No. 1 September 2023

NEWSLETTER

Serving Electrochemical Science, Technology and Engineering within the catchment of

The Royal Society of Chemistry
and
The Society of Chemical Industry

RSC INTEREST GROUP
ELECTROCHEMISTRY

SCI
Where science meets business
an environment to advance knowledge exchange

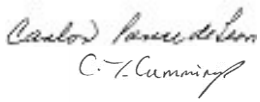
Contents

Editorial

Welcome to the 2023 issue of the Electrochemistry Newsletter. This year has been a busy year with in-person events and meetings, reestablishing old collaborations and connections. In this issue we included conference reports and product information.

A number of reports from both national and international conferences are documented. This includes student travel bursaries from last financial year. Unfortunately, due to budgetary pressures, the RSC Electrochemistry Group have taken the decision to postpone the award of student travel bursaries. However, hopefully this will continue soon. 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:

capla@soton.ac.uk
cycummings@qinetiq.om

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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Electrochem2022

A note from the editors

In 2022 the Electrochem national conference was held at the School of Engineering, University of Edinburgh. The conference was organized jointly by the Royal Society of Chemistry's Electrochemistry and Electroanalytical Sensing Systems interest Groups, and the Society of Chemical Industry's Electrochemical Technology group. The conference also included the 63rd Corrosion Science Symposium organized by 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:

1. Energy and Environmental
2. Biotechnology
3. Electroanalysis and Sensors
4. Fundamental and Applied Electrochemistry
5. Corrosion Science and Engineering

The editors would like to thank the Electrochem2022 organization committee of Dr Ignacio Tudela, Dr Jamie Marland, Dr Ilka Schmueser,Dr Stewart Smith, Dr Jonathan Terry and Dr Justin Elliott for organizing the conference.

Prizes

- **Prof. Beatriz Roldán Cuenya -Faraday Medal and Lecture**

Prof. Beatriz Roldán Cuenya is currently the Director of the Interface Science Department at the Fritz Haber Institute of the Max Planck Society in Berlin (Germany). She is a world-leading expert in the fundamental study of electrocatalysis, with a particular interest in the development of new catalysts for the electroreduction of CO2.

- **Prof. Robert A. W. Dryfe -Geoffrey Barker Medal and Lecture**

Prof. Robert A. W. Dryfe is Professor of Physical Chemistry at the School of Natural Sciences in The University of Manchester. He is renowned for his work on electrochemistry at liquid-liquid interfaces and the study of electrochemical properties and applications of graphene and other 2D materials.

- **Dr. David Hodgson - Castner Medal and Lecture**

Dr. David Hodgson is Founder and Managing Director of TFP Hydrogen Products and CEO of Amalyst Ltd. He is well recognised as a leader in the field of industrial electrochemistry having successfully developed commercialised a number of electrochemical technologies such as advanced coatings and catalysts for fuel cells and the chlor-alkali industry.

- **Prof. Alison Davenport -UR Evans Award and Lecture**

Alison Davenport is Professor of Corrosion Science and Head of the School of Metallurgy and Materials at the University of Birmingham. She is well known for her work on understanding localised corrosion phenomena and passive films by developing and applying advanced in situ characterisation techniques such as synchrotron X-ray methods

- **Prof. Andrew R. Mount - John Albery Memorial Lecture**

Prof. Andrew R. Mount is Professor of Physical Electrochemistry at the School of Chemistry in The University of Edinburgh, where he is also Dean of Research at the College of Science and Engineering. He is well known for his work on a wide range of areas within fundamental and applied electrochemistry, from micro- and nanoelectrode arrays to biosensors and molten salts.

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Regional Postgraduate Symposium Great Western Electrochemistry 2023, 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 2023 took place on Monday 5th June 2023 at the University of Bath. This meeting allows PhD students and early career researchers to present and discuss research linked to electrochemistry. This year, the topic energy storage and future battery technologies dominated, but some presentations also addressed new techniques for pH measurement in sea water, corrosion processes, fuel cells in aviation, water electrolyser technology for hydrogen, and the use of electricity in molecular and organic chemical transformation.

