No. 1 October 2024

NEWSLETTER

Serving Electrochemical Science, Technology and Engineering within the catchment of

The Royal Society of Chemistry
and
The Society of Chemical Industry

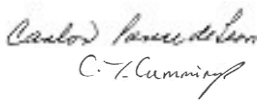
Contents

Editorial

Welcome to the 2024 issue of the Electrochemistry Newsletter. This year has continued to be a busy year with in-person events and meetings, reestablishing old collaborations and connections. In this issue we include: industry insight interview, regional conference reports, Electrochem23/24 report and product information.

A number of reports from both national and international conferences are documented in this edition. If you are interested in contacting the Electrochemistry Group of the RSC please use the RSC online webpage (link).

We welcome any feedback and suggestions or contributions from readers for future issues.



If you wish to notify the editors with your view on the material or the content of any item in this issue, or if you wish to contribute to the newsletter, please write to either Editors (Carlos Ponce-de-León, Faculty of Engineering and the Environment University of Southampton or Charles Cummings, Chemistry (Atmospheres) & Power Sources, QinetiQ) at:

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Missed a copy? You can catch up on all the news *via* our web-space hosted by the Royal Society of Chemistry at the following URL.

http://www.rsc.org/Membership/Networking/InterestGroups/Electrochemistry/news.asp

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Industry Insight

Leading the Development of Battery Safety, an Interview with Dr Brian Morin CEO of Soteria

Charles Cummings[a]

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(email: cycummings@qinetiq.com**)**

Introduction

As part of this year's RSC Electrochemistry Newsletter, an interview was conducted with Dr Brian Morin founder and CEO of Soteria [1]. Brian received his Ph.D. and M.S. degrees from the Ohio State University and began his career at DuPont and Milliken. Brian founded Soteria in 2017 which is headquartered in Greenville, SC, USA and serves the consortium by leading the commercialization of innovative technology. Soteria's patented technology addresses the root cause of thermal runaway, while the consortium enables broad access to innovative technologies.

Interview transcript with Brian Morin from Soteria [1]

RSC: Hi Brian, thank you again for making time for the interview. I was wondering if you could give a brief overview of your professional experience?

Brian: Sure, I have a background in physics having attained a Bachelors from University of North Carolina and then Masters and PhD from Ohio State University. My PhD itself was in materials physics and the title was "disorder in molecular magnetics". I joke that at one point I was a world expert in disorder! Following my education I spent the next 10 years working at big companies including DuPont

and Milliken. In 2004 I became an entrepreneur developing and exploiting ballistic fibre for defence applications. At the time there was a strong market demand for new materials, however, as the technology was developed and scaled conflicts were resolved and the global financial crises hit. Although the technology pivoted into composites the demand didn't match what we had envisaged. As a result new management took over and I moved out into the battery industry. In 2011 I started a company called Dreamweaver. Dreamweaver makes a high temperature thermal resistance separator for lithium-ion batteries. We contract manufacture the technology and market it. The challenge was that the battery industry would not accept sole source production for wide adoption of new technologies. In 2017 we started Soteria which is based on a consortium and licensing model where we promote, develop and market battery safety technologies.

RSC: That's interesting you transitioned from fibres to batteries, can you give some insights into that transition?

Brian: So it wasn't planned! I was working on high strength fibre and one of the properties is that it can fibrillate. At the time working with a consultant, Jim Schaeffer for non-woven applications of the technology. Jim had been CEO of a billion dollar company with a lot of experience. When I moved on from the fibre industry he called me up and asked "*have you thought about making nanofibers for battery applications?*" From my previous role, I knew there are a number of technologies that can achieve this. I took some time to undertake research and I came up with the concept of Dreamweaver. We started the company after a dinner where I proposed "*I'll work 6 months for free, if you pay the expenses*" and we started Dreamweaver. That was the transition! The Dreamweaver separator is made from nanofibers, I am a nanofibers guy, but I knew nothing about batteries or the battery market! Jim took the lead on that and he was a great mentor and I learned alot.

RSC: Sounds like a great and fruitful partnership. Following on from Dreamweaver technology can you introduce Soteria?

Brian: Soteria's vision is to introduce new battery safety technologies with a broad supply chain into industry. Our technologies are compatible with every battery, form factor and chemistry so there is significant potential to increase safety and we have a business model to facilitate this. This is through a broad-based technology license model and support through the consortium. There are similarities with the business models used by Qualcomm and ARM for technology development and integration. Soteria's customer promise is to allow access to the safety technology with a low royalty rate, which is FRAND—fair, reasonable and non-discriminatory. The partnership is loosely defined and similar to the partnership between Microsoft and software companies in the early days of the PC. I view Soteria as a team of teams, which includes the core-Soteria team that develops some of the technology and leads the consortium and the consortium partner teams which increases technical scope, integration, supply and marketing. Our goal is to get everyone moving in the same direction of safer batteries. To facilitate this we are very open with information, Soteria does not keep secrets from the consortium and we have trusting and long term relationships.

RSC: Can you speak about products or technologies that Soteria is developing and marketing?

Brian: Sure I can speak about three. The first one is the Dreamweaver separator in commercial 18650 cells. We have several thousand under test and they are showing promise for long cycle life performance. Although this is an old format these cells are still used in hundreds of devices, from power tools to drones and robots. This will make these devices safer.

Another product is by Nanotech Energy where the current collector is composed of a metalized film, also in 18650 cells. This will be significantly safer as the current collector can shrink in the initial stages of battery thermal runaway, pulling the current collector away from the short circuit and giving enhanced safety. This will be available in the 4th quarter of 2024 and is going to be domestically produced in the USA.

The final product is a standard for e-bikes that is coming out soon. E-bikes are becoming more prevalent because riding them is such a wonderful experience. Around 0.1% of e-bike batteries fail today by going into thermal runaway. Soteria believes that is not acceptable and the risk should be lower, ideally to 1 in 100,000 or even greater. Soteria has conducted a thorough study to understand e-bike batteries. We have autopsied new and used e-bikes batteries and interviewed dozens of people in the supply chain and end-customers. Working with others we have drafted a safety standard for e-bike battery packs. It doesn't mandate Soteria technology but it does require a set of five features that is not currently in e-bike battery packs today. These features will make the packs a lot safer. That standard will be rolling out in August 2024 for voluntary adoption, allowing for global use. New government standards will eventually be introduced that should incorporate Soteria's key points.

