Electrochem 2023

University of Bristol, 10th – 12th September

Programme

Sunday 10th September

Time	Event
From 17:30	**Registration and Museum Access** The SS Great Britain
18:00 – 20:00	**Welcome Reception** The SS Great Britain

Monday 11th September

Time	Symposium A Advances in Electrochemical Energy Conversion and Storage	Symposium B Photoelectrochemistry and Sustainable Electrochemical Transformation	Symposium C Electrochemical Sensors and Electroactive Porous Materials	Symposium D In-Situ Spectroelectrochemistry and Interfacial Electrochemistry	Symposium E Corrosion Science and Technology
	Reception Room	Old Council Chamber	Room 3.30	Room 3.31	Room 3.32
08:00 – 08:45	**Registration** Entrance Hall				
08:45 – 09:00	**Opening Remarks** Reception Room				
09:00 – 09:50	*RSC Faraday Medal Award* **Unravelling the Nanopore Electrochemistry Landscape: My Academic Journey** **Yitao Long** Reception Room *Chairs: Sarah Horswell and David Fermin*				

09:50 – 10:10	*Presentations by Exhibitors* **Metrohm, Biologic, Equilabrium, Alvatek** Reception Room				
10:10 – 10:40	**Refreshments, Poster Session, and Exhibitors** The Great Hall				
	Electrolysers and Fuel Cells *Chair: Mark Symes*	**Photoelectrodes and Photoelectrochemical Reactors** *Chair: Anna Hankin*	**Electrochemical Sensing I** *Chair: Sudipta Roy*	**Operando Spectroelectrochemistry I** *Chair: Andrea Russell*	**Corrosion Science I** *Chair: Thomas Martin*
10:40 – 11:10	**A1 – K. Brinkert**	**B1 – L. Peter**	**C1 – A. Colina**	**D1 – V. Celorrio**	**E1 – D. Kumar**
	Energy-Efficient Oxygen and Fuel Production in (Photo-)Electrochemical Devices in Microgravity Environment	Photoelectrode Kinetics	On the Capabilities of Electrochemical Surface Oxidation Enhanced Raman Scattering for Analysis	Relationship Between Mn Oxidation State Changes and Oxygen Reduction Activity in (La,Ca)MnO_3 Probed by In-Situ XAS and XES	On the High Temperature Water Oxidation and Stress Corrosion Cracking of Reduced Activation Ferritic Martensitic Eurofer-97 Steel
11:10 – 11:30	**A2 – S. Ünsal Dayanik**	**B2 – G. Creasey**	**C2 – F. Rawson**	**D2 – T. McIntyre**	**E2 – V. Bongiorno**
	Enhanced Proton Exchange Membrane Fuel Cell Performance via Graduated Catalyst Layer Ionomer Content	Materials and Reactor Development for Photoelectrochemical Hydrogen Production	Quantum Electrochemical Sensors and Actuators: Pioneering a Novel Frontier in Cancer Therapy	Probing the Structure of the Electrochemical Interface Using In-Situ Surface X-Ray Diffraction Techniques	Automating Corrosion Testing for Organic Coatings: A Machine Learning Based Approach
11:30 – 11:50	**A3 – M. Shnaiter**	**B3 – A. Karunakaran**	**C3 – E. Dixon**	**D3 – S. Kumar**	**E3 – Y. Liu**
	The Preparation and Characterisation of Inkjet Printed Low Iridium Loaded Anodes for PEM Water Electrolysis	Nanophase-Photoelectrocatalysis: Loading, Storing, and Release of H_2O_2 Using a Photochemical Reaction Within Graphitic Carbon Nitride	Electrochemical Processing of Nanoporous Copper as a High Surface Area Enhanced Catalyst for Sensing Applications	Development of Spectro-Electrochemical Cell for Operando NAP-XPS/NEXAFS Investigations	Degradation of Marine Coatings During Hygrothermal Cyclic Corrosion Tests

