

# Contents

<i>Preface</i>	vii
<i>Introduction</i>	ix
<i>List of Abbreviations, Acronyms and Symbols</i>	xi
<b>1 Fundamentals</b>	<b>1</b>
1.1 Multilinear and Nonlinear Regression Analyses	1
1.2 Stepwise Regression Analysis and Partial Least Squares Method	2
1.3 Two- and Three-dimensional Principal Component Analysis, Various Factor Analytical Techniques	2
1.4 Canonical Correlation Analysis	4
1.5 Discriminant Analysis	4
1.6 Spectral Mapping	5
1.7 Nonlinear Mapping	5
1.8 Cluster Analysis	5
1.9 Other Multivariate Techniques	5
1.10 Measured and Calculated Physicochemical Parameters of Chromatographic Systems and Analytes References	6 7
<b>2 Gas Chromatography</b>	<b>9</b>
2.1 Theory and Practice of Gas Chromatography	9
2.2 Comparison of Gas Chromatography Stationary Phases Using a Homogenous and Nonhomogenous Set of Analytes	12
2.3 Elucidation of Similarities and Dissimilarities Among Samples	26
2.3.1 Human Health and Pharmaceuticals	28
2.3.2 Forensic Analyses	32
2.3.3 Biology and Agrobiobiology	36
2.3.4 Food and Food Products	46

*vi Contents*

2.3.5	Environmental Analyses	76
2.3.6	Other Synthetic Compounds	97
2.3.7	Miscellaneous Applications	104
	References	107
<b>3</b>	<b>Liquid Chromatography</b>	<b>113</b>
3.1	Thin-layer Chromatography	113
3.1.1	Theory and Practice of Thin-layer Chromatography	113
3.1.2	Multidimensional Classification of Thin-layer Chromatography Stationary and/or Mobile Phases	115
3.1.3	Relationships Between Molecular Parameters and Thin-layer Chromatography Retention of Analytes	117
3.1.4	Relationship Between Thin-layer Chromatography Retention Parameters and Biological Activity of Analytes	136
3.1.5	Miscellaneous Applications	138
3.2	High-performance Liquid Chromatography	140
3.2.1	Theory and Practice of High-performance Liquid Chromatography	141
3.2.2	Multivariate Classification of High-Performance Liquid Chromatography Stationary and/or Mobile Phases	144
3.2.3	Differentiation Between Homologous and Nonhomologous Sets of Analytes	153
	References	256
<b>4</b>	<b>Electrically Driven Systems</b>	<b>265</b>
4.1	Theory and Practice of Electrically Driven Systems	265
4.2	Gel Electrophoretic Techniques	267
4.2.1	Theory and Human Health Aspects	267
4.2.2	Microorganisms	274
4.2.3	Microbial Communities	286
4.2.4	Plant Tissues	298
4.3	Capillary Zone Electrophoresis	300
4.3.1	Human Health and Pharmacology	300
4.3.2	Other Applications	302
4.4	Micellar Electrokinetic Chromatography and Related Technologies	309
	References	315
	<b>Index</b>	<b>325</b>