RSC: Great I look forward to hearing about it. Can you highlight what members of your consortium are working on?

Brian: When we started Soteria in 2017 it was really the "Soteria technology development club", but we realised the industry needs safety for safety sake, so we pivoted the consortium to safety in general. One beautiful thing about safety technologies is that they stack and can be integrated together to make the whole system safer. Just look at automotive products, its much safer to drive today compared to 40 years ago due to seat belts, anti-lock brakes air bags and so on. In comparison with electric vehicles the energy density is going to go up 3 or 4 times from the current state. 500 $W.h.kg^{-1}$ will be expected to be the norm in the future. Safety management will be essential for these products. This could be achieved through the inclusion of Soteria's safety separator, current collector or other technologies. We want to be a part of the future safety infrastructure.

Soteria is encouraging safety by promoting an open dialogue, using webinars, newsletters and meetings. This dialogue allows us to see gaps where Soteria can step in such as e-bikes and training. As an example we are working with a training company to set up some online battery safety training resource. They are doing

training in general but with this joint effort we are going to focus on battery safety. In the USA, there are predicted to be over ~1 million new employees to work on batteries. They will need training from basic topics (such as not disposing of lithium metal in the same waste bin as a coffee!) to more advanced training. This training resource gets people from zero to one and should be available online in 2025.

We also promote an active dialogue through webinars and conferences. Every year we have the LithiumSAFE conference. This year we plan to ignite a cell phone battery, laptop battery, garden tool battery, and even a golf cart battery! The cell phone should burn for a few minutes but the golf cart is certainly going to be more dramatic!

RSC: A golf cart battery pack going up in flames will be quite a sight!

Brian: Yes it should be. We talked about an electric vehicle fire but we are not quite ready for that, maybe in 2025! We are inviting first responders and hopefully this is going to be insightful for them to experience an incident in a controlled environment.

RSC: What innovation projects are Soteria working on?

Brian: When we were studying the e-bikes, I heard a sad story about an individual who lived in Brooklyn with his family. He would ride his e-bike into Manhattan every day and lock it up in his apartment at night. Unfortunately, a battery fire started and there were resultant fatalities. As we know batteries can self-ignite during thermal runaway. This could be caused by an internal defect or damage that has happened hours or days or weeks prior to the event. The central theme is heat and the battery starts heating uncontrollably. Initially the cell's chemistry is breaking down and generating gases. The electrolyte is evaporating, building up pressure and eventually the cell will vent allowing gases to come out. It lowers the amount of flammable electrolyte in contact with the battery and makes the battery less likely to catch fire. Sometimes this will prevent a battery fire but often, it will ignite. Gases that come out are completely undetectable by a convectional smoke detector. At cell vent if you stop the charge you reduce the heat and this can prevent the battery

catching fire. We have taken this knowledge and have created a lithium-ion battery fire detector device. It's based on gas sensors that will halt charge if hydrogen, carbon dioxide and volatile organic compounds are detected. This device plugs into the wall and you can plug your battery charger into it. It will do two things differently, firstly it will set off a noise which is different from a smoke detector. This is so users and first responders coming into the area know there are flammable gases. Secondly, it will give an early warning (between 3-15 minutes) of a battery fire. We will have the product available for pre-order in 2024 and will ship either in 2024 or 2025. Once the technology is out there this will allow for others to integrate it and develop it within their systems.

RSC: Great sounds essential for anyone with an e-bike. Finally - What advice do you have for someone looking to break into the lithium-ion battery industry?

Brian: Interesting question! First I would say it's a great industry to get into. Batteries are the new oil and gas in terms of providing energy to remote applications! The industry is growing so there are lots of jobs. Although it's globally big it's still in its infancy, so make friends, try and do some really good work and try to have impact in the industry. Your career may transition over 3 or 4 companies over the course of a few decades, but you can have a fine career doing that. For early careers focus on your contribution and that will be recognised by other folks out there. It's an industry that really believes in its mission and being mission orientated it will resonate with individuals.

The interview was conducted between Charles Cummings [3] and Brian Morin on the 10th May 2024. The RSC Newsletter editors would like to thank Soteria for taking the time to contribute to this article.

References

[1] Virtual interview held between Charles Cummings and Brian Morin the 10th May 2024

[2] Soteria, website: https://soteriabig.com/

[3] QinetiQ Power Sources, website: www.qinetiq.com/power

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CSC Fellowships

Dragos Neagu[a], Aruna Ivaturi[a] and Sudipta Roy[a]

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(email: sudipta.roy@strath.ac.uk)

Since 2023, the University of Strathclyde has acted as hosts for CSC Professional Fellows. These are three-month professional development offered to Commonwealth partner nations. The Fellows are nominated and selected centrally by CSC for "Science and Technology for Development," for a 4-month stay between February to May 2024.

Dr. Ajeet, Dr. Afaf Ali, Dr. Anand G. Chakinala, and Dr. Praveen, who won Fellowships in 2024, showcased their expertise and passion for sustainable solutions. All fellows attended various professional development courses at different institutions in the UK, contributed to research group discussions and seminars, gave talks on their research and professional topics.

Dr. Ajeet's work on tungsten oxides for photovoltaic applications earned him the 3rd best poster presentation award at the prestigious PVSAT 2024 conference. He actively networked with industry professionals and potential collaborators at the ChemEngDay 2024 conference. Afaf Ali actively participated in workshops and webinars focusing on hydrogen energy and sustainability. She delivered an insightful talk titled "Navigating the path towards Hydrogen Economy-Opportunities and Challenges" and participated in the "Empowering Women and Girls in Business" event and the "Europe in Action-2024 Conference".

Dr. Anand G. Chakinala attended the ChemEngDayUK24 conference at Imperial College London and the New Directions in Molecular Scattering Faraday Discussion in Edinburgh. He contributed to research group discussions and design project meetings, establishing valuable connections with bioenergy professionals

across UK universities. Dr. Praveen participated in the Unicamp-Strathclyde Workshop on Innovation in Sustainable Materials and Energy and visited the CMAC Future Manufacturing Research Hub to gain technical knowledge in flow synthesis. He delivered a talk on "Non-linear Push-pull chromophores: New Horizons in Organic Photovoltaics".

