables which illuminate the text covers various sample preparation methods and gives suggestions for further reading atomic absorption spectroscopy documents the proceedings of the second international conference held at the university of sheffield u k between july 14 and 18 1969 this compilation deals with all aspects of atomic absorption spectroscopy focusing on fundamental developments metallurgical and biological applications of atomic absorption spectroscopy atomic fluorescence spectroscopy developments in instrumentation theoretical aspects and chemical and physical interference effects the analytical flame atomic emission spectroscopy and development of non flame sample cells for atomic spectroscopy are also considered other topics include the behavior of certain elements in the absorption tube and progress in atomic absorption spectroscopy employing flame and graphite cuvette techniques this book is a good source for students specialists and researchers conducting work on atomic absorption spectroscopy general introduction and theory instrumentation technique elements applications to biological materials industrial applications geochemical applications analytical chemistry second edition volume 6 atomic absorption spectrophotometry focuses on the use of atomic absorption spectrophotometry as an analytical technique this book discusses the developments in the analytical fields of atomic absorption spectrophotometry organized into seven chapters this edition starts with an overview of the fundamental principles underlying atomic absorption spectra this book then describes the use of high temperature fuel rich flames that allow the determination of some elements that were not previously capable of being determined by atomic absorption spectrophotometry other chapters explore the advantages of improved instrumentation and consider the atomic absorption procedures that have been applied to a wide variety of samples from agricultural and biological materials this book discusses as well the determination of specified elements by a direct examination of the sample solution the final chapter provides a list of instruments that are commercially available with emphasis on their characteristics this book is a valuable resource for analysts physicists and chemists high resolution continuum source atomic absorption spectrometry hr cs aas is the most revolutionary innovation since the introduction of aas in 1955 here the authors provide the first complete and comprehensive discussion of hr cs aas and its application to the analysis of a variety of difficult matrices published just in time with the first commercial instrument available for this new technique the book is a must for all those who want to know more about hr cs aas and in particular for all future users the advantages of the new technique over conventional line source aas are clearly demonstrated using practical examples and numerous figures many in full color hr cs aas is overcoming essentially all the remaining limitations of established aas particularly the notorious problem of accurate background measurement and correction using a continuum radiation source and a ccd array detector makes the spectral environment visible to several tenths of a nanometer on both sides of the analytical line tremendously facilitating method development and elimination of interferences conceived as a supplement to the standard reference work on aas by b welz and m sperling this book does not repeat such fundamentals as the principles of atomizers or atomization mechanisms instead it is strictly focused on new and additional information required to profit from hr cs aas it presents characteristic concentration for flame atomization and characteristic mass data for electrothermal atomization for all elements as well as listing numerous secondary lines of lower sensitivity for the determination of higher analyte concentrations the highly resolved molecular absorption spectra of nitric sulfuric and phosphoric acids observed in an air acetylene flame which are depicted together with the atomic lines of all elements make it possible to predict potential spectral interferences

