

Contents

Plenary Presentation	1
1. On the constant phase element determination from EIS and cyclic voltammetry experiments.....	2
2. Impedance techniques used in the elaboration of reaction models: a critical discussion	3
3. The EIS of active and coated corrosion systems	4
4. Embedded Impedance Spectroscopy: The Challenge of high performance at limited resources.	5
5. Temperature Dependent EIS Investigation of Batteries with Metallic Lithium Anode	6
6. Electrochemical deposition and characterization of hydroxyapatite-based composite coatings on titanium for biomedical applications.....	7
7. Potential-dependent impedance shapes of electrochemical interfaces	8
8. New in-situ and operando capabilities of Odd Random Phase Electrochemical Impedance Spectroscopy (ORP-EIS) for electrochemical system identification.....	9
9. Electrochemical noise spectroscopy: technique and applications	10
10. 3D Impedance Analyses on Fractal Pore Structures in Localized Corrosion on Copper	11
11. Corrosion Electrochemistry, Surface Film Properties and Scratching Repassivation in High Temperature Pressurised Water for Nuclear Power Plant.....	12
12. Insight into battery processes using a combination of systematic impedance measurements and physics based transmission line modeling	13
13. Integrated Scanning Electrochemical Probes for Imaging Surface inhomogeneities and Localized Corrosion of Metals	14
14. Analyzing Impedance Spectra with the Probabilistic Distribution of Relaxation Times	15
15. Conductive covalent organic polymers directly for oxygen electrode catalysis	16
In the Memory of Mr. Chunan Cao.....	17
1. Design rules of equivalent circuit of corroded electrode based on mixed potential theory and its fitting example	18
2. Corrosion induced hydrogen permeation and environment sensitive fracture of AISI 4135 steel in marine tidal zone	19
3. Effect of Coupling Interaction on Local Corrosion Kinetics of Pure Iron under a Saline Droplet.....	20
4. The application of EIS in the long-term and active corrosion protection of multifunctional coatings	21
5. Research and application of an in-situ detection probe for metal artefacts based on electrochemical impedance technology.....	22
6. Non-stationary electrochemical characteristics of stress corrosion cracking and its application	23
7. Electrochemical Impedance sensor for early failure monitoring of coatings in offshore wind power station	24
8. Study of corrosion of high-strength steel in 3.5% NaCl solution under hydrostatic pressure using electrochemical impedance spectroscopy.....	25

9. The Effect of Rich Silicon particles on the Corrosion Behavior of Multilayer Aluminum Alloy Composite Plates in NaCl solution	26
10. Study on the rapid detection method for coating performance based on phase angles with three methods of correlation analysis	27
11. In-situ preparation of triazole polymerization films on copper surface via SI-ATRP method and their performance against copper corrosion.....	28
12. The physical significance and universality of electrochemical active energy in metal electrodeposition.....	29
Wear & Corrosion	30
1. Tribocorrosion behaviors of three nickel-based superalloys in sodium chloride solution	31
2. Alkene Catalyzed wear and corrosion on black phosphorus for nanopatterning	32
3. Hydro-abrasive erosion behaviors of HVOF sprayed carbide-based cermet coatings in simulated seawater slurries.....	33
4. Electrochemical characterization of copper corrosive wear mechanism in chemical mechanical polishing	34
5. Role of protein in fretting-crevice corrosion of CoCrMo alloy used for artificial implants	35
6. Tribo-corrosion investigation during the chemical mechanical polishing (CMP) process of integrated circuit.....	36
7. Significant role of repassivation in the critical flow velocity phenomenon of erosion-corrosion of passive materials	37
8. Localized corrosion of AA5083 in a simulated dynamic seawater/air interface studied by EIS and advanced characterization.....	38
9. The research progress on adsorption-desorption of corrosion inhibitor under the pipe flow condition.....	39
10. Study on wear and corrosion resistance of Ti3Alc2/resin-based composite coating by high-energy ball milling process	40
Measurements & Analysis and Sensors.....	41
1. Determination of Corrosion Rate with Electrochemical Harmonic Measurement and Analysis	42
2. Impedance Spectroscopy: Quo Vadis?	43
3. Significance of impedance measurements in skin phantom with 2, 3 and 4 electrodes configuration. Measurements and simulations	44
4. Investigating the diffusion of water and ions in organic coatings using coupled ORP-EIS and in situ ATR-FTIR in Kretschmann geometry	45
5. Machine learning to predict electrochemical impedance spectra (EIS): Can EIS be replaced by constant current techniques?	46
6. Investigation of the Unstable Phenomenon of Electrochemical Impedance Spectroscopy Measurements for Pt Electrode in a Rotating Disk Electrode	47
7. Nanoplasmonic Material Based Photoelectronic Biosensing for Personalized Immune Monitoring.....	48
8. Proton conductivity measurement of electrospun nanofiber with self-bonding and pre-conditioning	49
9. Data-driven optimization model customization for atmospheric corrosion on low-alloy steel.....	50

