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Electrochemical Systems4.3 Methodology; 4.4 Dynamics; 4.5 Control of Dynamics; 4.6 Toward Applications; 4.7 Summary and Outlook; References; Chapter 5: Fuel Cells: Advances and Challenges; 5.1 Introduction; 5.2 Alkaline and Alkaline Membrane Fuel Cells; 5.3 Polymer Electrolyte Membrane Fuel Cells; 5.4 Phosphoric Acid Fuel Cells and Molten Carbonate Fuel Cells; 5.5 Solid Oxide Fuel Cells; 5.6 Emerging Fuel Cells; 5.7 Applications of Fuel Cells; 5.8 Final Remarks; 5.9 Abbreviations; 5.10 Acknowledgment; References Chapter 6: Electrodes for High-Temperature Electrochemical Cells: Novel Materials and Recent Trends6.1 Introduction; 6.2 General Comments; 6.3 Novel Cathode Materials for Solid Oxide Fuel Cells: Selected Trends and Compositions; 6.4 Oxide and Cermet SOFC Anodes: Relevant Trends; 6.5 Other Fuel Cell Concepts: Single-Chamber, Micro-, and Symmetrical SOFCs; 6.6 Alternative Fuels: Direct Hydrocarbon and Direct Carbon SOFCs; 6.7 Electrode Materials for High-Temperature Fuel Cells with Proton-Conducting Electrolytes 6.8 Electrolyzers, Reactors, and Other Applications Based on Oxygen Ion- and Proton-Conducting Solid Electrolytes6.9 Concluding Remarks; References; Chapter 7: Advances in Fabrication, Characterization, Testing, and Diagnosis of High-Performance Electrodes for PEM Fuel Cells; 7.1 Introduction; 7.2 Advanced Fabrication Methods for High-Performance Electrodes; 7.3 Characterization of PEM Fuel Cell Electrodes; 7.4 Testing and Diagnosis of PEM Fuel Cell Electrodes; 7.5 Final Comments; Acknowledgments; References; Chapter 8: Nanostructured Electrodes for Lithium Ion Batteries; 8.1 Introduction 8.2 Positive Electrodes: Nanoparticles, Nanoarchitectures, and Coatings

Sommario/riassunto

The ideal addition to the companion volume on fundamentals, methodologies, and applications, this second volume combines fundamental information with an overview of the role of ceramic membranes, electrodes and interfaces in this important, interdisciplinary and rapidly developing field. Written primarily for specialists working in solid state electrochemistry, this first comprehensive handbook on the topic focuses on the most important developments over the last decade, as well as the methodological and theoretical aspects and practical applications. This makes the contents equally of inte