atomic absorption spectroscopy is an analytical technique used for the qualitative and quantitative determination of the elements present in different samples like food nanomaterials biomaterials forensics and industrial wastes the main aim of this book is to cover all major topics which are required to equip scholars with the recent advancement in this field the book is divided into 12 chapters with an emphasis on specific topics the first two chapters introduce the reader to the subject it s history basic principles instrumentation and sample preparation chapter 3 deals with the elemental profiling functions biochemistry and potential toxicity of metals along with comparative techniques chapter 4 discusses the importance of sample preparation techniques with the focus on microextraction techniques keeping in view the importance of nanomaterials and refractory materials chapters 5 and 6 highlight the ways to characterize these materials by using aas the interference effects between elements are explained in chapter 7 the characterizations of metals in food and biological samples have been given in chapters 8 11 chapter 12 examines carbon capture and mineral storage with the analysis of metal contents this atlas was begun mainly to gather together information on atomic absorption spectral lines for the use of practicing analyt ical chemists who often find it necessary to use less sensitive lines it was hoped that pertinent data could be obtained and for the first time published in a single format in one place this effort led to the realization that many workers in the field employ atomic emission and atomic absorption as complemen tary techniques therefore it was decided to include both of these techniques in the atlas finally it was decided that because atomic fluorescence spectroscopy shows so much promise as an analytical tool the available data for this method should be included as well since these three techniques provide fruitful research areas today it is not possible to prepare a compilation of this scope and remain completely up to date for practical reasons a cutoff date has to be set at which organization and typing begin for this atlas in most cases the literature references are complete through 1969 it is felt however that the absence of later references especially in the areas of flame emission spectroscopy and atomic absorption spectroscopy will not impair the usefulness of the atlas for the practicing analyst to any great degree v acknowledgments the authors are greatly indebted to dr j d winefordner who gathered together most of the information on atomic fluores cence spectroscopy using a different format the authors are also indebted to mrs betty bulechek the typist fundamentals instrumental systems range and limitations of atomic absorption methods experimental methods applications die atomabsorptionsspektroskopie mit graphitrohrküvetten wird vor allem in der material und umweltwissenschaft zur untersuchung von legierungen keramiken polymeren kompositwerkstoffen und abwässern eingesetzt dieses umfangreiche handbuch enthält viele praktische beispiele tips und tricks sowie angaben zur instrumentellen ausrüstung zu modernen entwicklungen und zur fehlersuche eine wahre fundgrube für den praktiker jedoch auch für einsteiger geeignet mit verschiedenen anhängen historischen hintergrundinformationen literaturverzeichnissen und einem glossar der verwendeten fachterminologie 06 98 atomic absorption spectrometry in geology focuses on the applications of atomic absorption spectrometry in geology including the analysis of metals rocks sediments and minerals the manuscript first offers information on the theory of atomic absorption spectrophotometry and instrumentation discussions focus on the relationship of atomic absorption with atomic concentration variations in shapes and widths of atomic spectral lines variations in atomic spectral lines sample vaporization and light sources the book then examines interferences including spectral ionization chemical and molecular interferences the publication takes a look at hydrogeochemistry and ore analysis topics include freshwater and seawater zinc and cadmium mercury silver gold copper lead and nickel the text also ponders on rock and mineral analysis sediments isotopes and noble gases as well as silicate and sulfide minerals organic fraction of sediments and lithium uranium boron and mercury isotopes the manuscript is a dependable reference for readers interested in atomic absorption spectrometry analytical atomic absorption spectroscopy presents the theories methods and principles in absorption spectrometry in an easily readable fashion that would suit the practicing analyst the book covers the general principles involved in atomic spectroscopy such as atomization and optical systems electronic signal processing and calibration procedures and accuracy and precision the text then moves on to the preparation determination and analysis of different substances such as waters geological materials metals and alloys air samples petroleum products industrial samples and metal compounds the book also covers developments in the different areas of atomic spectroscopy such as radiation sources spectrometers detectors and other instruments the text is recommended for practitioners and experts in the field of atomic spectroscopy especially those looking for a book that details theories practices and advancements in the subject analytical flame spectroscopy is a rich and growing disci pline rooted in the