Contributions from Bristol, Reading, Oxford, Swansea, and Bath with further industry contributions from Qinetiq, GKN, and the National Physics Laboratory provided a rich basis for discussion during coffee-fuelled breaks. There were six companies supporting the event with exhibits and new equipment. Prizes were awarded for best posters to Athi N. A. Ramah (Bristol University) for the poster entitled "Structure Activity Relationship of La1-xNdxCoO3 Nanoparticles towards Oxygen Electrocatalysis" and to Tingran Liu (University of Bath) for the poster entitled "Green Electrosynthesis at Interdigitated Electrodes: Reaction Zones for Olefin Hydrogenation". Prizes for talks were presented to Rob Gray (University of Bath) for the talk entitled "Carbon Fibre Electrodes for Structural Batteries" and to Elisabettamaria Schettino (University of Bath) for the talk entitled "Ceria and

Yttria Doped Barium Zirconate Fabrication Methods for Green Energy Devices". The first prize went to Dan Gillard (Swansea University) for the talk entitled "MVD Al2O3 Coatings on Copper to Promote Dendrite free Electrodeposition of Sodium for Anode free Sodium Ion Batteries". The day concluded with refreshments and further discussion.

Great Western Electrochemistry Meeting 2023

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Student conference report: Electrochemistry 2022, Berlin, Germany, 27-30 September 2022

Lina Wang[a]

[a]**Frank Marken Group, University of Bath, Bath, UK**

The conference Electrochemistry 2022, organised by the GDCh committee, has been successfully held in Berlin. It provided an excellent opportunity for all the participants to catch up on new ideas and communicate. There were different divisions, including Electrocatalysis, Batteries, Fundamental and Theoretical electrochemistry, Interfacial Electrochemistry, Bioelectrochemistry, Photoelectrochemistry, CO_2 Reduction, and Electroanalysis and Sensors. Another brilliant thing is the division of Young Electrochemists' Pitches. Early PhD chemists and Master students presented their work.

There were terrific plenary talks throughout the conference as a kick-off to each day. Prof Shelley D. Minteer gave a presentation about Bioelectrocatalysis for Electrosynthesis. Her research focused on improving the abiotic-biotic interface between biocatalysts and electrode surfaces for enhanced bioelectrocatalysis. In enzymatic electrobiocatalysis, an artificial redox mediator is often required to observe significant electron transfer rates. However, the use of such mediators can obfuscate the protein's native kinetics. Minteer's group discovered material for facilitating direct electrochemical communication with redox proteins based on a novel pyrene-modified linear poly(ethyleneimine). By immobilising the catalytic subunit of nitrogenase (MoFe protein), an ATP-independent direct electroenzymatic reduction of N_2 to NH_3 was achieved.

As one of the presenters, Lina Wang gave a talk about Artificial Formate Oxidase Reactivity with Nano-Palladium Embedded in Intrinsically Microporous Polyamine (Pd@PIM-EA-TB) Driving the H_2O_2 – 3,5,3',5'-Tetramethylbenzidine (TMB) Colour Reaction. Palladium nanoparticles immobilised in an intrinsically microporous polymer are described to convert oxygen into hydrogen peroxide in the presence of HCOOH, similar to the formate oxidase reactivity. The sensor dye, TMB, was used to give colourimetric evidence for H_2O_2 production. Computational modelling based on DFT calculation proved that the PIM-EA-TB acts as an active component and enhances the catalytic performance of palladium catalysts.

Figure 1. Lina Wang presenting her work.

It is a brilliant experience to be part of the conference in person, especially after the corona gap. Thanks to the members of the GDCh committee for organising everything. Thanks also go to the RSC Electrochemistry Group for their funding support.

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Student conference report: Gordon Research Conference – Electrochemistry, California, USA, 11-16 September 2022

Orielia Egambaram[a]

[a] **Interfacial and Synthetic Chemistry (SISC) Group, University of Kent, Kent, UK**

After much deliberation, and uncertainty due to COVID-19, Ventura, California welcomed the 2022 cohort of enthusiastic electrochemists at the 51st Electrochemistry Gordan Research Conference (GRC). This conference also had an associated Gordan Research Seminar (GRS), held the day prior, which was in its 12th year of existence. This seminar, organized by and directed at young researchers (PhDs and Post-Docs), serves as a brilliant means to develop long lasting connections within the field of electrochemistry.

I had the most memorable time at the GRC/S and the connections that I have forged will certainly benefit the further development of my skills and the enhancement of my understanding in this field. This opportunity for young researchers to speak freely during the seminar and to build confidence as we navigate academia was phenomenal. Through stimulating conversations over breakfast and so forth, I found solidarity in the shared struggles endured in research. Scientific research in academia is often an isolating journey, and merely having ones difficulties affirmed can do wonders for future endeavours.

I particularly enjoyed the relaxed environment that prevailed throughout the conference and seminar, and I believe that this made the event more enjoyable. Even when the conference kicked off on the 11th, and more established researchers arrived, the environment remained inclusive.

