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Nota di contenuto	Power Ultrasound in Electrochemistry; Contents; Foreword; About the Editor; List of Contributors; Acknowledgements; Introduction to Electrochemistry; I.1 Introduction; I.2 Principles of Electrochemistry; I.3 Electron-Transfer Kinetics; I.4 Determination of Overpotentials; I.4.1 Decomposition Voltages; I.4.2 Discharge Potentials; I.5 Electroanalytical Techniques; I.5.1 Voltammetry; I.5.2 Amperometry; References; 1 An Introduction to Sonoelectrochemistry; 1.1 Introduction to Ultrasound and Sonochemistry; 1.2 Applications of Power Ultrasound through Direct Vibrations; 1.2.1 Welding 1.3 Applications of Power Ultrasound through Cavitation1.3.1 Homogeneous Reactions; 1.3.2 Heterogeneous Reactions Involving a Solid/Liquid Interface; 1.3.3 Heterogeneous Liquid/Liquid Reactions;

1.4 Electrochemistry; 1.5 Sonoelectrochemistry - The Application of Ultrasound in Electrochemistry; 1.5.1 Ultrasonic Factors that Influence Sonoelectrochemistry; 1.6 Examples of the Effect of Ultrasound on Electrochemical Processes under Mass Transport Conditions; 1.7 Experimental Methods for Sonoelectrochemistry; 1.7.1 Cell Construction; 1.7.2 Stability of the Electrodes Under Sonication 1.7.3 Some Applications of SonoelectrochemistryReferences; 2 The Use of Electrochemistry as a Tool to Investigate Cavitation Bubble Dynamics; 2.1 Introduction; 2.2 An Overview of Bubble Behaviour; 2.3 Mass Transfer Effects of Cavitation; 2.4 Isolating Single Mechanisms for Mass Transfer Enhancement; 2.5 Electrochemistry Next to a Tethered Permanent Gas Bubble; 2.6 Mass Transfer from Forced Permanent Gas Bubble Oscillation; 2.7 Mass Transfer Effects from Single Inertial Cavitation Bubbles; 2.8 Investigating Non-inertial Cavitation Under an Ultrasonic Horn 2.9 Measuring Individual Erosion Events from Inertial Cavitation2.10 Conclusions; Acknowledgements; References; 3 Sonoelectroanalysis: An Overview; 3.1 Introduction; 3.2 Analysis of Pesticides; 3.3 Quantifying Nitrite; 3.4 Biogeochemistry; 3.5 Quantifying Metal in 'Life or Death' Situations; 3.6 Analysis of Trace Metals in Clinical Samples; 3.7 Biphasic Sonoelectroanalysis; 3.8 Applying Ultrasound into the Field: The Sonotrode; 3.9 Conclusions; References; 4 Sonoelectrochemistry in Environmental Applications; 4.1 Introduction 4.2 Sonoelectrochemical Degradation of Persistent Organic Pollutants4.2.1 Sonoelectrochemical Applications; 4.2.2 Hybrid Sonoelectrochemical Techniques Applications; 4.3 Recovery of Metals and Treatment of Toxic Inorganic Compounds; 4.4 Disinfection of Water by Hypochlorite Generation; 4.5 Soil Remediation; 4.6 Conclusions; List of Symbols and Abbreviations; References; 5 Organic Sonoelectrosynthesis; 5.1 Introduction; 5.2 Scale-Up Considerations; 5.3 Early History of Organic Sonoelectrochemistry; 5.4 Electroorganic Syntheses; 5.4.1 Electroreductions; 5.4.2 Organochalcogenides 5.4.3 Synthetic Electrooxidations

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## Sommario/riassunto

The use of power ultrasound to promote industrial electrochemical processes, or sonoelectrochemistry, was first discovered over 70 years ago, but recently there has been a revived interest in this field. Sonoelectrochemistry is a technology that is safe, cost-effective, environmentally friendly and energy efficient compared to other conventional methods. The book contains chapters on the following topics, contributed from leading researchers in academia and industry: Use of electrochemistry as a tool to investigate Cavitation Bubble Dynamics Sonoelectroanalysis

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