broad fields of physics and chemistry its applications abound not only in these large areas but also thrive in the geosciences materials science and clinical and biochemical analysis as an inevitable corollary of the field s growth the scientist seeking to develop a fluent expertise has been forced to assimilate and master a rapidly increasing quantity of information our guiding hope in creating the present work has therefore been to provide the investigator with a single reference source for nearly all the material ever likely to be required in the daily conduct of basic or applied research flame spectroscopy is not a new analytical field it has seen at least three major eras in each of which much new information was developed the bunsen kirchhoff years the beckman d u years and finally the atomic absorption years in the bunsen kirchhoff era several new elements were discovered during the beckman years nearly all the early flame emission data were taken on modified beckman d u spectrometers trace metal analysis for the alkaline metals and for many alkaline earth elements reached a new high low the parts per million level more recently trace metal analysis has in general achieved a new maturity with the advent of atomic absorption analysis which was co discovered by c th j alkemade and alan walsh in 1955 spectroscopic theory theory of atomic absorption measurements theory of atomic fluorescence measurements spectral light sources flames non flame absorption and fluorescence cells introduction of liquid samples into flame atom cells wavelength selection atomic absorption and fluorescence instrumentation practical techniques of atomic absorption and fluorescence spectroscopy interferences analytical aas and afs characteristics of the elements and applications data special techniques in aas and afs flame spectrometry in environmental chemical analysis is a simple user friendly guide to safe flame spectrometric methods for environmental samples it explains key processes involved in achieving accurate and reliable results in atomic absorption spectrometry atomic fluorescence spectrometry and flame emission spectrometry showing the inter relationship of the three techniques and their relative importance flame spectrometry in environmental chemical analysis presents the important information with thoroughness and clarity and in a style that makes it valuable to students and researchers using these techniques it also offers straightforward reading for environmentalists with interests in such areas as pollution research agriculture ecology soil science geology and forestry informing researchers of exactly what they can expect to be able to determine by flame spectrometric methods newcomers to flame spectrometry will gain increased confidence job skills and many handy tips and ideas from this book it will impart a strong working knowledge that can be translated into sound data in the laboratory atomic absorption spectroscopy is now a well established technique for the determination of trace elements covering a wide range of analyte types the early theory and instrumentation chapters incorporate recent trends in instrumental design and methodology in particular those associated with electrothermal techniques and background correction the major thrust of the book is represented by 14 application chapters which give an extensive well referenced review of the practical use of the technique written by experts drawn from their own speciality areas these include the determination of trace elements in areas as diverse as environmental chemical and industrial analysis whilst the book is primarily concerned with atomic absorption spectroscopy any analyst involved in sample handling prior to trace elemental analysis will find this book a valuable compendium of methodology drawn from a very wide range of applications for the current user of the technique the well referenced sections critically evaluate the state of the art while for the newer user the text will form the basis of a good laboratory handbook which offers a comprehensive instruction on the theory and instrumental design in atomic absorption spectroscopy flame atomic absorption spectrometry iron ores determination of content sintered products chemical analysis and testing atomic absorption spectrophotometry metalliferous minerals nickel conglomerates concentrates this textbook is an outgrowth of the author s experience in teaching a course primarily to graduate students in chemistry that included the subject matter presented in this book the increasing use and importance of atomic spectroscopy as an analytical tool are quite evident to anyone involved in elemental analysis a number of books are available that may be considered treatises in the various fields that use atomic spectra for analytical purposes these include areas such as arc spark emission spectroscopy flame emission spectroscopy and atomic absorption spectroscopy other books are available that can be catalogued as methods books most of these books serve well the purpose for which they were written but are not well adapted to serve as basic textbooks in their fields this book is intended to fill the aforementioned gap and to present the basic principles and instrumentation involved in analytical atomic spectro scopy to meet this objective the book includes an elementary treatment of the origin of atomic spectra the instrumentation and accessory equipment used in atomic spectroscopy and the principles involved

in arc spark emission flame emission atomic absorption and atomic fluorescence the chapters in the book that deal with the methods of atomic spectro scopy discuss such things as the basic principles involved in the method the instrumentation requirements variations of instrumentation advantages and disadvantages of the method problems of interferences detection limits the collection and processing of the data and possible applications may 2003

Flame Emission and Atomic Absorption Spectrometry *2000*

provides a thorough up to date survey of techniques for elemental analysis including atomic absorption spectroscopy atomic fluorescence flame photometry emission spectroscopy and plasma emission second edition includes expanded material on interfaced plasma mass spectrometry icp ms diode arrays and other emerging spectroscopic fields

Flame Emission and Atomic Absorption Spectrometry: Components and techniques *1969*

this book describes both the theory of atomic spectroscopy and all the major atomic spectrometric techniques aas flame aes plasma aes afs and icp ms including basic concepts instrumentation and applications spectrochemical analysis by atomic absorption and emission is very wide in scope and will be extremely useful to both undergraduates and lecturers undertaking modern analytical chemistry courses it contains many figures and tables which illuminate the text covers various sample preparation methods and gives suggestions for further reading

Flame Emission and Atomic Absorption Spectrometry *1969*

atomic absorption spectroscopy documents the proceedings of the second international conference held at the university of sheffield u k between july 14 and 18 1969 this compilation deals with all aspects of atomic absorption spectroscopy focusing on fundamental developments metallurgical and biological applications of atomic absorption spectroscopy atomic fluorescence spectroscopy developments in instrumentation theoretical aspects and chemical and physical interference effects the analytical flame atomic emission spectroscopy and development of non flame sample cells for atomic spectroscopy are also considered other topics include the behavior of certain elements in the absorption tube and progress in atomic absorption spectroscopy employing flame and graphite cuvette techniques this book is a good source for students specialists and researchers conducting work on atomic absorption spectroscopy

