

CONTENTS

<i>Preface</i>	v
<i>Contributors to this Volume</i>	vii
1. Information and Spectra	1
EDWARD J. GAUSS	
I. Stochastic Processes	1
II. Classification of Stochastic Processes	3
III. Correlation	3
IV. Transforms	7
V. Line and Band Spectra	12
VI. The Units of Spectral Analysis	12
VII. Noise and Signals	13
VIII. Information Content	13
IX. Filters and Transfer Functions	16
X. Bode's Approximations	17
XI. Swept-Filter Analysers	20
XII. Other Devices	23
XIII. The Selectivity-Record Length Limitation	25
XIV. The Problem of Sampling	28
XV. Photographing a Stagecoach	28
XVI. Aliasing	30
XVII. List of Symbols	32
References	32
2. Spectrum Analysis	35
JAMES A. BLACKBURN	
I. Introduction	35
II. Least-Square Techniques	37

III. Weighting Functions	45
IV. Fourier Analysis	55
References	66
3. Numerical Filtering	67
J. F. A. ORMSBY	
I. Introduction	67
II. Data Characteristics and Processing	70
III. Basic Filtering and Sampling Concepts	76
IV. Numerical Filter Formulation	78
V. Filter Design	90
VI. Other Filters and Applications	106
References	119
4. A Numerical Least-Square Method for Resolving Complex Pulse-Height Spectra	121
J. I. TROMBKA AND R. L. SCHMADEBECK	
I. Formulation of the Least-Square Principle	121
II. Calculation of Errors	125
III. Correlation, Resolution, and Background Compensation	138
IV. Outline of the Computer Program and an Application of the Least-Square Technique	143
V. Summary	168
References	170
5. Biological Applications	171
R. D. B. FRASER AND E. SUZUKI	
I. Introduction	171
II. Theory of Method	172
III. The Iteration Process	187
IV. Computational Procedure	193
V. Applications	198
References	211
6. Activation Analysis	213
FELIX J. KERRIGAN	
I. Introduction	213
II. Gamma Decay Spectra	214

CONTENTS	xi
III. Mathematical Procedures	217
IV. Typical Analysis Utilizing Linear Programming	221
V. Quantitative and Qualitative Capabilities	222
VI. Simplex Tableau	225
VII. Controlling the Spectrum Data and Computations	232
References	233
7. Mass Spectrometry	235
JOHN I. BRAUMAN	
I. Introduction: Mass Spectrometry	235
II. Problem: Molecules Containing Atoms with Several Isotopes	237
III. Formal Analysis	239
IV. Applications	242
V. An Example: Germacyclopentane	252
VI. Other Applications	255
VII. Computations	256
References	257
8. Gamma-Ray Spectroscopy	259
J. I. TROMBKA	
I. Introduction	259
II. Properties of Scintillation-Detector Systems	261
III. Properties of Pulse-Height Spectra	271
References	281
<i>Author Index</i>	283
<i>Subject Index</i>	287