10. Mahalanobis-Taguchi Method Based Anomaly Detection for Lithium-Ion Battery Module.....	51
11. A Comparative Study of Frequency Response Analysis Methods for PEM Fuel Cell Diagnostics	52
12. The Relationship between Microstructure and Electrochemical Impedance of Ag/AgCl Electrode for Chloride Detection	53
13. Impact of cavitation erosion intensity on the electrochemical impedance spectroscopy of 7050AA aluminium alloy in NaCl solution	54
14. Electrochemical measurements in small droplet of electrolyte: example of the use of ionic liquids	55
15. Operando EIS and its application to Li-ion batteries	56
16. The Measurement Model Regression Program	57
17. Determination of dielectric properties of mimicking biological tissues by electrochemical impedance spectroscopy.....	58
18. Frequency response of Gibbs free energy and enthalpy changes of electrochemical systems analyzed as thermometric transfer functions.	59
19. Uncertainty estimation on bioimpedance measurements	60
20. Classification of the Galvanic Corrosion States for Multi-Metals Jointed Pipelines Based on Adaboost Algorithm	61
21. An electrochemical sensor based on Au@Ag NPs/MnO ₂ NFs for H ₂ O ₂ detection .	62
22. Analysis of electrochemical impedance spectrum response characteristics of SOFC at low current density	63
23. An electrochemical sensor for trypsinogen 2 detection.....	64
Metallic Corrosion	65
1. The effect of Cl ⁻ for corrosion resistance on CrMnFeCoNi high entropy alloys by EIS and Polarization curve in sulfuric acid solutions.....	66
2. Study on the metal/salt hydrate interfaces under solid-liquid transitions of phase change material based on EIS and EN methods.....	67
3. Effect of barnacle adhesion on the corrosion and hydrogen permeation behavior of high-strength steel in marine environment.....	68
4. Effects of dissolved oxygen and hydrostatic pressure on the corrosion behavior of mooring chain steel in simulated deep-sea environments	69
5. A brief summary of the operando ORP-EIS study regarding the consumption of copper electroplating additives.....	70
6. Insight into physical interpretation of electrochemical impedance spectra of Mg.....	71
7. Electrochemical Impedance Spectroscopy Evaluation on the Corrosion of GCr15 Bearing Steel Coated with Rust Preventive Oil Film.....	72
8. EIS comparative study and critical EEC analysis of the native oxide layer of additively manufactured and wrought 316L stainless steel.....	73
9. A planar and cross-sectional study of the electrochemical and localized corrosion behavior of a quad-layer Al alloy composite in chloride-containing environment	74
10. Co-based metal organic framework sensitized TiO ₂ nanorods arrays for enhanced photocathodic protection of 316L stainless steel.....	75
11. Study on corrosion mechanism and low cycle fatigue behaviour of Q345R steel influenced by Thiobacillus ferrooxidans	76
12. Atomic understanding microstructure of copper-aluminum alloys with improved	