Atomic Spectroscopy, Second Edition, *1996-07-24*

general introduction and theory instrumentation technique elements applications to biological materials industrial applications geochemical applications

Atomic Absorption, Fluorescence, and Flame Emission Spectroscopy *1978*

analytical chemistry second edition volume 6 atomic absorption spectrophotometry focuses on the use of atomic absorption spectrophotometry as an analytical technique this book discusses the developments in the analytical fields of atomic absorption spectrophotometry organized into seven chapters this edition starts with an overview of the fundamental principles underlying atomic absorption spectra this book then describes the use of high temperature fuel rich flames that allow the determination of some elements that were not previously capable of being determined by atomic absorption spectrophotometry other chapters explore the advantages of improved instrumentation and consider the atomic absorption procedures that have been applied to a wide variety of samples from agricultural and biological materials this book discusses as well the determination of specified elements by a direct examination of the sample solution the final chapter provides a list of instruments that are commercially available with emphasis on their characteristics this book is a valuable resource for analysts physicists and chemists

Flame emission and atomic absorption spectrometry. 1. Theory *1969*

high resolution continuum source atomic absorption spectrometry hr cs aas is the most revolutionary innovation since

the introduction of aas in 1955 here the authors provide the first complete and comprehensive discussion of hr cs aas and its application to the analysis of a variety of difficult matrices published just in time with the first commercial instrument available for this new technique the book is a must for all those who want to know more about hr cs aas and in particular for all future users the advantages of the new technique over conventional line source aas are clearly demonstrated using practical examples and numerous figures many in full color hr cs aas is overcoming essentially all the remaining limitations of established aas particularly the notorious problem of accurate background measurement and correction using a continuum radiation source and a ccd array detector makes the spectral environment visible to several tenths of a nanometer on both sides of the analytical line tremendously facilitating method development and elimination of interferences conceived as a supplement to the standard reference work on aas by b welz and m sperling this book does not repeat such fundamentals as the principles of atomizers or atomization mechanisms instead it is strictly focused on new and additional information required to profit from hr cs aas it presents characteristic concentration for flame atomization and characteristic mass data for electrothermal atomization for all elements as well as listing numerous secondary lines of lower sensitivity for the determination of higher analyte concentrations the highly resolved molecular absorption spectra of nitric sulfuric and phosphoric acids observed in an air acetylene flame which are depicted together with the atomic lines of all elements make it possible to predict potential spectral interferences

Flame Emission and Atomic Absorption Spectrometry *1971*

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Recommended Practice for Chemical Analysis by Atomic Absorption Spectrometry, Part 1 *1999*

this atlas was begun mainly to gather together information on atomic absorption spectral lines for the use of practicing analyt ical chemists who often find it necessary to use less sensitive lines it was hoped that pertinent data could be obtained and for the first time published in a single format in one place this effort led to the realization that many workers in the field employ atomic emission and atomic absorption as complemen tary techniques therefore it was decided to include both of these techniques in the atlas finally it was decided that because atomic fluorescence spectroscopy shows so much promise as an analytical tool the available data for this method should be included as well since these three techniques provide fruitful research areas today it is not possible to prepare a compilation of this scope and remain completely up to date for practical reasons a cutoff date has to be set at which organization and typing begin for this atlas in most cases the literature references are complete through 1969 it is felt however that the absence of later references especially in the areas of flame emission spectroscopy and atomic absorption spectroscopy will not impair the usefulness of the atlas for the practicing analyst to any great degree v acknowledgments the authors are greatly indebted to dr j d winefordner who gathered together most of the information on atomic fluores cence spectroscopy using a different format the authors are also indebted to mrs betty bulechek the typist

Spectrochemical Analysis by Atomic Absorption and Emission *2007-10-31*

fundamentals instrumental systems range and limitations of atomic absorption methods experimental methods applications

