

## CONTENTS

	Page
Foreword.....	III-IV
Preface.....	v-VI
Abstract.....	VII

## VOLUME I

## Part I. GENERAL CONSIDERATIONS

The <b>Need</b> for Accuracy in a Regulatory Agency <i>Albert C. Kolbye, Jr.</i> .....	3
Accuracy and Trace Organic <b>Analyses</b> <i>Robert G. Lewis</i> .....	9
Accuracy and Quality Control in Trace Element Analysis <i>Joseph H. Boutwell</i> .....	35
The Role of the National Bureau of Standards Standard Reference Materials in Accurate Trace Analysis <i>J. Pad Cali and William P. Reed</i> .....	41
Interpretation of Accuracy of Trace Element Results for Biological Materials <i>George H. Morrison</i> .....	65
Recision and Accuracy in Silicate Analysis <i>Samuel S. Goldich</i> .....	79
Use and Interpretation of Water Quality Data <i>William T. Sayers and Wayne R. Orr</i> .....	91
Interpretation of Clinical Laboratory Data <i>Donald S. Young</i> .....	109
The Analyst and Accuracy <i>Francis P. Byrne</i> .....	123
<b>Detection</b> of Systematic Errors by the Analysis of Recision <i>Kai Heydorn</i> .....	127
Detection of Systematic Error in Routine Trace Analysis <i>Donald E. King</i> .....	141
The Application of Cluster Analysis to Trace Elemental Concentrations in Geological and Biological Matrices. <i>Earl W. Stromberg and James L. Fasching</i> .....	151
Individual Variation of Trace Metal Content in Fish <i>John R. Montgomery, Seppo E. Kolehmainen, Mario D. Banus, B. Joan Bendien, James L. Donaldson, and José A. Ramirez</i> .....	163
Accuracy of Chemical Analysis of Airborne Particulates. Results of an Intercomparison Exercise <i>Francesco Girardi</i> .....	173
The Estimation of Accuracy in Trace Analysis. Results Obtained from Intercomparisons Organized by the IAEA. <i>Ludwik Górski, J. Heinonen, and O. Suschny</i> .....	189
Accuracy Assurance in the Analysis of Environmental Samples <i>R. K. Skogerboe and S. R. Koirtyohann</i> .....	199
Four Laboratory Comparative Instrumental Nuclear Analysis of the NBS Coal and Fly Ash Standard Reference Materials <i>John M. Ondov, William H. Zoller, I. Olmez, N. K. Aras, Glenn E. Gordon, L. A. Rancirelli, K. H. Abel, R. H. Filby, K. R. Shah, and R. C. Ragaini</i> .....	211
Trace Element Studies of a Selected Portion of the Mahoning River System <i>I. Mahadeviah, E. Mooney, and R. Munteau</i> .....	225

CONTENTS

IX

	Page
Analysis of 11 Elements in Biological Material. Comparison of Neutron Activation Analysis and Atomic Absorption <b>Analysis</b> <i>H. Wesch and A. Bindl</i> .....	231
Determination of <b>Zinc</b> in Environmental <b>Matrices</b> : A Comparison of Results <b>Ob-</b> <b>tained</b> by Independent <b>Methods</b> <i>Mario Gallorini and Edoardo Owini</i> .....	239
Reliability of Trace <b>Metal</b> Determination in Freshwater by <b>Flameless</b> Atomic <b>Ab-</b> <b>sorption</b> (Graphite <b>Tube</b> Atomization) in Comparison with Other Chemical and Physical Methods <i>R. Wagemann</i> .....	247
The Preparation and Certification of Trace Mercury in Water Standard Reference <b>Materials</b> <i>John R. Moody, Paul J. Paulsen, Theodore C. Rains, and Harry L. Rook</i> .....	267
The Influence of Limits of Laboratory Accuracy and Precision on the <b>Interpretation</b> of Blood Lead Analyses for Industrial Lead Hygiene Control <i>Alfred C. Eckert, Jr.</i> .....	275

