



# Contents

Contributors	v
Preface	vii

## 1. Conformational Analysis by Photoelectron Spectroscopy

R. S. Brown and F. S. Jørgensen

I. Introduction	2
II. n-n conjugation	6
III. $\pi$ - $\pi$ conjugation	56
IV. n- $\pi$ conjugation	66
V. Interactions involving $\sigma$ conjugation	82
VI. Concluding remarks	100
Addendum	111
Acknowledgements	115
References	115

## 2. Photoelectron Emission Spectroscopy of Liquids and Solutions

Paul Delahay

Introduction	124
<i>Part I. Photoelectron Emission Spectra</i>	
I. Experimental methods	127
II. The three-step model	131
III. Theory of photoelectron emission in the threshold approximation	135
IV. Energetics of photoelectron emission	142
V. Threshold energies and their interpretation	149
VI. Correlation between emission and optical charge transfer spectra	155
VII. Correlation between optical and thermal electron transfer	158
VIII. Photon-induced electron transfer	160
<i>Part II. Energy Distribution Curves</i>	
I. Experimental methods	165
II. Theory of energy distribution curves	169
III. Application to solvated electron solutions	178
IV. Emission via autoionization of organic anion radicals in solution	185
V. Liquid vs. gas phase photoionization energies for non-aqueous solvents	189

Conclusion	192
Acknowledgement	192
References	192

### **3. Penning Ionization and Related Processes**

Andrew J. Yench

I. Introduction	198
II. Theoretical model of Penning ionization	205
III. Angular scattering studies	211
IV. Cross section and rate constant determinations	227
V. Penning ionization electron spectroscopy	284
VI. Penning ionization optical spectroscopy	344
VII. Concluding remarks	352
Acknowledgements	354
References	355
<b>Index</b>	<b>375</b>