Flame Emission and Atomic Absorption Spectrometry: Theory *1969*

die atomabsorptionsspektroskopie mit graphitrohrküvetten wird vor allem in der material und umweltwissenschaft zur untersuchung von legierungen keramiken polymeren kompositwerkstoffen und abwässern eingesetzt dieses umfangreiche handbuch enthält viele praktische beispiele tips und tricks sowie angaben zur instrumentellen ausrüstung zu modernen entwicklungen und zur fehlersuche eine wahre fundgrube für den praktiker jedoch auch für einsteiger geeignet mit verschiedenen anhängen historischen hintergrundinformationen literaturverzeichnissen und einem glossar der verwendeten fachterminologie 06 98

Atomic Absorption Spectroscopy *2013-10-22*

atomic absorption spectrometry in geology focuses on the applications of atomic absorption spectrometry in geology including the analysis of metals rocks sediments and minerals the manuscript first offers information on the theory of atomic absorption spectrophotometry and instrumentation discussions focus on the relationship of atomic absorption with atomic concentration variations in shapes and widths of atomic spectral lines variations in atomic spectral lines sample vaporization and light sources the book then examines interferences including spectral ionization chemical and molecular interferences the publication takes a look at hydrogeochemistry and ore analysis topics include freshwater and seawater zinc and cadmium mercury silver gold copper lead and nickel the text also ponders on rock and mineral analysis sediments isotopes and noble gases as well as silicate and sulfide minerals organic fraction of sediments and lithium uranium boron and mercury isotopes the manuscript is a dependable reference for readers interested in atomic absorption spectrometry

Atomic Absorption Spectroscopy *1976*

analytical atomic absorption spectroscopy presents the theories methods and principles in absorption spectrometry in an easily readable fashion that would suit the practicing analyst the book covers the general principles involved in atomic spectroscopy such as atomization and optical systems electronic signal processing and calibration procedures and accuracy and precision the text then moves on to the preparation determination and analysis of different substances such as waters geological materials metals and alloys air samples petroleum products industrial samples and metal compounds the book also covers developments in the different areas of atomic spectroscopy such as radiation sources spectrometers detectors and other instruments the text is recommended for practitioners and experts in the field of atomic spectroscopy especially those looking for a book that details theories practices and advancements in the subject

Flame Emission and Atomic Absorption Spectrometry *1969*

analytical flame spectroscopy is a rich and growing disci pline rooted in the broad fields of physics and chemistry its applications abound not only in these large areas but also thrive in the geosciences materials science and clinical and biochemical analysis as an inevitable corollary of the field s growth the scientist seeking to develop a fluent expertise has been forced to assimilate and master a rapidly increasing quantity of information our guiding hope in creating the present work has therefore been to provide the investigator with a single reference source for nearly all the material ever likely to be required in the daily conduct of basic or applied research flame spectroscopy is not a new analytical field it has seen at least three major eras in each of which much new information was developed the bunsen kirchhoff years the beckman d u years and finally the atomic absorption years in the bunsen kirchhoff era several new

elements were discovered during the beckman years nearly all the early flame emission data were taken on modified beckman d u spectrometers trace metal analysis for the alkaline metals and for many alkaline earth elements reached a new high low the parts per million level more recently trace metal analysis has in general achieved a new maturity with the advent of atomic absorption analysis which was co discovered by c th j alkemade and alan walsh in 1955

Atomic Absorption Spectroscopy *1968*

spectroscopic theory theory of atomic absorption measurements theory of atomic fluorescence measurements spectral light sources flames non flame absorption and fluorescence cells introduction of liquid samples into flame atom cells wavelength selection atomic absorption and fluorescence instrumentation practical techniques of atomic absorption and fluorescence spectroscopy interferences analytical aas and afs characteristics of the elements and applications data special techniques in aas and afs

Atomic-Absorption Spectrophotometry *2013-10-22*

flame spectrometry in environmental chemical analysis is a simple user friendly guide to safe flame spectrometric methods for environmental samples it explains key processes involved in achieving accurate and reliable results in atomic absorption spectrometry atomic fluorescence spectrometry and flame emission spectrometry showing the inter relationship of the three techniques and their relative importance flame spectrometry in environmental chemical analysis presents the important information with thoroughness and clarity and in a style that makes it valuable to students and researchers using these techniques it also offers straightforward reading for environmentalists with interests in such areas as pollution research agriculture ecology soil science geology and forestry informing researchers of exactly what they can expect to be able to determine by flame spectrometric methods newcomers to flame spectrometry will gain increased confidence job skills and many handy tips and ideas from this book it will impart a strong working knowledge that can be translated into sound data in the laboratory