chemical stability	77
13. Microstructure construction and insight into chemical stability for Cu-Ni alloys with controllable composition at atomic level.....	78
14. Failure analysis of a heat exchanger tube of 70/30 cupronickel.....	79
15. Study on the Mechanism of 7075 Aluminum Alloy Corrosion by Penicillium funiculosum	80
16. Effect of electron shuttle riboflavin on Escherichia coli corrosion of X80 pipeline steel.....	81
17. Effect of Thiobacillus ferrooxidans on the corrosion behavior and low cycle fatigue performance of Q345R steel.....	82
18. Investigation of Local Corrosion Behavior and Mechanism for TA2/HA177-2/316L SS Coupling System under Seawater Liquid Film	83
19. Microstructure construction and insight into chemical stability for Cu-Ni alloys with controllable composition at atomic level.....	84
20. NIR-induced corrosion regulation strategy for biodegradable Mg alloy	85
21. Local corrosion behavior of X80 steel welded joints under micro-turbulence induced by welding reinforcement height.....	86
22. Effect of Cu ²⁺ and Hg ²⁺ on the corrosion behavior and mechanism of Al-2 %Zn coatings in 3.5 % NaCl solution	87
23. Application of electrical impedance spectroscopy in cathodic protection studies ...	88
24. Research on the Correlation between ICG and Tensile Properties of Alloy 625	89
25. Electrochemical characteristics of the additive manufacturing AlSi10Mg alloy in a 3.5 wt.% NaCl solution	90
26. Study on Cathodic Polarization Behaviors of High Strength Stainless Steel.....	91
27. Study on the electrochemical corrosion process of as-cast nickel-aluminum bronze under cavitation	92
Inhibitors	93
1. The Electrochemical behavior of Amorphous Alloy - From Corrosion to Electrocatalysis.....	94
2. Self-healing performance of ethyl-cellulose based supramolecular gel coating highly loaded with different carbon chain length imidazoline inhibitors in NaCl corrosion medium	95
3. Effect of Tween 85 and calcium malate as hybrid additives on the performance of alkaline aluminum-air batteries	96
4. Corrosion Inhibition of [EMIM]SCN for Copper in 3.5% NaCl Solution.....	97
5. Benzothiazole derivatives-based supramolecular assemblies as efficient corrosion inhibitors for copper in artificial seawater: Formation, interfacial release and protective mechanisms	98
6. Ce post-treatment on the corrosion resistance of aa2024-t3 anodized in TSA and sealed with hybrid coatings	99
7. Tailoring corrosion and discharge performance of Mg anode by corrosion inhibitor	100
8. Water-Soluble AIE Molecule As a Fluorescence Indicator And Novel Corrosion Inhibitor For N80 Steel.....	101
9. Exploration of Imidazol-4-Methylimine Thiourea as Effective Corrosion Inhibitor for Mild Steel in Hydrochloric Medium: Experimental and Theoretical Studies.....	102

Coatings & films	103
1. Self-lubricating polymeric materials with self-healing functions	104
2. Investigation of self-healing coatings via macro/microscale electrochemistry.....	105
3. Damaged mechanism of organic coating caused by the synergistic effect between alternating load and corrosion	106
4. Acrylate-based self-healing elastomer coating enhanced by photothermal MXene composites with anti-corrosion property	107
5. Application of ORP-EIS coupled with ATR-FTIR in Kretschmann geometry as an integrated spectro-electrochemical technique to investigate the separate transport of water and ions in organic coated metals.....	108
6. The relationship between growth mechanism of product film and in situ electrochemical behavior of N80 steel in CO ₂ corrosion at different conditions.	109
7. Electrochemical investigation of titanium alloy corrosion triggered by electroactive Desulfovibrio ferrophilus biofilm in simulated seawater containing exogenous electronic shuttle.....	110
8. Degradation of a solvent-free general epoxy coating in three simulated environments and its lifetime prediction	111
9. Operando ORP-EIS for in situ monitoring of metal surface treatment processes....	112
10. A bifunctional epoxy coating doped by cerium (III)-8-hydroxyquinoline: early self- reporting and stimuli-responsive inhibition on corrosion of Al substrate.....	113
11. An EIS study of corrosion resistance and antibacterial activities of a new composite coating on AZ91 magnesium alloy surface	114
12. Preparation of Cr _x Zn _{1-x} O resistive switching films and research of its corrosion behavior in 3.5wt% NaCl solution	115
13. The surface chemical reconstruction of Cu-Al alloys: Improving their service performance in harsh environment.....	116
14. Formation of self-healing PEO coatings on AM50 Mg by in-situ incorporation of zeolite micro-container	117
15. Design and realization of versatile durable fluorine-free anti-corrosive coating with robust superhydrophobicity	118
16. Features of electrochemical impedance spectroscopy during the failure of conductive coatings	119
17. Global and local electrochemical behaviors of the in-situ conversion coating of Mg alloy based on EIS and SVET	120
18. Preparation and Electrochemical Corrosion Behavior of Graphene-Al ₂ O ₃ Mixed Coating on Carbon Steel Substrate.....	121
19. Study on the corrosion resistance of highly conductive composite coatings	122
20. Effects of Tensile Stress on the Corrosion Electrochemical Behaviors of Coated 2024-T3 Al-Alloys	123
Battery	124
1. Scientific basis of energy storage technology for iron-chromium redox flow batteries	125
2. In-situ measurement of multi-physics field and voltage loss distribution in proton exchange membrane fuel cells.....	126
3. A Theoretical Study on the Mechanical Effect on Impedance Response of Lithium Ion Batteries: from Single Particle to Porous Electrode.....	127

