

Contents

Dedication	V
List of contributors	IX
Introduction.....	XI
1. Electrochemical impedance and related techniques	
• Introduction	
• Electrochemical impedance	
• Conductance measurements	
<i>L. Pospíšil</i>	1
2. Basic principles of voltammetry	
• Introduction	
• Steady-state voltammetry	
• Direct current polarography	
• Pulse polarography and voltammetry	
• Alternating current and square-wave techniques	
• Linear sweep and cyclic voltammetry	
• Electrochemical stripping analysis	
• Hydrodynamic electrode systems	
• Adsorption effects in voltammetry	
<i>O. Fischer and E. Fischerová</i>	41
3. Voltammetric methods for the investigation of chemical kinetics	
• Introduction	
• Basic concepts of reaction coupling	
• Chemical kinetics in steady-state techniques	
• Electrode mechanisms in transient methods	
• Periodic pulse methods and AC polarography in kinetic studies	
• Voltammetric techniques applied to “bulk” chemical kinetics	
• Effect of chemical kinetics on electrode processes <i>in vivo</i>	
<i>O. Fischer and E. Fischerová</i>	159
4. Spectroelectrochemistry	
• Introduction	
• Optically transparent thin-layer electrochemistry (OTTLE)	
• UV-Vis electroreflectance spectroscopy (ER)	

● Surface-enhanced Raman scattering (SERS) ● Nuclear magnetic resonance spectroscopy (NMR) ● Electron spin resonance spectroscopy (ESR)	251
<i>K. Niki, O. Vrána and V. Brabec</i>	
5. Electroanalysis of biomacromolecules	
● Introduction ● Electrosorption ● Electroreduction and electrooxidation	
<i>V. Brabec, V. Vetterl and O. Vrána</i>	
	287
6. Biosensors with electrochemical transducers	
● Introduction ● Short characterization of electrochemical transducers ● Biological elements used for the construction of biosensors ● Membrane biosensors ● Reactor biosensors including FIA systems ● Fields of application of biosensors	
<i>J. Káš, M. Marek, M. Šťastný and R. Volf</i>	
	361
7. <i>In vivo</i> electrochemistry with microelectrodes	
● Introduction ● Microelectrodes ● Voltammetric methods and instrumentation ● <i>In vivo</i> applications	
<i>K. Tanaka and K. Tokuda</i>	
	455
8. Electrophoresis	
● Introduction ● Movement of charged particles in an electric field in solution ● Electrophoresis as a separation method: Efficiency and resolution ● Effects accompanying electrophoresis ● Experimental methods of electrophoresis	
<i>M. Vojtišková</i>	
	489
9. Patch-clamp technique	
● Introduction ● Electronic principles of the path-clamp technique ● Instrumentation ● Patch-clamping ● Patch-clamp experiment examples	
<i>O. Moran</i>	
	527
Index	557