Glossary of Terms Used in Flame Atomic Absorption Spectroscopy *1978*

atomic absorption spectroscopy is now a well established technique for the determination of trace elements covering a wide range of analyte types the early theory and instrumentation chapters incorporate recent trends in instrumental design and methodology in particular those associated with electrothermal techniques and background correction the major thrust of the book is represented by 14 application chapters which give an extensive well referenced review of the practical use of the technique written by experts drawn from their own speciality areas these include the determination of trace elements in areas as diverse as environmental chemical and industrial analysis whilst the book is primarily concerned with atomic absorption spectroscopy any analyst involved in sample handling prior to trace elemental analysis will find this book a valuable compendium of methodology drawn from a very wide range of applications for the current user of the technique the well referenced sections critically evaluate the state of the art while for the newer user the text will form the basis of a good laboratory handbook which offers a comprehensive instruction on the theory and instrumental design in atomic absorption spectroscopy

Recommended Practice for Chemical Analysis by Atomic Absorption Spectrometry *1988*

flame atomic absorption spectrometry iron ores determination of content sintered products chemical analysis and testing atomic absorption spectrophotometry metalliferous minerals nickel conglomerates concentrates

Chemical Analysis of Materials by Flame Atomic Absorption Spectroscopy *1978*

this textbook is an outgrowth of the author s experience in teaching a course primarily to graduate students in chemistry that included the subject matter presented in this book the increasing use and importance of atomic spectroscopy as an analytical tool are quite evident to anyone involved in elemental analysis a number of books are available that may be considered treatises in the various fields that use atomic spectra for analytical purposes these include areas such as arc spark emission spectroscopy flame emission spectroscopy and atomic absorption spectroscopy other books are available that can be catalogued as methods books most of these books serve well the purpose for which they were written but are not well adapted to serve as basic textbooks in their fields this book is intended to fill the aforementioned gap and to present the basic principles and instrumentation involved in analytical atomic spectro scopy to meet this objective the book includes an elementary treatment of the origin of atomic spectra the instrumentation and accessory equipment used in atomic spectroscopy and the principles involved in arc spark emission flame emission atomic absorption and atomic fluorescence the chapters in the book that deal with the methods of atomic spectro scopy discuss such things as the basic principles involved in the method the instrumentation requirements variations of instrumentation advantages and disadvantages of the method problems of interferences detection limits the collection and processing of the data and possible applications

High-Resolution Continuum Source AAS 2006-03-06

may 2003

Atomic Absorption Spectroscopy 2012-01-20

Flame Spectroscopy: Atlas of Spectral Lines 2012-12-06

Atomic Absorption Spectrometry *1985*

Atomic Absorption Spectroscopy *1969*

Atomic-absorption Spectroscopy and Analysis by Atomic-absorption Flame Photometry *1968*

A Practical Guide to Graphite Furnace Atomic Absorption Spectrometry 1998-03-23

Atomic Absorption Spectrometry in Geology *2013-10-22*

Analytical Atomic Absorption Spectroscopy *2012-12-02*

Fundamentals of Analytical Flame Spectroscopy 1979

Handbook of Flame Spectroscopy *2013-11-11*

Atomic Absorption and Fluorescence Spectroscopy *1974*

Atomic Absorption Newsletter *1979*

Atomic Absorption Spectroscopy 1970

Flame Spectrometry in Environmental Chemical Analysis *2007-10-31*

Atomic Absorption Spectrophotometry *1971*

Atomic Absorption Spectrometry 1991-11-21

Iron Ores. Determination of Nickel. Flame Atomic Absorption Spectrometric Method 1917-09-18

Analytical Atomic Spectroscopy *2012-12-06*

Atomic Absorption Spectrometry *1975*

Flame Spectroscopy 1965

Atomic Absorption Spectroscopy *1970*

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