11:50 – 12:10	**A4 – D. Shinde** In-situ reference electrodes for characterization of alkaline water electrolysers	**B4 – M. Colet-Lagrille** Ultra-Thin Alumina Overlayer as a Protective Coating on $CuWO_4$ Photoanodes	**C4 – A. Etchegaray Jr** A biosensor for methotrexate can be designed using dihydrofolate immobilized onto iron magnetic nanoparticles	**D4 – J. J. Tully** EPR Spectro-Electrochemistry as a Tool for Studying Radical Generation on Boron Doped Diamond Electrodes	**E4 – L. Coghlan** The Degradation Mechanism of Polyester Powder Coatings Exposed to Cyclic Corrosion Testing (CCT)
12:10 – 13:40	**Lunch Refreshments, Poster Session, and Exhibitors** The Great Hall **SCI ECTG Committee meeting**: 12.30 – 13.00 Old Council Chamber **Joint RSC Electrochemistry Interest Group and SCI ECTG Committee Meeting**: 13.00 - 13.30 Old Council Chamber				
13:40 – 14:30	*ICORR UE Evans Award* **Towards sustainable corrosion resistant alloys** **Nick Birbilis** Reception Room *Chair: Julian Wharton*				
14:30 – 14:50	*Presentations by Exhibitors* **Scimed, Nikalyte, Hiden Analytical** The Great Hall				
	Electrocatalysts for Hydrogen Generation *Chairs: Laurie King and Katharina Brinkert*	**Sustainable Electrochemical Transformations I** *Chairs: Alastair Lennox and Melanie Colet-Lagrille*	**Electrochemical Sensing II** *Chairs: Yitao Long and Alvaro Colina*	**Operando Spectroelectrochemistry II** *Chairs: Robert Weatherup and Veronica Celorrio*	**Corrosion Science II** *Chairs: Nick Birbilis and Amber Sikes*
15:10 – 15:30	**A5 - M. A. Buckingham** Advanced Electrocatalysis from High Entropy Metal Sulphides	**B5 – T. Liu** Redox Neutral Electrosynthesis without Added Electrolyte at Interdigitated Electrodes	**C5 – R. Shergill** Pre-printing saponification of carbon thermoplastic filaments provide ready-to-use electrochemical sensors	**D5 – S. Redor** Using Operando Reflection Optical Microscopy to Explore the Electrochemical and Electrochromic Properties of $Li_2Ni_2W_2O_9$	**E5 – R. Abou-Shakra** Surfactant Corrosion Inhibitor Adsorption and Desorption Kinetics in Aqueous CO_2-Containing Environments

15:30 – 15:50	**A6 - T. Manyepedza** Transition Metal Dichalcogenide Heterostructures as Electrocatalysts for the Hydrogen Evolution Reaction	**B6 – D. H. Broadhurst** High Yield and Selective Electrocatalytic Reduction of Nitroarenes via Polyoxometalate Redox-Mediated Chronoamperometry	**C6 – C. H. Liu** Electrochemical Aptasensor for SARS-CoV-2 Detection Based on Magnetic MOF and Screen-Printed Electrode	**D6 – L. Wichmann** Correlation of Excess Lithium, 'Dead Lithium' and Functional Layers in 'Anode-Free' Lithium Metal Batteries	**E6 – H. Hilton-Tapp** Production of Copper Nanocomposite Coatings Using Pulse Reverse Plating and Anionic Surfactant
15:50 – 16:20	**Refreshments, Poster Session, and Exhibitors** The Great Hall				
16:20 – 16:40	**A7 - A. K. Samuel** Are 2D Chalcogenides Suitable for PEM Water Electrolysis: The Case Study of the Application of $MoTe_2$ in a Single Stack Electrolyser	**B7 – N. Alhathlaul** Room Temperature Electro-Carboxylation of Styrene and Stilbene Derivatives: A Comparative Study	**C7 – G. Smith** Error, Reproducibility and Uncertainty in Electrochemical Measurements	**D7 – S. L. Horswell** Why Do Similar Molecules Respond Differently to Electric Fields? Hydrogen Bonding Effects in Biomimetic Membranes	**E7 – T. H. E. Dobson** Effect of Biofouling on the Corrosion of Nickel Aluminium Bronze Immersed in Natural Sea Water
16:40 – 17:00	**A8 - D. Belami** Catalyst-Support Design for Proton Exchange Membrane Electrolysers	**B8 – A. Choi** 3D-Printing for Electrochemical Reactors and a Tool Kit for the Expansion of the ElectraSyn	**C8 – J. Lehr** Selective Detection of Protein Biomarkers via Multifunctional Molecular Layers from Electrografting Methods	**D8 – F. Carla** In-situ and Operando Characterization of Electrochemical Interfaces by Surface X-ray Diffraction and Scattering	**E8 – M. Makuch** Phase Field Model of Accelerated Corrosion Tests and Single Crystal Polarisation Anisotropy
17:00 – 17:20	**A9 – S. Yadav** Investigating the Electrocatalytic Water Splitting Efficacy During the Dimensional Transition from Single-Atom to Nanoparticles with Porous Hard-Carbon as Supports	**B9 – F. Todman** Decoupled biomass oxidation and hydrogen production mediated by phosphomolybdic acid	**C9 – A. M. López-Marzo** Toward Completely label-Free Point-of-Care Devices Using Bioreceptor Immobilisation by Hydrogen Bonding and Differential Pulse Voltammetry as Measurement Tool	**D9 – Andrew J. Wain** New Cell Designs and Sample Configurations for Operando Raman Spectroscopy of Battery Electrodes	**E9 – J. Thevakumar** Casing Corrosion of Steels in Geothermal Environments Containing Sulphuric Acid