Strathclyde is grateful for the Fellows' dedication to sustainable development and collaborative spirit have truly made a positive impact and we are certain they will have immense and lasting impact in their home countries and institutions. It may be useful to have inter-university collaborations on CSC Fellowships.

For interested parties we suggest a visit to:

https://cscuk.fcdo.gov.uk/scholarships/commonwealth-professional-fellowships/

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Electrochem2023, Unviersity of Bristol

A note from the editors

In 2023 the Electrochem23 national conference was held at the School of Chemistry University of Bristol. The conference was supported by the Royal Society of Chemistry's Electrochemistry, Electroanalytical Sensing Systems interest Groups, and the Society of Chemical Industry's Electrochemical Technology group and the Institute of Corrosion.

Electrochemists, Electrochemical Engineering and Corrosion Specialists from national and international groups gathered to present and discuss new insights into electrochemical science and their latest research results.

Through parallel sessions numerous topics within Fundamental and Applied Electrochemistry, was discussed across five broad themes including:

1. Advances in Electrochemical Energy Conversion and Storage
2. Photo-electrochemistry and Sustainable Electrochemical Transformation
3. Electrochemical Sensors and Electroactive Porous Materials
4. In-Situ Spectro-electrochemistry and Interfacial Electrochemistry
5. Corrosion Science and Technology

As part of the conference a number of invited lectures and awards were presented including:

- RSC Faraday Medal Award: Professor Yitao Long - Unravelling the Nanopore Electrochemistry Landscape: My Academic Journey
- ICORR UE Evans Award: Professor Nick Birbilis - Towards sustainable corrosion resistant alloys
- RSC Parsons Medal Award: Professor Robert S. Weatherup - Revealing Reactions at Buried Electrochemical Interfaces with X-ray Spectroscopies

The editors would like to thank the Electrochem2023 organization committee of Professor David J. Fermin(Chair), Dr Alastair Lennox, Izzy Khalek and Stephen Sweeting (all University of Bristol) for organizing the conference.

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Electrochem2024

Electrochem2024, Manchester Metropolitan University

Dr Yagya N Regmi[a]

[a]Chair Electrochem2024, Reader in Energy conversion and Storage, Manchester Metropolitan University, Manchester

(email: Y.Regmi@mmu.ac.uk)

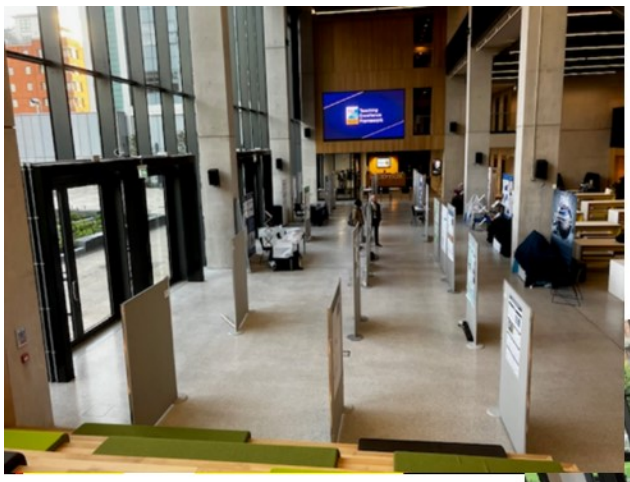
Electrochem2024 was successfully hosted at Manchester Metropolitan University (ManMet) from 11th to 13th September 2024. Electrochem2024 was the first event held at the new state-of-the-art John Dalton Science and Engineering Building at ManMet. This year, the annual conference was jointly organised by the Royal Society of Chemistry (RSC), Institute of Corrosion (iCORR) and the Society of Chemical Industries (SCI). There were 202 registered participants with 97 oral presentations and 69 posters. Additionally, there were 9 exhibiting sponsors with 17 industry professionals showcasing their latest products and technologies. The presentations (oral and posters) were categorised into five thematic symposiums: corrosion, sensors, sustainability, energy and general electrochemistry. Oral presentations were organised into 5 parallel sessions based on the thematic symposiums while the posters from each theme were co-located around the exhibition arena.

The conference opened on 11th Sept with an evening reception and a brief welcome message from Dr Yagya N Regmi, Chair Electrochem2024 and Reader in Energy Conversion and Storage at ManMet. The official programme kicked off on 12th Sept with a welcome address from Prof Mark Sterling, PVC for Science and Engineering at ManMet. The scientific programme was opened with the presentation of the Faraday Medal from RSC to Prof Bilge Yildiz from Massachusetts Institute of Technology followed by the award lecture. Similarly,

Prof David Shoesmith, Western University Canada, was presented with the iCORR UE Evans Award followed by the lecture. The annual general meetings for SCI and the RSC Electrochemistry Interest Group and the joint annual meeting with SCI were also held after the oral presentations for the day. The first day of the conference concluded with a gala dinner at the historic Midland Hotel in the centre of Manchester.

Research presentations, including awards and associated lectures continued on the second day of the conference. The UKRI Circular Chemicals Economy Centre organised two sessions within the sustainability symposiums including an invited lecture from Prof Jin Xuan, University of Surrey. Prof Andrea Russell, University of Southampton, presented the Fleishman Lecture for the RSC, and Prof Nigel Brandon, Imperial College London, was awarded the Castner Medal by the SCI followed by the presentation of the Castner Lecture. The awards and the scientific presentations concluded with the presentation of the Geoffrey Barker Medal from RSC to Prof Ifan Stephen, Imperial College London, followed by the lecture. Several student/PDRA awards and prizes were also awarded at Electrochem2024. The Sheelagh Campbell Award from RSC was won by Xinyu Liu from the University of Cambridge, the SCI poster award by Jessica Pimlott from ManMet, and the PCCP best poster award by Aleksandr Kurilovich from Israel Institute of Technology. There were additional prizes for various competitions from exhibitors such as the poster prizes from Metrohm that went to Marilia Barreto Dalla Benetta from Maynooth University and Joshua Tully from the University of Warwick, and putt-putt golf prizes from Alvatek.