**Part II. SAMPLING**

Sampling and Sample Preparation at the Geological Survey of Canada—The What, Why, and How <i>John A. Maxwell</i> .....	285
Sampling of Biological Materials <i>A. Speecke, J. Hoste, and J. Versieck</i> .....	299
Accuracy in <b>Air</b> Sampling <i>James P. Lodge, Jr.</i> .....	311
The Reduction of <b>Orders</b> of Magnitude Errors in Lead Analyses of Biological Materials and Natural <b>Waters</b> by Evaluating and Controlling the Extent and Sources of Industrial Lead Contamination Introduced During Sample Col- lecting and Analysis <i>Clair C. Patterson and Dorothy M. Settle</i> .....	321
Sampling for Clinical Chemistry <i>Frank A. Ibbott</i> .....	353
High-Purity Reagents for Ultratrace Analysis <i>Morris Zief and Joseph Horvath</i> .....	363
Contamination of Atmospheric Particulate Matter Collected at Remote Shipboard and Island Locations <i>Eva J. Hoffman, Gerald L. Hoffman, and Robert A. Duce</i> .....	377
Sampling and Analysis for Sulfur Compounds in Automobile Exhaust <i>E. R. Blosser, L. J. Hillenbrand, J. Lathouse, W. R. Pierson, and J. W. Butler</i> ..	389
Reparation, Analysis, and Sampling Constants for a Biotite <i>C. O. Ingamells and J. C. Engels</i> .....	401
An Approximate Method of Computing Errors in Trace Analysis Due to Sampling Heterogeneous Solids <i>F. J. Flanagan</i> .....	421
Sampling and Analysis of Carbon Contained in the Primary Coolant of Pressurized Water Reactors <i>Sterling A. Meacham</i> .....	429
Sampling and Sample Handling for Activation Analysis of River Water <i>Sally H. Harrison, Philip D. LaFleur, and William Zoller</i> .....	439
Homogeneity Considerations in Trace Analyses Using the Nuclear Track Technique <i>B. Stephen Carpenter and G. Michael Reimer</i> .....	457

## Part III. SAMPLE HANDLING

	Page
<b>Problems</b> in Sample Treatment in Trace Analysis	
<i>Claude W. Sill</i> .....	463
<b>Dissolution</b> of Organic Materials	
<i>T. T. Gorsuch</i> .....	491
The Role of the <b>Analytical Blank</b> in Accurate Trace Analysis	
<i>Thomas J. Murphy</i> .....	509
The Analysis of Surfaces and <b>Microstructural</b> Detail	
<i>F. Bacon and E. Lifshin</i> .....	541
The Effects of Container Composition; Storage Duration, and Temperature on Serum Mineral Levels	
<i>Gerald L. Fisher, L. G. Davies, and L. S. Rosenblatt</i> .....	575
Biological Sample Contamination Due to Quartz Container in Neutron Activation Analysis	
<i>B. Maziere, A. Gaudry, I. Gros, and D. Comar</i> .....	593
Preparation of Biological Materials for Chromium Analysis	
<i>Wayne R. Wolf and F. Ella Greene</i> .....	605
Stability of Chromium Ions at Low Concentrations in Aqueous and Biological Matrices Stored in Glass, Polyethylene, and <b>Polycarbonate</b> Containers	
<i>Vir D. Anand and Donald M. Ducharme</i> .....	611
A Possibility of State Analysis by Plasma Spectrometry	
<i>Shigeki Hanamura</i> .....	621
Reparation and Analysis of Aquatic-Related Samples	
<i>N. M. Ferguson, I. R. Lund, R. R. Rickard, and L. T. Corbin</i> .....	627
Stability of Metal Ions in Aqueous Environmental Samples	
<i>Anthony Rattionetti</i> .....	633
Resin-Loaded Papers—Sampling and Trace Analysis Using Neutron Activation and X-Ray Spectrography	
<i>Stephen L. Law and William I. Campbell</i> .....	649