17:20 – 18:00	**RSC Electrochemistry Interest Group AGM:** Reception Room **SCI Electrochemical Technology Group AGM:** Old Council Chamber
19:00	**Banquet** Bristol Museum and Art Gallery

Tuesday 12th September

Time	Symposium A Advances in Electrochemical Energy Conversion and Storage	Symposium B Photoelectrochemistry and Sustainable Electrochemical Transformation	Symposium C Electrochemical Sensors and Electroactive Porous Materials	Symposium D In-Situ Spectroelectrochemistry and Interfacial Electrochemistry	Symposium E Corrosion Science and Technology
	Reception Room	Old Council Chamber	Room 3.30	Room 3.31	Room 3.32
08:30 – 09:00	**Arrival**				
09:00 – 09:50	*RSC Parsons Medal Award* **Revealing Reactions at Buried Electrochemical Interfaces with X-ray Spectroscopies** **Robert S. Weatherup** Reception Room *Chairs: Sarah Horswell and Alastair Lennox*				
09:50 – 10:10					
	Batteries and Supercapacitors I *Chairs: Xiaohong Li and Mark Buckingham*	**Sustainable Electrochemical Transformations II** *Chairs: Frank Marken and Charl Faul*	**Electrochemical Sensing II** *Chairs: Augusto Etchegaray and Elena Bernalte*	**Interfacial Electrochemistry I** *Chairs: Petra Cameron and Henry Lloyd-Laney*	**Corrosion Science III** *Chairs: Lawrence Coghlan and Hannah Hilton-Tapp*
10:10 – 10:30	**A10 – R. Gray** *RSC Regional Award* Alternative Architectures for Structural Batteries	**B10 – C. Sharma** Polyaniline/Polypyrrole Composites Electrodeposited from Ionic Liquids for Hydrogen Evolution Reaction	**C10 – S. Zhang** *S. Campbell Award* Biosensor for Rapid Measurement of Lactate in Exhaled Breath Condensate	**D10 – I. Terrero Rodríguez** The Importance of sp^2 Bonded Carbon in Electrochemical Ozone Production Using Freestanding Boron-Doped Diamond Anodes	**E10 – P. Thomas** Microstructural Evolution Due to CO_2 Oxidation and Carburisation in 9Cr-1Mo Steel
10:30 – 10:50	**A11 – I. J. McPherson** Interpreting Single Particle Voltammetry of Battery Materials	**B11 – S. Rodriguez** Valorisation of CO2 and other abundant waste streams	**C11 – T. Narayan** Real-Time Electrochemical Sensor for the Detection of Endocrine Disruptors in Water Samples	**D11 – A. W. Black** Exploring Boron Doped Diamond as an Electrocatalyst Support for Alkaline Water Electrolysis	**E11 – C. Ozturk** Atmospheric Corrosion of 316L Stainless Steel: The Effect of Stress and Strain