On behalf of ManMet and the City of Manchester, we would like to thank RSC, SCI and iCORR for giving us the opportunity to host the conference at our university and host all the visitors in our city. We would also like to thank all the session chairs, award and prize judges, staff at ManMet and Midland Hotel, and to all the attendees who came to Manchester from the UK and Ireland, and from as far away as Canada, South Korea, Zambia and Australia.



Photographs of the reception hall and poster area

A note from the editors

The editors would like to thank the Electrochem2024 organization committee of Dr Yagya N Regmi (Chair), Dr Tengfei Li, Dr Edward Randviir, Dr Samuel Rowley-Neale and Dr Robert Crapnell (all ManMet) for organizing the conference.

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Regional Postgraduate Symposium Great Western Electrochemistry 2024, University of Bath

Frank Marken[a]

[a] **Department of Chemistry, University of Bath, Claverton Down, Bath**

(email: f.marken@bath.ac.uk**)**

As an annual event, the Great Western Electrochemistry Meeting 2024 took place on Monday 17th June 2024 at the University of Bath. This meeting allows PhD students and early career researchers to present and discuss research linked broadly to electrochemistry. This year, the topic energy storage and future battery technologies dominated, but some presentations also addressed new techniques for fuel cells, water electrolyser technology for hydrogen, and the use of electricity in molecular and organic/biomass chemical transformation.

Contributions from Bristol, Birmingham, Cardiff, Exeter, Southampton, Swansea, and Bath with further industry contributions from FTPhydrogen and from Johnson-Matthey provided a rich basis for discussion during coffee-fuelled breaks. There were four companies supporting the event with exhibits and displays of new equipment.

Poster prizes were awarded for best posters to Nathan Harrison (Cardiff University) for the poster entitled "Assessment of hydrogen evolution reaction with Cu oxides for the CO2 reduction reaction: the influence of the support", to Valentina Corsetti (University of Bristol) for the poster “Exploring CZTSSe stability for PEC hydrogen evolution: the effect of ultrathin ALD protective layers”, and to Cheng Lyu (University of Exeter) for the poster entitled “Electrodeposition of NixSy catalyst for hydrogen evolution reaction in anion exchange membrane water electrolyser”.

Prizes for talks by PhD students were presented to Mike Jones (University of Exeter) for “Improving the performance of transition metal-based electrocatalysts for anion exchange membrane water electrolysers” and to Thom Harris-Lee (University of Bath) for “Scanning electrochemical cell microscopy (SECCM) in catalysis”. The RSC prize for the best talk was awarded to Izzy Khalek (Bristol University) for “Understanding the activity of LaxSr1-xCoO3 perovskite oxides for the oxidation of biomass-derived 5-hydroxymethylfurfural”. The day concluded with a photograph in the sun and further refreshments and discussion.

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2023 Early Career Researcher, University of Galway - 1st December 2023

Dónal Leech[a]

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(email: donal.leech@universityofgalway)

The 2023 Early Career Research Regional Symposium on Electrochemistry, sponsored by the International Society of Electrochemistry and co-sponsored by the Electrochemistry Group of the Royal Society of Chemistry, was held at the University of Galway on 1st December 2023 welcoming ***80 early career, and some established, researchers*** working in electrochemistry across Ireland and Northern Ireland to present on and discuss research and careers. The event was provided for free, with ***no registration fee requirement***, thanks to the sponsorship of ISE and RSC and financial support of Analog Devices Ireland, Metrohm Electrochemistry, Alvatek and the School of Biological & Chemical Sciences of the University of Galway.

The Galway organising committee listed below, with advice from ISE regional representative Micheál Scanlon (University of Limerick) and the host of the 2022 event Paul Kavanagh (Queen's University Belfast), put together a programme featuring a Keynote Lecture, Career talks, and oral and poster presentations by early career electrochemists.

Prof. Dónal Leech (Chair)	Dr. Catalina Vallejo Giraldo	Dr. Rakesh Kumar
Ms. Reshma Kidayaveettil	Dr. Juan Castilla Archilla	Mr. Praveen Kumar

The programme arranged for all oral presentations in a single venue and an extensive (> 30) poster session (with tea/coffee and lunch buffet) in a large foyer

adjacent to the oral presentation venue. This permitted attendees to experience the full breadth and depth of exciting research in electrochemistry from across the island of Ireland.

Each oral session was chaired by an early career electrochemist and a panel of established electrochemists evaluated the excellence of oral and poster presentations for award of prizes.

A participant's (Ian Seymour from UCC – many thanks Ian!) viewpoint of the symposium is presented in Appendix 1.

The symposium opened with a brief informal welcome by Professor Leech, setting the scene and tone for the days proceedings, highlighting that the symposium provides the opportunity to:

- Connect with fellow early-career electrochemists
- Discover the latest research in electrochemistry from across Ireland
- Develop presentation skills in a supportive and collegial environment

The first session started with a keynote lecture by Professor Carmel Breslin (Maynooth University and an alumna of University of Galway) on recent results on fabrication and applications of materials based on transition metal dichalcogenides.

This session also included fascinating and illuminating career stories of senior electrochemists: Richard Doyle of Analog Devices Ireland and Joanne Holmes of Metrohm Electrochemistry.

The remainder of the day was busy and engaging featuring oral and poster presentations, from early and later stage PhDs as well as post-doctoral researchers, and discussions amongst all attendees.

The symposium lunchtime photo, below, taken on the steps outside the Orbsen building on the banks of the River Corrib captured most of the attendees. See if you spot any familiar faces in the crowd!

The awards, consisting of a certificate and €50 amount to defray the cost of annual membership of the International Society of Electrochemistry, were presented after much deliberation and debate by the panel to those listed overleaf.

The concluding remarks, by the ISE Regional Representative, thanked all attendees for their participation and encouraged every electrochemist to join, and engage with activities of, the International Society of Electrochemistry.

The event finished with an invite to Sult, the student-run bar on campus, for some ‘refreshments’ and with the welcome news that Maynooth University had ‘volunteered’ to host the 2024 symposium. We wish the team in Maynooth every success with the 2024 symposium.

