

CONTENTS

1. INSTRUMENTATION AND PRESENTATION OF MASS SPECTRA	
1.1. Introduction	1
1.2. Ion sources	1
1.3. Mass analysers. Types of mass spectrometer	3
1.4. Inlet systems	11
1.5. Ion detectors and recording of mass spectra	12
1.6. Resolution	13
1.7. Processing and presentation of mass spectra	14
References	17
2. FUNDAMENTAL ASPECTS OF THE MASS SPECTROMETRY OF METAL COMPOUNDS	
2.1. Processes which occur in the mass spectrometer and types of ions arising from them	19
2.2. Isotope patterns	33
2.3. Thermal, instrumental and hydrolytic effects	37
2.4. Applications	39
References	40
3. FRAGMENTATION OF METAL-CONTAINING IONS	
3.1. Introduction	45
3.2. Ionisation potentials of products	46
3.3. Product stabilities	46
3.4. Fragmentation patterns of σ -bonded compounds	48
3.5. Fragmentation patterns of π -bonded compounds	52
3.6. Relative bond stabilities	54
3.7. Rearrangement processes	56
References	59
4. ENERGETICS OF MOLECULAR IONISATION AND DISSOCIATION	
4.1. Scope and definitions	61
4.2. Ionisation by electron impact	62
4.3. Ionisation efficiency curves for the formation of positive ions	64
4.4. Experimental methods of determination of ionisation and appearance potentials	67
4.5. Ionisation efficiency curves for the formation of negative ions	80
4.6. Determination of thermochemical data	83
5 MAIN GROUP ORGANOMETALLIC AND METAL-METAL BONDED COMPOUNDS	
5.1. Introduction	87
5.2. Influence of spectrometer operating conditions on mass spectra	89
5.3. Fragmentation behaviour of main group organometallic compounds	98

5.4. Fragmentation behaviour of metal-metal bonded compounds	101
5.5. Structure determination	101
References	102
6. BORON COMPOUNDS	
6.1. Introduction	105
6.2. Compounds containing boron-hydrogen bonds	105
6.3. Compounds containing boron-carbon bonds	106
6.4. Compounds containing boron-nitrogen bonds	106
6.5. Compounds containing boron-oxygen bonds	108
6.6. Compounds containing boron-sulphur bonds	110
References	110
7. POLYNUCLEAR CARBONYLS AND RELATED DERIVATIVES	
7.1. Introduction	113
7.2. Polynuclear carbonyls	114
7.3. Nitrosyl complexes	120
7.4. Bond dissociation energies	122
References	124
8. TRANSITION METAL HYDROCARBON COMPOUNDS	
8.1. Introduction	127
8.2. Ionisation and charge localisation	127
8.3. The fragmentation of transition metal hydrocarbon complexes	129
References	145
9. COORDINATION COMPOUNDS	
9.1. Introduction	147
9.2. Energetic studies by electron impact methods	148
9.3. Mass spectra of metal complexes	189
Addendum	247
References	247
10. ANALYTICAL ASPECTS OF THE MASS SPECTROMETRY OF METAL CHELATES	
10.1. Introduction	255
10.2. Quantitative analysis of metal chelates using mass spectrometry	258
10.3. Reactions of metal chelates in the ion source	267
10.4 Applications	270
References	281
APPENDIX	283
INDEX	291