10:50 – 11:20	**Refreshments, Poster Session, and Exhibitors** The Great Hall				
11:20 – 11:40	**A12 – G. Bree**	**B12 – H. Sale**	**C12 – C. N. Yang**	**D12 – H. A. Al Nasser**	**E12 – A. Sykes**
	Calendar Aging of Commercial Cylindrical Li-Ion Batteries – Mechanisms and Mitigation Strategies	Optimising the Electrochemical Reduction of CO_2 to Oxalic Acid in Propylene Carbonate	Observing Confined Local Oxygen-Induced Reversible Thiol/Disulfide Cycle with a Protein Nanopore	Electrochemical Assessment of a Tripodal Thiourea-Based Anion Receptor at the Liquid|Liquid Interface	The Effect of CO_2 Partial Pressure on the Formation and Protective Characteristics of Iron Carbonate Corrosion Products
11:40 – 12:00	**A13 – Z. Zhu**	**B13 – L. Yusuf**	**C13 – S. O'Sullivan**	**D13 – J. V. Díaz-Reyes**	**E13 – A. Hanson**
	High Sodium-Ion Battery Capacity in Sulfur-Deficient Tin(II) Sulfide Thin Films with a Microrod Morphology	Optimising Ultrasound Parameters for Efficient Sonoelectrochemical CO_2 Reduction at Copper Electrodes	3D-Printed Microfluidics System Coupled with Electrochemical pH Control for Enhanced Chlorine Detection	Theoretic Approach to the Capacitance of Aqueous|α,α,α-Trifluorotoluene Interfaces	Understanding the Effect of Strain on Corrosion of Advanced Gas-Cooled Reactor Fuel Cladding
12:00 – 12:20	**A14 – J. Searle**	**B14 – M. S. Tovar-Oliva**	**C14 – F. Perez**	**D14 – J. W. Jordan**	**E14 – X. Wen**
	Diketopyrrolopyrroles as Performance Enhancing Additives for Lithium-Sulfur Batteries	Optimised Electrodeposition Technique for In-Situ Fabrication of Cu-Based Catalysts on Gas Diffusion Layers for Electrochemical CO_2 Reduction	Development of an Electrochemical Biosensing Array for Simultaneous Detection of Urinary Metabolites for Disease Profiling	Voltammetric Evidence of Proton Transport Through the Sidewalls of Single-Walled Carbon Nanotubes	Study of Carbon Steel Corrosion in Live Anaerobic Digestion Reactors
12:20 – 12:40	**A15 – W. Townsend**	**B15 – Z. Zhu**	**C15 – C. Miller**	**D15 – S. M. Lu**	**E15 – J. Srivastava**
	Exploring the role of redox-shuttle mediators in lithium-sulfur batteries	Carbon Nanotube Production from CO_2 Via High Temperature Electrolysis	Evaluating the Impact of Different Electrode Surface Patterns of 3D Printed Carbon Thermoplastic	Confinement-Controlled Nanoelectrochemistry: Study One Entity at a Time	The Influence of Grain Structure on Hydrogen-Environmentally Induced Cracking (H-