Best oral presentation Apinya Ngoipala, University of Limerick

pictured with Professor Carmel Breslin, Keynote Lecturer

Runner-up oral presentation Ehren Dixon, University College Cork

pictured with Professor Carmel Breslin, Keynote Lecturer

Best poster presentation Marc Brunet Cabre, Trinity College Dublin

pictured with Professor Micheál Scanlon, ISE Regional Representative

Runner-up poster presentation
Oisín Foley Doyle, Dublin City University

pictured with Professor Micheál Scanlon, ISE Regional Representative

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Report on the Symposium "Fraser Armstrong Pt Jubilee: A Meeting of Minds, Mechanisms, and Memories"

Alison Parkin[a],

[a]Department of Chemistry, University of York

(email: alison.parkin@york.ac.uk)

Professor Fraser Armstrong, FRS, has recently turned 70, acquired Emeritus status at the University of Oxford and been awarded a 2023–25 Mok Hing-Yiu Distinguished Visiting Professorship at Hong Kong University. In honour of his distinguished career, with particularly notable advances in bioelectrochemistry, a scientific symposium and dinner was held at St John's College Oxford across 22nd and 23rd August 2024. The RSC Electrochemistry Group very kindly provided £150 sponsorship to support the event, and this contributed towards 12 early career researchers being able to attend (2 PhD students and a PI from Taiwan; 2 PDRAs and 5 PhDs from York; and a DPhil and Fellow from Oxford). The event organisers, Rhiannon Evans (HydRegen), Clare Megarity (University of Manchester) and Alison Parkin (University of York) are very grateful to all the participants and sponsors for their support of a very engaging and enjoyable two-day event.

The meeting was designed to both celebrate the substantive scientific contributions Fraser has made to understanding and harnessing the redox mechanisms of life and recognise his enormous contribution to championing and supporting those who worked for and with him. The event was therefore a gathering of friends and colleagues, with 104 guests from across the globe (Australia, USA, Germany, France, Taiwan, China etc…). The 19 speakers showcased the long-running record of Fraser's influence, with Professors Julea

Butt and Judy Hirst (FRS) representing senior world-class researchers who were mentees of Fraser at the very start of his career, and some of the more recent “Armstrong Group” leavers showing how Fraser’s legacy will include new structural insights into complex metalloenzymes, anticancer therapies and continued development of the “e-leaf”.

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Future conferences:

Electrochem2025

International Society of Electrochemistry

Below is the list of ISE conferences listed online:

2025
25-27 March, Natal, Brazil (39th ISE Topical Meeting)
The role of electrochemistry in sustainable energy and the environment
(**more information**)

15-17 August, Changchun, China (40th ISE Topical Meeting)
(**more information**)

7-12 September, Mainz, Germany (76th Annual Meeting)
Electrochemistry: From Basic Insights to Sustainable Technologies
(**more information**)

2026
Sydney, Australia (77th Annual Meeting)
(**more information**)

2027
5-10 September, Glasgow, UK (78th Annual Meeting)

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Sponsors

Many thanks to our generous sponsors for supporting this conference:

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Where science meets business

Electrochemical Technology

The Electrochemical Technology Technical Interest Group is involved in all aspects of the application of electrochemical science and engineering. The Group's aim is to promote research and development of electrochemistry which leads to the production of appropriate technologies and industrial and consumer products. The Group provides an interface between academia and industry and is a forum for promoting research and collaboration between a range of scientific and engineering disciplines.

Industrial sectors

Electrochemical activities cut across all industrial sectors, including chemical, pharmaceutical, electrical, electronic and micro-electronic, information technology, mining and metallurgical, biotechnology, transportation, medical, water and wastewater. As such, the Group's interests include applications of electrochemistry in:

- sensors and monitors
- energy conversion and storage
- synthesis of chemicals, pharmaceuticals, biochemicals, polymers and electronic materials
- materials protection, processing and fabrication
- environmental protection and control

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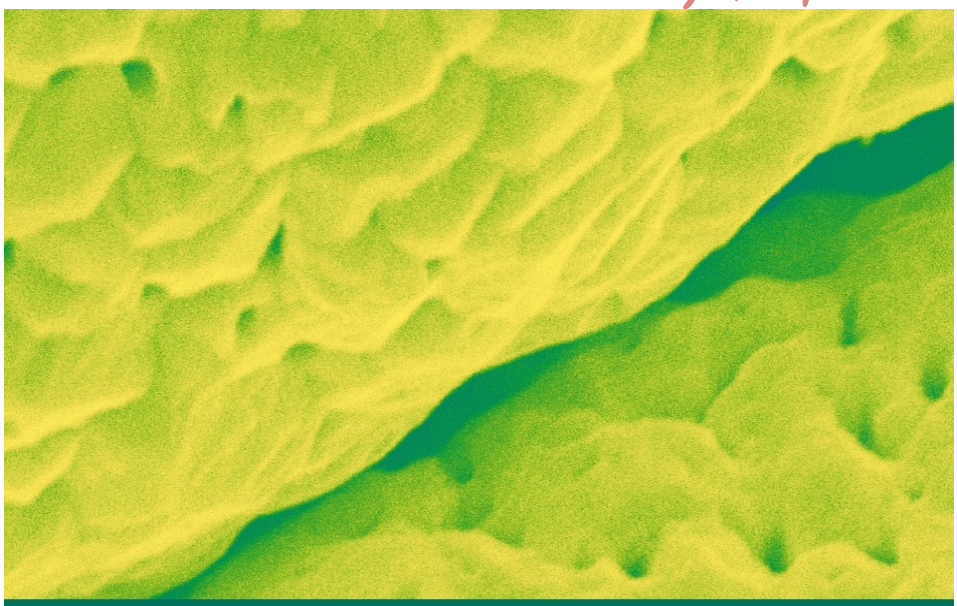
RSC Electrochemistry Group



RSC Electrochemistry Group

This RSC Group is part of the Faraday Division, involved in all aspects of electrochemical processes (fuel cells, energy sources, analytical devices and sensors, electrochemical planting and synthesis, fundamental research etc).

Activities:

- The Group organises the annual 'Electrochem' meetings (Faraday Medal) to reward outstanding international scientists. For up-to-date information, go to the RSC's web pages for the Electrochemistry Group.
- The Electrochemistry newsletter: available quarterly, in pdf, from our RSC web pages, it highlights events' reports and general sector's news and insights.
- Student bursaries: to support/encourage graduate students giving lectures on their PhD work at national and/or international conferences.
- Outreach: activities involving the public and schools to raise awareness of the fundamental importance of electrochemical processes today.

