



# Contents

<i>List of Contributors</i>	vii
<i>Contents of Volume I</i>	viii
<i>Preface</i>	ix

## 1 Inner-Shell Transition Measurements with Radioactive Atoms

*P. Venugopala Rao*

1.1. Introduction	2
1.2. Fluorescence, Auger, and Coster-Kronig Yields	2
1.3. Decay of Double Inner-Shell Vacancy States	18
1.4. Auger-Electron Intensities	23
1.5. Relative x-Ray Intensities	25
1.6. Measurement of Widths	27
1.7. Directional Correlations	28
References	30

## 2 Electron Spectrometry

*M. O. Krause*

2.1. Introduction	34
2.2. Instrumentation	36
2.3. Some Basic and Operational Principles	43
2.4. Photoelectron Spectrometry	51
2.5. Auger-Electron Spectrometry	65
2.6. The All-Electron Experiment	73
2.7. Miscellaneous	76
References	77

## 3 x-Ray Diffraction Spectrometry

*Y. Cauchois and C. Bonnelle*

3.1. Introduction	84
3.2. Types of x-Ray Spectrometers	87
3.3. General Characteristics of Crystal Spectrometers	94

3.4. Diffraction by a Plane Crystal	96
3.5. Instrumental Effects in Two-Crystal Spectrometers	103
3.6. Instrumental Effects in Bent-Crystal Spectrometers	110
References	118

## 4 Spectrometry with Solid-State Detectors

*G. Bertolini and G. Restelli*

4.1. Introduction	124
4.2. Basic Characteristics of x-Ray and Electron Spectrometers	125
4.3. x-Ray Spectrometers	150
4.4. Electron Spectrometers	157
4.5. Concluding Remarks	161
References	163

## 5 Proportional-Counter Spectrometry

*R. W. Fink*

5.1. Introduction	169
5.2. Gas Multiplication	171
5.3. Energy Resolution	173
5.4. Risetime and Pulse Shape	174
5.5. Wall Effects	175
5.6. Spurious Counts and Afterpulses	176
5.7. Single-Electron Spectrometry	176
5.8. Spectrometry of Few-Electron Events	177
5.9. Position-Sensitive Proportional Counters	179
5.10. Proportional Counters with Special Innovations and Applications	180
5.11. Conclusion	183
References	184

## 6 Some Practical Applications of Inner-Shell Ionization Phenomena

*Theodore E. Bunch, Lawrence J. Caroff, and Hans Mark*

6.1. Introduction	187
6.2. x-Ray Fluorescence Analysis	189
6.3. Astrophysical Applications	198
References	202

*Author Index*

205

*Subject Index*

216