## VOLUME II

## Part III. SAMPLE HANDLING—Cont.

<b>Losses</b> , Interferences, and Contamination in Trace Metal Analysis—Some Examples	
<i>Francis I. Amore</i> .....	661
Sampling Problems and the Determination of Mercury in Surfacewater, Seawater, and Air	
<i>H. A. Das and H. A. van der Sloot</i> .....	669
Control of <b>Blanks</b> in the Analysis of Phthalates in Air and <b>Ocean</b> Biota Samples	
<i>C. S. Giam and H. S. Chan</i> .....	701
Mass Spectrometric Analysis for Fractional ppb Atomic Content of Boron in <b>Trichlorosilane</b>	
<i>John A. Baker</i> .....	709
The Challenge of Getting the Lead Out	
<i>Eleanor Berman</i> .....	715
Rapid Homogenization and Drying of Biological Material	
<i>Ivan Yordanov Donev</i> .....	721

## CONTENTS

XI

	Page
Problems in Trace Analysis of <b>Nitrosamines</b> in Foodstuffs <i>E. A. Walker and M. Castegnaro</i> .....	727
<b>Effects</b> of Storage Conditions on Residues of 2,4-D and 2,4-DCP in Potatoes <i>Douglas Bristle</i> .....	737
Sampling Problems in the Investigation of High Purity Metals <i>M. Radwan, L. Walis, and H. Jaskdska</i> .....	747

## Part IV. ANALYSIS

Analytical Methodology for Accurate Determination of Trace Constituents in Highly Pure Materials <i>Philippe Albert</i> .....	759
Analytical Methodology—Rocks and Ores <i>Hiroshi Onishi</i> .....	773
The Past, Present, and Future of the Analysis of Atmospheric Particulates <i>R. K. Skogerboe</i> .....	791
Analytical Chemistry of Natural Waters <i>D. E. Robertson</i> .....	805
Analytical Methodology for Accurate Analysis in Clinical Chemistry <i>S. S. Brown and F. L. Mitchell</i> .....	837
Trace Level Determination of <b>Triclosan</b> by Gas Chromatography <i>Fritz-Hans Marquardt, Janos Schulze, and Don Smith</i> .....	851
Electrochemical Trace Analyses Based on Faraday's Law <i>D. J. Curran</i> .....	861
The <b>Non-Faradaic</b> Background in Pulse Polarography <i>Robert A. Osteryoung and Joseph H. Christie</i> .....	871
Improved Anodic Stripping Voltammetry for Accurate Trace Analysis <i>Magda Ariel and Joseph Wang</i> .....	881
Monitoring Dissolved Copper in Seawater by Means of Ion-Selective Electrodes <i>Gary K. Rice and Raymond J. Jasinski</i> .....	899
<b>Electroanalytical</b> Determination and <b>Characterization</b> of Some Heavy Metals in Seawater <i>M. Branica, L. Sipos, S. Bubic, and S. Kozar</i> .....	917
The Accurate Determination of Lead in Biological and Environmental Samples by Isotope Dilution Mass Spectrometry <i>Lawrence A. Machlan, John W. Gramlich, Thomas J. Murphy, and I. Lynus Barnes</i> .....	929
Rare Earth Element Analysis by Isotope Dilution <i>Gilbert N. Hanson</i> .....	937
An Accurate Determination of Electrolyte Concentrations in Blood Serum by Isotope Dilution Mass Spectrometry <i>Ernest L. Garner, Lawrence A. Machlan, John W. Gramlich, Larry J. Moore, Thomas J. Murphy, and I. Lynus Barnes</i> .....	951
Spiking Isotope Dilution and Its Application to Fluorine Determinations <i>H. A. Das and T. Wals</i> .....	961
The Determination of Small Amounts of Nitrogen (0 to 20 ppm) in Plain Carbon Steels <i>H. F. Pronk</i> .....	983
Trace Element Analysis of Nickel and Nickel-Base Alloys—A Review of Current Methods <i>C. Manning Davis</i> .....	1005