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The Electroanalytical Sensing Systems Group

The Electroanalytical Sensing Systems Group is one of the RSC's many Interest Groups. The Interest Groups are member driven groups which exist to benefit RSC members, and the wider chemical science community, in line with the RSC's strategy and charter.

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ALVATEK Electrochemistry Product News

EmStat3 blue

- 8 hours of batterylife
- USB or Bluetooth communication
- potential range of ±4V
- current ranges from 1 nA to 100 mA
- ideal for sensor applications

Optional:

- 8 or 16 channel multiplexer
- stirrer control
- Pt1000 temperature sensor
- differential electrometer amplifier

PalmSens
Compact Electrochemical Interfaces

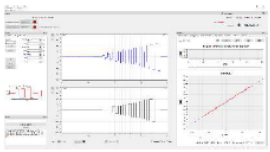
ALVATEK

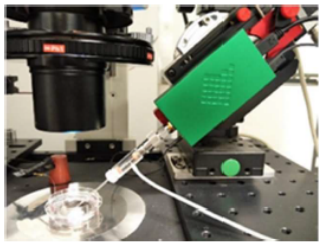
Alvatek Ltd, Unit 48 Basepoint Business Centre, Premier Way,
Abbey Park Industrial Estate, Romsey, Hampshire, SO51 9AQ
Telephone: 0800 566 8228 Fax: 0870 751 5064
Email: info@alvatek.co.uk www.alvatek.co.uk

Electrochemistry Solutions - What's New?

Elements Ultra low noise current amplifiers for nanopore and electrophysiology research.

Alvatek is now the official UK distributor for Elements Srl products. Elements specialises in pico- and nano-scale electrochemistry measurements ranging from live cells to bio- and solid state nanopore sensing.





PalmSens Sensit BT– Handheld, wireless dual channel potentiostat with EIS to 200kHz

- Dual channel / Bipotentiostat
- EIS to 200kHz
- Current Ranges 100nA – 5mA (3mA max)
- USB / Battery Power
- £1.5K ex VAT

Ivium pocketStat2– handheld potentiostat with EIS to 1MHz

- Low noise design with 100pA current range (optionally 10pA)
- EIS to 100kHz and current to 30mA
- Optional battery and BlueTooth.
- < £3.5K ex VAT

OctoStat30– 8 independent potentiostats each with EIS.

For applications requiring simultaneous EIS measurements on multiple cells. (also for multichannel battery cycling with Ivium's new **CycliScan** software)

- 30mA per channel
- EIS to 100kHz (NEW option to 1MHz)
- Are £1.5K per channel ex VAT

ALSO...

We are pleased to offer MICRUX microfluidic cells, sensors and platforms to complement our BASi range.

We are now the official UK distributor for EL-Cell battery fixtures and cells (more in our Energy News page in this newsletter.

For more information: www.alvatek.co.uk

Email: info@Alvatek.co.uk
Call us on: 0800 566 8228

New Product Information

ALVATEK

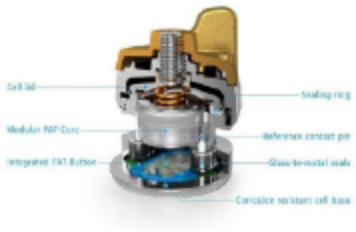
Alvatek Ltd, Unit 48 Basepoint Business Centre, Premier Way,
Abbey Park Industrial Estate, Romsey, Hampshire, SO51 9AQ
Telephone: 0800 566 8228 Fax: 0870 751 5064
Email: info@alvatek.co.uk www.alvatek.co.uk

Energy Research Solutions - What's New?

EL-Cell – battery test cells & fixtures

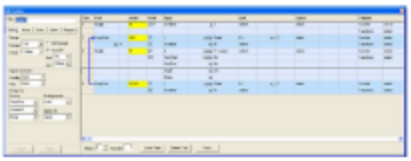
Alvatek is now the official UK exclusive distributor for El-Cell GmbH. El-Cell's unique combination of Electrochemistry and mechanical engineering expertise is evident in its innovative and high quality range of cells, systems and dilatometers for battery research.

- Test Cells
- Temperature chambers
- Precision Tools: cutters and punches
- Dilatometers



Ivium CycliScan – cycler software

Included IviumSoft, Ivium's electrochemical software, CycliScan provides a look and feel familiar to battery researchers. Also adds functionality (such as **drive cycle simulation**) and safety features essential for battery research.



IVICycle – 32 channel cycler with EIS

This **32 channel multi-potentiostat / battery cycler** includes independent EIS per channel and both Cycler and Electrochemistry capabilities.

- 30mA to 5A per channel (16A with booster).
- Per-channel costs start around £1K.

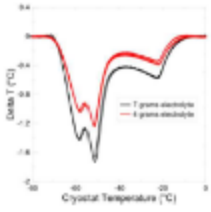
IviCycler

NanoCycler – 8-channel cycler

- 10mA per channel OR
- 100mA max per channel
- Including software < £4,000 total

Non-destructive Electrolyte Measurements

Novonix's Differential Thermal Analysis (DTA) system enables the reliable measurement of the evolution of liquid electrolyte in lithium-ion cells and other electrochemical cells.



Electrolyser Test Systems

Scribner's new 600ETS and E857 systems flexibly address electrolyser researcher requirements across a wide range of materials, liquids and gases.

For more information: www.alvatek.co.uk

Email: info@Alvatek.co.uk
Call us on: 0800 566 8228

New Product Information

PalmSens
Compact Electrochemical Interfaces

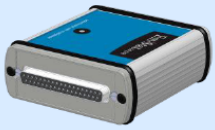
PalmSens3

Potentiostat / Galvanostat / Impedance Analyser

EmStat3 and 3+

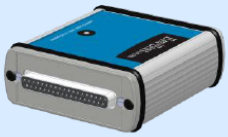
Potentiostat

EmStat3 MUX8



EmStat3 with integrated
8 channel multiplexer (MUX8)

EmStat3 MUX16



EmStat3 with integrated
16 channel multiplexer (MUX16)

MultiEmStat3

4 channel multipotentiostat
with EmStat3 modules

MultiEmStat3 and 3+

4, 8 or 12 channel multipotentiostat
with EmStat3 or EmStat3+ modules

EmStat3 4WE

Polypotentiostat for use with up to 4
working electrodes.