4. A systematic Study on the impedance response of All-solid-state Thin-film Lithium Battery	128
5. Determining the fast-charging boundary and achieving lithium plating early warning with EIS for safe lithium-ion batteries	129
6. Study on Discharge Reaction of Polysulfide-Insoluble Lithium-Sulfur Battery with Faradic Impedance Measurement.....	130
7. Operando Electrochemical Impedance Spectroscopy for Monitoring Lithium-ion Batteries during Fast Charging.....	131
8. Study on Low-Temperature Electrochemical Impedance Spectroscopy of LiFePO ₄ Batteries Based on Reference Electrode.....	132
9. Superlattice-Stabilized WSe ₂ Cathode for Rechargeable Aluminum Batteries	133
10. Research on Carbonation Behavior of Bipolar Membrane Fuel Cell.....	134
11. Research progress of CuS as cathode materials for rechargeable magnesium batteries.....	135
12. Unexpected Effects in Galvanostatic EIS of Randles' Cells: Initial Transients and Harmonics Generated	136
13. Development of an Odd Random Phase Electrochemical Impedance Spectroscopy Sensor for Battery Management Systems.....	137
14. Electroactive Sites for Oxygen Electroreduction Over Heteroatom Doped Carbon Interpenetrating Networks in Acid Electrolyte.....	138
15. Jagged carbon nanotubes from polyaniline: Strain-driven high-performance for Zn-air battery.....	139
16. Nanofiber structure IrO ₂ -TiN as an anode catalyst layer for water electrolysis.....	140
17. In-situ investigation of the dynamic loadings for proton exchange membrane fuel cell with a large active area: considering the in-plane heterogeneity.....	141
18. Electrochemical Impedance spectroscopy for accessible carbon	142
19. Analysis of degradation mechanism in unitized regenerative fuel cell based on the EIS method	143
20. An investigation of surface prelithiated SiO _x anode materials and its interfacial properties to electrochemical performance.....	144
21. Electrochemical performance of an internal methanol reformer with a CsH ₅ (PO ₄) ₂ -Doped Polybenzimidazole Membrane	145
22. Catalyst coated membrane method to fabrication membrane electrode assembly for high temperature proton exchange membrane.....	146
23. Preparation of Membrane Electrode Assemblies by Directly Coating Electrolyte Dispersion onto Catalytic Layer	147
24. Comparison of different methods for cross section preparation of ePTFE reinforced perfluorosulfonic acid membranes	148
25. EIS Investigation of Vitrocell C and D Size Li/SOCl ₂ and Li/SOCl ₂ /SO ₂ Cl ₂ Mixture Batteries	149
26. Degradation Detection of Li-ion Batteries by Impedance Parameters Determined from Charge Curve	150
27. Effect of Water on Local Transport Resistance in Catalyst Layer of PEMFC.....	151
Electro-catalysis	152
1. Effects and EIS Analysis of Pure Water Electrolysis with Overlapping Cathode/Anode EDLs.....	153

2. Pioneering Performances of RuIr Nanoalloys towards Efficient Acidic Water Splitting	154
3. Towards Ultra-high Resolution and Localized EIS for Advanced Energy Research	155
4. Platinum composite titanium-based substrate for electrocatalysis	156
5. Analysis of Proton Transport in Electrospun Catalyst Layer	157
6. Insight into the Origin of Pseudo Peaks Decoded by DRT/ DDC for EIS	158
7. Pyrolysis-free COP-based Electrocatalysts Applied in Energy Devices	159
8. Solid-phase Thermal Migration Synthesis of Fe-N-C Catalyst Toward High Efficiency Oxygen Reduction in both Alkaline and Acidic Media	160
9. A method for structure design and performance prediction of W/Sn-doped PtCu-based ternary alloy catalysts for oxygen reduction	161
10. The plasmon-mediated photoelectrochemical water-oxidation studied by a combination of electrochemical impedancespectroscopy and surface-enhanced Raman spectroscopy on an ultramicroelectrode	162
11. One-step synthesis of PtM anchored on TiO ₂ nanotube arrays for methanol oxidation	163
12. Ultrathin Ti ₃ C ₂ T _x MXene sheets with high electrochemically active area anchored Pt boosting hydrogen evolution	164
13. Electrochemical Impedance Diagnosis of the Hydrogen Electrode Reactions in Alkaline	165
14. Evolution of components and electrochemical response characteristics of hydrogen-charged copper surface	166