

Contents

| | |
|------------------------|-----|
| Contributors | v |
| Preface | vii |

1. Applications of Auger Spectroscopy in Materials Analysis

G. E. McGuire and P. H. Holloway

| | |
|-----------------------------|----|
| I. Introduction | 2 |
| II. Fundamentals | 3 |
| III. Applications | 16 |
| IV. Conclusion | 74 |
| References. | 74 |

2. High Resolution Auger Spectroscopy of Solids and Surfaces

J. C. Fuggle

| | |
|---|-----|
| I. Introduction | 86 |
| II. Experimental Measurement of Auger Spectra | 87 |
| III. Some Basic Concepts and Differences between XAES and EAES | 90 |
| IV. Core Level Studies | 114 |
| V. Case Studies and Valence Band Effects in Pure Elements | 123 |
| VI. Valence Band Studies of Compounds | 134 |
| VII. Concluding Remarks | 144 |
| Acknowledgements | 144 |
| References. | 145 |

3. Symmetry and the Electron Spectroscopy of Surfaces

N. V. Richardson and A. M. Bradshaw

| | |
|--|-----|
| I. Introduction | 153 |
| II. General Symmetry Considerations | 155 |
| III. Electron Energy Loss Spectroscopy | 163 |
| IV. Valence Level Photoelectron Spectroscopy | 173 |
| V. Conclusions | 193 |
| References. | 193 |

4. The Use of Synchrotron Radiation to Study Oxygen and Metal Overlayers on GaAs (110) Surfaces

I. Lindau and W. E. Spicer

| | |
|---|-----|
| I. Introduction | 198 |
| II. The Surface Electronic Structure of the Clean GaAs (110) Surface | 199 |
| III. Oxygen Chemisorption and the Initial Stages of Oxidation | 210 |
| IV. Metal Overlayers and the Formation of Schottky Barriers | 234 |
| V. Oxygen Adsorption on Surfaces Covered with Thin Al and Cs Overlayers | 261 |
| VI. Defect States Model for Schottky Barrier Formation | 266 |
| VII. Concluding Remarks | 269 |
| Acknowledgement | 271 |
| References. | 271 |

5. X-ray Photoelectron Spectroscopy for the Investigation of Polymeric Materials

A. Dilks

| | |
|--|-----|
| I. Introduction | 278 |
| II. Absolute and Relative Binding Energies | 279 |
| III. Signal Intensities | 296 |
| IV. Shake-up Phenomena | 312 |
| V. Sample Charging Phenomena | 319 |
| VI. Crosslinked Polymers | 332 |
| VII. Surface Modification of Polymers | 340 |
| Acknowledgements | 356 |
| References. | 356 |

**6. Photoelectron Angular Distributions and Photoionization
Cross Sections in the Vacuum Ultraviolet***James A. R. Samson*

| | |
|---|-----|
| I. Introduction | 361 |
| II. Absolute Cross Section Measurements | 362 |
| III. Angular Distributions | 380 |
| References. | 393 |
| Index | 397 |