			Electrochemical Sensors		EIC) Behaviour of AA7085 Alloy in Humid Air
12:40 – 14:00	**Lunch, Poster Session, and Exhibitors** The Great Hall				
	Batteries and Supercapacitors II *Chairs: Ian McPherson and Andy Wain*	**Sustainable Electrochemical Transformations III** *Chairs: Zeliha Ertekin and Laurie Peter*	**Electroactive Porous Polymers** *Chairs: Santiago Rodriguez and Loredana Vacareanu*	**Interfacial Electrochemistry II** *Chairs: Alison Parkin and Sara Dale*	**Corrosion Science IV** *Chairs: David Kumar and Tamsin Dobson*
14:00 – 14:20	**A16 - M. Smith**	**B16 – H. L. A. Dickinson**	**C16 – F. Marken**	**D16 – Z. Li**	**E16 – C. E. Elgar**
	Investigating Degradation of 1,3-Dimethyl-2-Imidazolidinone Electrolyte in Li-S Batteries	NiCuAg: An Electrochemically Synthesised Trimetallic Stack for CO_2 Reduction	Triphasic Electrochemical Processes Enhanced by Polymers of Intrinsic Microporosity	Driving Electrochemical Membrane Processes with Coupled Ionic Diode	Using Ultrasound to Increase Metal Anodic Dissolution and Prevent Passivation Using Concentrated Ionic Fluids
14:20 – 14:40	**A17 – M. Binari**	**B17 – P. K. Sharma**	**C17 – C. F. J. Faul**	**D17 – K. J. Levey**	**E17 – A. Keogh**
	MnO_2 Nanotube/GO Composite Anode for High Performance Lithium-Ion Capacitor	Earth Abundant CuSn Electrocatalysts for Selective Conversion of CO_2 to CO	Porous Organic Materials for Metal-Free CO_2 Capture and Electrocatalytic Conversion	The Importance of Considering Electrostatics When Numerically Modelling the Cyclic Voltammetric Response of an Outer-Sphere Redox Couple	Effect of Microstructure on Localised Corrosion and Atmospheric Stress Corrosion Cracking of 15-5 PH Stainless Steels
14:40 – 15:00	**A18 – M. Hunt**	**B18 – L. Navarro-Tovar**	**C18 – K. DeMonte**	**D18 – H. Lloyd-Laney**	**E18 – J. Rafferty**
	Few-layer Graphene as a Conductive Additive for Flexible Aqueous Supercapacitor Electrodes	Electrodeposition of Cu-Based Bimetallic Catalyst Over Gas Diffusion Layer (GDL) for the Electrochemical Conversion of CO_2	Porphyrin-Like Designer Catalysts for Electrocatalytic H_2 Evolution and Selective CO_2 Reduction	Recovering Biological Electron-Transfer Parameters: The Perspective of Multiple Techniques	Environmental Effects of a Simulated AGR Coolant on Oxidation and Carburization Behaviour of Type 316H Stainless Steel

15:00 – 15:20	**A19 – Z. Zhang**	**B19 – A. Randi**	**C19 – L. Vacareanu**	**D19 – I. Scivetti**	**E19 – W. Intaphan**
	Electrochemical Atomic Force Microscopy in Battery Study	Atmospheric-Pressure Plasma Device for CO_2 Conversion and Utilisation	Electrogenerated Microporous Conjugated Polymers Based on Starshaped Oligomer Derived from Triphenylamine: Exploring Structure-Properties Relationships	Stoichiometric Resolution in the Electrochemistry of Oxide Materials: Driving Computational Research with Electrochemical Quartz Crystal Microbalance	Elucidation of Charge-Transfer Mechanisms Under Paint Films by Conventional and Localised Electrochemical Impedance Spectroscopy
15:20 – 15:40	**A20 – S.R. Ottakath**	**B20 – E. Latvyte**	**C20 – D. Duleba**	**D20 – M. E. Keal**	**E20 – C. Bevas**
	Understanding battery health and identification of ageing history of commercial lithium-ion batteries using nonlinear frequency response analysis (NFRA)	A Low-Temperature Ammonia Electrolyser for Wastewater Treatment and Hydrogen Production	Proton Enrichment and Surface Charge Dynamics in Nanopores	Electrochemical Recycling of Ruthenium Via Nano-Impacts	The Influence of Radiation on the Corrosion of Carbon Steel for Nuclear Waste Geological Disposal
15:40 – 16:00	**Refreshments, Poster Session, and Exhibitors** The Great Hall				
16:00 – 16:50	*Fleischmann Lecture* ***In situ* to *Operando*: an XAS journey to understand electrocatalysts** **Andrea E. Russell** Reception Room *Chairs: Sarah Horswell and David Fermin*				
16:50 – 17:00	**Closing Remarks** Reception Room				