Distributed in the UK by

ALVATEK

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Email: info@alvatek.co.uk
www.alvatek.co.uk

New Product Information

WHISTONBROOK TECHNOLOGIES LIMITED

'experts in electrochemical equipment'

Tel: 01582 434252 **www.whistonbrook.com**

Whistonbrook Technologies design, manufacture and supply a full range of standard and custom potentiostats and other electrochemical instrumentation to meet all your needs.

Analogue Potentiostats

- Low noise analogue potentiostats
- Single channel and dual channel units
- Current ranges from 1nA to 10mA

Prices from £1990

Point of Care (POC) and Medical Diagnostic Instrumentation

- Instruments and software developed for medical diagnostic sensors

Electrochemical Instruments for Student Experiments

- Potentiostats
- Amplifiers for Neuroscience
- Galvanostats
- High impedance buffer amplifiers
- Loads for fuel cells
- Analogue and Digital

Prices from £325*

*cost of 20off

Digital Instrumentation with PC software packages

- EzeScan 4 – entry level potentiostat
- EzePG – potentiostat/galvanostat
- Quad potentiostat – four channel potentiostat
- EzeTouch – portable touch screen potentiostat

Prices from £2470

Website	www.whistonbrook.com
Telephone	01582 434252
Email	info@whistonbrook.com

Whistonbrook Technologies Limited, Unit C24, 110 Butterfield, Great Marlings, Luton, Beds, LU2 8DL

Science Instruments

EC-Lab Ltd
www.ec-lab.co.uk

Tel: 01753 8:
Email sales@

MTZ-35

The new benchmark of impedance analyzers

Exploring new frontiers of impedance testing with a wide frequency range impedance analyzer and a full range of ancillary equipment.

MEASUREMENT RANGES

Frequency range	10 µHz to 35 MHz
Inductance	10 nH to 10 kH
Capacitance	1 pF to 1000 µF
Resistance	1 mΩ to 100 MΩ

HIGH END MULTICHANNEL POTENTIOSTAT/GALVANOSTAT

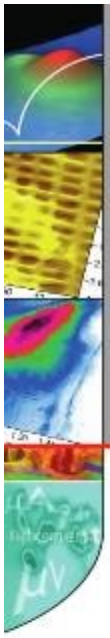
VSP-300

The ultimate versatile multipotentiostat

BioLogic
Science Instruments

APPLICATIONS

- Batteries/supercapacitors
- Fuel cells/photovoltaic cells
- Fundamental electrochemistry
- Corrosion



SensorSTAT

uniscan instruments

The Uniscan SensorSTAT™ is a high quality digital scanning multi-channel potentiostat system. The modular design provides a user configurable system for demanding research applications.

- Configurable for 8 to 14 channels
- Single USB connection controls all channels
- Ultra low noise current performance
- UiEChem™ software supplied with system
- Analogue triggering
- 5-WE multiplexing on each channel
- Interfaces to commercial electrochemical sensors
- User programmable techniques via macro programming
- ActiveX software for LabView™ applications

Uniscan instruments
A BioLogic company

Represented by:
ec-lab

Web: www.ec-lab.co.uk Tel: +44(0)1753 822522
e-mail: sales@ec-lab.co.uk Fax: +44(0)1753 822002

Metrohm Autolab

Metrohm Autolab has been a member of the Metrohm Group since 1999. Metrohm Autolab customers can look expect excellent sales and service support from a dedicated team of Electrochemists based at Metrohm's prestigious laboratories at Daresbury near Runcorn.

Metrohm Autolab produces four different potentiostat/galvanostat lines for a wide range of electrochemical applications, as well as modular extensions, software and accessories.

New Product Information

DROPSENS

Metrohm U.K. Ltd.

µStat 8000P Multi Potentiostat

Ref. STAT8000P

DropSens is proud to announce the launch of the NEW portable Multi Potentiostat µStat 8000P.

Our brand new instrument, of only 22x20x7 cm, includes 8 channels that can act at the same time as 8 independent potentiostats; it also includes one multichannel that can act as a potentiostat where up to 8 working electrodes share an auxiliary and a reference electrode.

With µStat 8000P users can perform up to 8 different electrochemical techniques at the same time; or carry out the study of one technique's parameter in just one step by applying the same electrochemical technique in several channels but selecting different values for the parameter under study. These are just examples of the enormous capabilities that our new instrument offers.

µStat 8000P can be applied for Voltammetric or Amperometric measurements, including 11 electroanalytical techniques. In addition, µStat 8000P owners can later upgrade their instrument to a µStat 8000 by just purchasing an extension. This self-upgrade does not require any hardware modification, but it is implemented by means of a Galvanostat software update kit.

The NEW portable Multi Potentiostat is Li-ion Battery powered (DC charger adaptor also compatible), and can be easily connected to a PC via USB or Bluetooth®.

µStat 8000P is controlled by the powerful software "DropView 8400" which allows plotting of the measurements and performing the analysis of results. DropView software provides powerful functions such as experimental control, graphs or file handling, among others.

Available techniques:

POTENTIOSTAT

Voltammetry

LSV	Linear Sweep Voltammetry
CV	Cyclic Voltammetry
SWV	Square Wave Voltammetry
DPV	Differential Pulse Voltammetry
NPV	Normal Pulse Voltammetry
NDP	Differential Normal Pulse Voltammetry
ACV	AC Voltammetry

Amperometry

AD	Amperometric Detection
FA	Fast Amperometry (t_{pt} < 0.1 s)
PAD	Pulsed Amperometric Detection
ZRA	Zero Resistance Amperometry

Contact us:

email: dropsens@metrohm.co.uk | website: dropsens.co.uk | Tel: 01928 579 600

DROPSENS

Metrohm U.K. Ltd.

