

# CONTENTS

Preface ix

Contributors xiii

## GENERAL INTRODUCTION

1. *Roman I. Personov*  
The Historical Development of High-Resolution Selective Spectroscopy of Organic Molecules in Solids

## CRYSTALLINE MATRICES

### *Fundamental Aspects*

2. *Indrek Renge and Urs P. Wild*  
Principles of Matrix-Induced High-Resolution Optical Spectroscopy and Electron-Phonon Coupling in Doped Organic Crystals 19
3. *Michel Lamotte*  
Trapping of PAHs in Shpol'skii Matrices: Orientation and Distortion 73

### *Environmental and Bioanalytical Chemistry*

4. *Maximilian Zander*  
Luminescence Spectroscopy of Large Polycyclic Aromatic Hydrocarbons 115
5. *Igor S. Kozin and Sadao Matsuzawa*  
In-Ring and At-Ring Heterosubstituted Polyaromatic Compounds 153
6. *Freek Ariese*  
Shpol'skii Spectroscopic Analysis of PAH Metabolites 181

## CONTENTS

### *Chemical Physics*

7. *Eva Migirdicyan, Olivier Parisel, and Gaston Berthier*  
Aromatic Biradicals and Carbenes: High Resolution Electronic  
Spectra and their Quantum-Chemical Interpretation 201

## **AMORPHOUS MATRICES**

### *Fundamental Aspects*

8. *Ryszard Jankowiak*  
Fundamental Aspects of Fluorescence Line-Narrowing  
Spectroscopy 235
9. *Tijshert M. H. Creemers and Silvia Völker*  
Dynamics of Glasses and Proteins Probed by Time-Resolved  
Hole Burning 273

### *Environmental and Bioanalytical Chemistry*

10. *Cees Gooijer and Steven J. Kok*  
Coupling of Fluorescence Line-Narrowing Spectroscopy and  
Liquid Separation Techniques 307
11. *Freek Ariese and Ryszard Jankowiak*  
High-Resolution Fluorescence Analysis of Polycyclic Aromatic  
Hydrocarbon Derived Adducts to DNA and Proteins 333
12. *Jane M. Vanderkooi*  
Beyond Structure: Fluorescence Line-Narrowing Spectroscopy  
Used to Study Proteins 363
13. *Margus Ratsep and Gerald J. Small*  
High-Pressure and Stark Hole-Burning Studies of  
Photosynthetic Complexes 381

### *Chemical Physics*

14. *Stephan J. Zilker and Dietrich Haarer*  
Site-Selective Spectroscopy of Amorphous Polymers 409
15. *Philippe Tamarat, Fedor Jelezko, Brahim Lounis, and Michel Orrit*  
Spectroscopy of Single Molecules in Solid Matrices  
at Cryogenic Temperatures 435
16. *Johannes W. Hojstraat and Urs P. Wild*  
High-Resolution Luminescence Excitation–Emission Matrices 463
17. *Keith M. Murdoch and John C. Wright*  
Site-Selective Laser Spectroscopy of Defects in Inorganic Materials 503
- 543