	Page
Nonuniform Distribution (Both Micro and Macro) of Trace Elements in High-Temperature Alloys <i>Owen H. Kriege and Jerry Y. Marks</i> .....	1017
Monitoring of an Atomic Absorption Spectrophotometer Using Cumulative Sum Statistical Control <b>Charts</b> <i>John R. Montgomery</i> .....	1023
Signal Characterization and Measurement in Microsample Atomic Absorption Spectrometry <i>Raymond S. Vogel and Arnold M. Hartley</i> .....	1035
An Intercomparison of Flame and <b>Nonflame</b> Systems in Atomic Absorption Spectrometry <i>Theodore C. Rains and Oscar Menis</i> .....	1045
Atomic Absorption Spectrophotometry of Air Filter Paper Tape Samples <i>Fausto J. Munoz-Ribadeneira, Maria L. Nazario, and Alice Vega</i> .....	1053
Analysis of Cadmium in Fish Tissue by <b>Flameless</b> Atomic Absorption with a Tantalum Ribbon <i>E. R. Blood and G. C. Grant</i> .....	1063
Methodology Considerations in Western Lake Superior Water-Sediment Exchange Studies of Some Trace Elements <i>John E. Poldoski and G. E. Glass</i> .....	1073
Accuracy in Determining Trace Element Concentration in Marine Sediments <i>Edward D. Wood and Nelson Acosta Cintron</i> .....	1089
Significant Improvement of Accuracy and Precision in the Determination of Trace Rare Earths by Fluorescence Analysis <i>Lyuji Ozawa and Herbert N. Hersh</i> .....	1103
The Advantages of X-Ray Fluorescence Analysis for Trace Elements in Silicate Rocks <i>Bernard M. Gunn</i> .....	1109
Monitoring of Smog Aerosols with Elemental Analysis by Accelerator Beams <i>T. A. Cahill, R. G. Flocchini, R. A. Eldred, P. J. Feeney, S. Lunge, D. Shadoan, and G. Wolfe</i> .....	1119
Characteristics of Environmental Airborne Fissionable Material <i>Bruce M. Center, Kurt E. Jackson, and F. H. Ruddy</i> .....	1137
Analytical Design in Activation Analysis: The Role of Accuracy and Precision <i>Donald A. Becker</i> .....	1143
A Search for Accuracy in Activation Analysis of Trace Elements in Different Matrices <i>Sandro Meloni, Maria T. Ganzerli-Valentini, Vera Caramella-Crespi, Vera Maxia, Luigino Maggi, Ugo Pisani, Renato Soma, and Pierangelo Borroni</i> .....	1157
Surface Effects on Accuracy in Activation Analysis <i>G. Revel and M. Fedoroff</i> .....	1165
A Study into the Accuracy of a Remote-Controlled System for Multielement Determination in Foodstuffs Using NAA <i>Rieder Schelenz and Johannes-Friedrich Diehl</i> .....	1173
Neutron Activation Analysis of Elements Extracted into Organic Media <i>Renato Stella and Nicla Genova</i> .....	1181
Estimation of Primary Reaction Interferences in Fast Particle Activation Analysis by Calculations Using Cross Section Data <i>Viliam Krivan</i> .....	1189
Activation Analysis with Charged Particles of Intermediate Energy: Performances and Applications <i>J. N. Barrandon and J. L. Debrun</i> .....	1215

CONTENTS

XIII

	Page
Organomercury and Total Mercury Content of Environmental Matrices as Determined by Neutron Activation Analysis <i>Edoardo Orvini and Mario Gallorini</i> .....	1233
Evaluation of Error in the Instrumental Activation Analysis of Rocks <i>Rolf J. Rosenberg</i> .....	1241
Neutron Activation Analysis for Some <b>Nonstoichiometric</b> Constituents in a Large Number of Natural and Synthetic Beryl Samples <i>Slobodan M. Ristic</i> .....	1257
Control of Sample Configuration as an Aid to Accuracy in Instrumental Neutron Activation Analysis <i>Robert E. Heft</i> .....	1275
<b>Observations</b> on the Quantitative Electron Probe Microanalysis of Particles <i>C. E. Fiori, K. F. J. Heinrich, R. L. Myklebus, and M. M. Darr</i> .....	1283
Determination of Elements in Standard Material (Bovine Liver SRM 1577) <i>I. Y. Donev and L. M. Marichkova</i> .....	1293