µStat 8000P Multi Potentiostat

Ref. STAT8000P

Instrument Specifications

Power	Li-ion Battery (3500 mAh) USB DC charger adaptor compatible (5 V, 3.5 W)
PC interface	Bluetooth® USB
Operating modes	8x 1 Channel Potentiostat 1x 8 Channel Potentiostat
DC Potential range	±4.095 V
Current ranges (potentiostat)	± 1 nA to ± 100 mA (9 ranges)
Maximum measurable current	±80 mA
Rise time	20 µs
Applied Potential Resolution	1 mV
Measured Current Resolution	0.025 % of current range (1 pA on lowest current range)
Potential Accuracy	±0.2 %
Current Accuracy	±0.5 % (current range dependent)
External inputs/outputs	- 5 Digital Input/Output pins (PIO 1, PIO 2, PIO 3, PIO 4, PIO 5) - 3 Analog Inputs multiplexing PIO 1, PIO 2, PIO 3 - 2 Analog Outputs (configurable I-out or E-out)
Indicators	LCD display in front panel
Dimensions	22.2 cm x 20.5 cm x 7.5 cm (L x W x H)
Weight	1.6 kg

Control Specifications

General Pretreatment	Conditioning stage duration:	0 – 1300 s	
	Deposition stage duration:	0 – 1300 s	
	Equilibration stage duration:	0 – 1300 s	
General Parameters	Begin, End, Base, Vertex potentials:	-4.095 V to +4.095 V	
	Step potential:	1 mV to 500 mV	
	Pulse potential:	1 mV to 250 mV	
	Scan rate:	1 mV up to 1.1 V per step	
Specific Parameters	SWV	Frequency:	1 Hz to 400 Hz
		Amplitude:	1 mV to 250 mV
	DPV, NPV, NDP	Modulation time:	1 ms to 1300 ms
		Pulse time:	1 ms to 1300 ms
	ACV	Frequency:	2 Hz to 250 Hz
		Amplitude:	5 mV to 250 mV (RMS)
	Chrono. Methods (AD, ZRA)	Interval time:	0.1 s to 1300 s
		Run time:	Hours (65000 points)
	Fast Chrono. Methods (FA)	Interval time:	1 ms to 1300 ms
		Run time:	Hours (65000 points)
	PAD	Pulse time:	1 ms to 1300 ms
		Interval time:	10 ms to 1300 ms
		Run time:	Hours (65000 points)

Specifications are subject to change without previous notice

Related products


CABSTAT1


CABSTATMULTI


CAST


CAST8X


8X110

Contact us:

email: dropsens@metrohm.co.uk | website: dropsens.co.uk | Tel: 01928 579 600

PARSTAT™ MC

multichannel potentiostat/galvanostat

Protect Your Experiment From the Unexpected

Designed to protect your experiment from the unexpected, the PARSTAT™ MC is the most modular and robust multi-channel electrochemical testing platform on the market. It builds on our industry-leading 50+ years of experience in potentiostat development and software user-interface design.

- The *ultimate* in modular design
- Widest dynamic current range of 2 Amps to 4 nA (120 fA resolution) as standard — No need for expensive hardware options

- Hot-swappable channels allow potentiostats to be added or removed without interruption of experiments on other channels
- Fast data acquisition at 500 kS/sec allows for a wide range of high speed applications

- Features the most popular electrochemical acquisition and analysis software solution, VersaStudio
- Floating ground allows testing of multiple samples in the same cell

Princeton Applied Research

www.princetonappliedresearch.com
pari.info@ametek.com
P: 865.425.1289 F: 865.481.2410

AMETEK

New Product Information

...more an orchestra.

The definitive modular system for electrochemical research, ModuLab delivers sublime performance for a vast repertoire of applications...

High performance 'Plug & Play' modules	●	●	●	●	●	●
64 MS/s smooth scan - LSV, LSF, CV	●		●	●		●
Up to 1 MS/s data acquisition - pulse, CV	●	●	●	●		●
100 aA current resolution	●		●	●	●	●
Up to ±2.5 A current - scan / pulse		●			●	●
±100 V compliance and polarization	●	●	●			●
10 µΩ impedance measurement		●	●			●
>100 TΩ impedance measurement	●		●	●	●	●
Multiple high-speed EIS techniques	●	●	●	●	●	●

solartron analytical

US: Tel: 1-865-425-1380
Fax: 1-865-481-2410
UK: Tel: +44 (0)1252 556800
Fax: +44 (0)1252 556899
Email: solartron.info@ametek.com
www.solartronanalytical.com

AMETEK

ModuLab the new gold standard for electrochemical instrumentation

To compose an electrochemical test system that's totally in tune with your research requirements contact Solartron today.

New Product Information

New Solartron EnergyLab XM for Energy Research

The Solartron EnergyLab XM is an electrochemical impedance workstation designed specifically for energy storage research:

- Batteries
- Supercapacitors
- Fuel cells

New Application-Focussed Product Line

The EnergyLab XM is the first of a new application-specific range of potentiostats from Solartron Analytical (Ametek), with small footprints and affordable pricing. There will be four systems in the range, which will be launched over the coming months.

Follow Blue Scientific on Linked In to receive details of the new instruments as they are announced.

EnergyLab XM

The first product in the series to launch is EnergyLab XM, for impedance testing of a variety of energy storage devices, including the testing of batteries, supercapacitors and fuel cells. The system includes all components required for this area of research, eliminating the need for costly hardware add-ons. The system includes:

- A reference grade potentiostat
- Frequency response analyser (FRA)
- 2A booster

The unit may be operated in boosted or unboosted mode (with automatic switching), providing optimum test conditions and accuracy for a wide range of devices.

EnergyLab XM's extreme sensitivity is ideal for complete characterisation of prototype low current or low impedance new generation cells. If high current is needed, external boosters can be connected and automatically controlled, allowing fully integrated high current tests at up to 100A.

For more information and quotes, please contact Blue Scientific, exclusive distributor for Solartron Analytical in the UK and Ireland, on 01223 422 269 or info@blue-scientific.com

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www.blue-scientific.com

micrux
TECHNOLOGIES

Think & Innovate

Thin-film microelectrodes

» POTENTIAL IN ELECTROCHEMISTRY

Thin-film technologies enable the manufacture of **standard** and **customized** (micro)electrodes with a **low-cost**, **high precision** and **resolution**. Micrux can adapt the electrochemical system to the requirements of the customers applications.

Thin-film accessories: **flow cell** and **universal connector** have been developed to use in combination with these electrodes.

Flow cell

» PROFICIENCY IN MICROFLUIDICS

Micrux has experience in developing capillary Electrophoresis microchips with electrochemical detection and the small and totally portable instrumentation to use them: Holder, iHVStat, miniPump, etc.

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