CONTENTS

X-Ray Spectroscopy

Soft and Very Soft Fluorescence Analysis: Spectro- graphic and Electronic Modifications for Optimum, Automated Results	
A. K. Baird, D. B. McIntyre, and E. E. Welday	3
The Soft X-Ray Emission Band Spectra of Metals and Alloys	
Dr. Brian J. Thompson and Paul F. Kellen	23
Demountable X-Ray Tube for Light Element Fluores- cence Analysis	
J. A. Dunne and W. R. Muller	33
Relationship Between X-Ray Tube Target Materials and X-Ray Emission Intensities	
F. Bernstein	45
Applications of Chemical Precipitation Methods for Im- proving Sensitivity in X-Ray Fluorescent Analysis	
Joseph S. Rudolph, Owen H. Kriege, and Robert J. Nadalin	57
X-Ray Spectrochemical Determination of Niobium and Tantalum in High-Alloy and Stainless Steel	C E
Roger W. Taylor	65
Influence of the Origin of Raw Materials on the X-Ray Analysis of Cements	0.9
H. T. Dryer and H. Renton	83
Scanning Electron-Probe Techniques for Diverse Non- metallurgical, Industrial Applications	
T. E. Reichard and W. S. Coakley	91
Approximations for the Interpretations of X-Ray K Absorption Spectra	
George R. Mitchell.	109
vii	

Infrared and Raman Spectroscopy

Construction and Performance of Highly-Efficient Micro Gas Cells for the Infrared Spectra K. E. Stine, D. E. McCarthy, and H. J. Sloane	121
Electronic Phase Null Photometric System of the Series 2000 Infrared Spectrophotometer Charles W. Warren and Albert W. Chapple	133
The Identification of Fibers and Fabrics by Internal Reflection Spectroscopy Paul A. Wilks, Jr., and Mayhew R. Iszard	141
Multicomponent Infrared Analysis by the Absorbance Ratio Method Arthur S. Wexler	151
Sensitivity of Calculated Wave Numbers of a Normal Coordinate Treatment to Assumed Molecu- lar Geometry Robert R. Hart	171
Vibrational Spectra of C ₁₀ Cl ₁₂ and C ₁₀ Cl ₁₀ O S. Sundaram	179
Spectroscopic Study of the Molecular Complex HMX: DMF Alex Castelli and Delbert J. Cragle	187
Intramolecular NH···Halogen Hydrogen-Bond Strengths in Five- and Six-Membered Chelate Rings	
P. J. Krueger and D. W. Smith	197

Ultraviolet and Visible Spectroscopy

A New Molybdenum-Blue Method for Silicon in Steel Uno T. Hill	215
Theory and Applications of Diffuse Reflectance Spec-	
troscopy Audrey L. Companion	221
Adaptation of an Inexpensive Ultraviolet-Visible Spec- trophotometer for Enzyme Kinetic Work	
David L. Heyse	235

CONTENTS	
----------	--

Investigation of Cathodo-Luminescence with the Petro-	
graphic Microscope	
Paul Weiblen	245

ix

Gas Chromatography

The Detection of Submicrogram Quantities of Carcino- genic Polynuclear Hydrocarbons Using Electron Capture William Lijinsky and Irving Domsky	255
Chromatographic Analysis of Evolved Contaminants From Spacecraft Materials Normal T. Gonnella	265
A Novel Method for Collecting Samples for Infrared Identification Lillian Churchill	283
Determination of Traces of Glycols by Gas Chromatog- raphy Abram Davis, Arthur Roaldi, and Lewis E. Tufts	289
Gas Chromatographic Analysis of Alpha-Hydroxy Car- boxylic Acids	
Norman E. Hoffman and Peter J. Conigliaro The Direct Gas Chromatographic Determination of Low Molecular Weight Fatty Acids in Rumen Fluid J. B. Martin, Jr.	299 313
Simultaneous Gas Chromatography and Radioactivity Analysis: Instrumentation, Calibration, and Application	
D.C. Nelson, R.C. Hawes, D. Paull, and P.C. Ressler, Jr	323
An Inexpensive, Dual-Detector Gas Chromatograph Suit- able for Temperature Programming John A. Perry	347
A New Method of Pyrolysis Theron Johns and Robert A. Morris	361
Gas Chromatographic Determination of Total Oxygen in Organic Materials F. L. Boys and D. D. Dworak	369

Gas	Chromatographic Methods for the Detailed Study of	
	Controlled-Temperature Polymer Degra-	
	dation	
	Robert T. Conley	377

NMR Spectroscopy

NMR-Fun	Chemistry	ÿ							
C. L.	McGehee	and C. H.	Summers	 ••	••	••	•••	•	405

Emission, Flame, and Atomic Absorption Spectroscopy

Extraction and Flame Spectrophotometric Determina- tion of Palladium and Rhodium	
Howard C. Eshelman, John Dyer, and James Armentor	419
The Determination of Copper, Nickel, Cobalt, Manga- nese, and Magnesium in Irons and Steels by Atomic Absorption Spectrophotometry	
Sabina Sprague and Walter Slavin	433
Developments in Flame Emission and Flame Absorption Photometry	
John A. Dean	443
The Future of Atomic Absorption Spectroscopy J. W. Robinson	455
A Plasma-Arc Technique for the Spectrochemical Determination of Titanium and Zirconium in Molybdenum	
James H. Muntz	461
The Performance of the Interrupted Discharge in Argon H. T. Dryer and F. Borile	469
Spark Excitation in Inert Atmospheres Arno Arrak	48 1
The Interferometric Control System of the Diffraction Product's Ruling Engine	
Edward Leibhardt and John DuBois	495

х

CONTENTS

Transformation Functions for Photographic Response in Spectrography J. M. McCrea	501
Spectrographic Determination of Rhenium in Molybdenite with the DC Arc	
W. G. Schrenk and Show-jy Ho	517
The Determination of Boron in Metal Particles Using the Copper Fluoride Evaluation TechniqueM. E. Waitlevertch, Jr., K. W. Guardipee, J. E. Paterson, and A. L. Wolfe	527
The Influence of the Thermal Conductivity of Electrodes on the Spectrochemical Analysis of Small Samples and Trace Concentrations	
F. J. Haftka	533