A highlight for me was the GRC "Power Hour" which as the name states, is an hour-long session aimed at addressing diversity and inclusivity. The discussions held

during this session were very informative and they were a clear indication of the GRCs intent to drive inclusivity and enhance the overall experience of participants. Such initiatives enhance one's sense of self and belonging, which subsequently builds confidence.

The work by Dr. Will Tarpeh and the Tarpeh group at Stanford was intriguing, especially given the long-term applications of the research. During his talk, Dr. Tarpeh highlighted the use of electrochemistry, in conjunction with thermodynamics and kinetics, to source reactive nitrogen species from "waste"-water supplies. Dr. Tarpeh further highlighted the significant role played by the electrolyte, electrode surface and electrocatalyst in the selectivity and electrochemical activity of each process. Overall, the group focuses on improving the sustainability of known engineered processes.

Another notable speaker was Dr. Debra Rollinson, head of the Advanced Electrochemical Materials Section at the Naval Research Laboratory (USA). With over 3 decades of research experience, Dr Rollinson was an absolute fountain of knowledge, extending beyond electrochemistry.

Prior to GRC/S, bipolar membranes were an unfamiliar area to me. Thanks to the talk by Dr. Shannon Boettcher, and several posters observed, I understand the immense value that these provide. Bipolar membranes are useful in several applications and were of particular interest to me as they might mitigate the issue of pH fluctuation observed in redox flow batteries. The use of a bipolar membrane allows the coupling of vastly different electrolytes in a flow battery system.

Attending the GRC/S, and having the opportunity to present my PhD research, was a awe-inspiring experience. This opportunity would not have been possible without the financial support of the RSC Electrochemistry Group. I would greatly encourage other members to attend further instalments of this conference.

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ISE-2022

Student conference report: International Society of Electrochemistry Conference – Xiamen, China, 10-15 October 2022

Pallavi Dutta[a]

[a]**Robert Johnson Group, School of Chemistry and Chemical Biology, University College Dublin, Belfield, Dublin, Ireland.**

The International Society of Electrochemistry (ISE) holds an annual conference for electrochemists around the globe to come together and discuss recent advancements in the field of electrochemistry, including microfabrication, sensors, energy storage and conversion, and environmental technologies. This August, I attended and presented my work entitled " the effect of electrolyte concentration and pore size on Ion Current Rectification (ICR), a phenomenon observed in asymmetrical nanopores" in the conference.

The conference had seven parallel sessions covering different aspects of electrochemistry. The majority of the seminars I attended focused on bioanalytical chemistry, which closely aligned with my area of interest and current PhD project. At this conference, I had the privilege to hear Dr. Nako Nakatsuka speak about her research using Aptamer-Modified Nanopipettes for Small-Molecule Biosensing, specifically for the detection of serotonin. She discussed in great detail the challenges associated with finding the appropriate tools to monitor chemical signalling in the brain at high spatial resolution and how her current work aims to solve this issue by combining the selectivity of the aptamers with the sensitivity of nanoscale openings up to 10 nm. Dr Nakatsuka's discussion on the use of aptamers for serotonin detection peaked my interest greatly as my current research project also uses aptamers for pesticide detection. In her research, the presence of the negatively charged backbone of aptamer sequences immobilized on the nanopipettes resulted in a negatively rectified current-voltage curve, which was

then further rectified upon target binding. I also learned new techniques such as quartz crystal microbalance dissipation and circular dichroism spectroscopy that can be used to monitor the surface functionalization and structure switching of aptamers on the internal walls of nanopores.

At the ISE conference, I presented my work in both two-minute flash and poster presentation session. My poster was based on my recent publication on studying the effect of electrolyte concentration on ICR where ICR inversion below unity at lower electrolyte concentrations was observed for the first time experimentally. My work was inspired by the by the work carried out in the past by people like Dr Dmitry Momotenko, a pioneer in the field of nanopore sensing, who was also in attendance. This opportunity allowed me to grow my presentation and communication skills, and the feedback I received has motivated me to do an oral presentation at the next conference I attend.

Overall, the conference was a great success thanks to the excellent organization, scheduling, and management, as well as the enthusiastic group of electrochemists who were in attendance and ready to share their knowledge and experiences. During this conference, I had the privilege to meet and connect with many electrochemists and engage in discussions about electrochemistry as well as their experiences transitioning from post-graduate studies to post-doctoral life or working in industry. I appreciate the financial assistance that the Royal Society of Electrochemistry group will provide me to defray the costs of conference registration, travel, and accommodation. I look forward to attending the ISE Conference next year.

Figure 1. Pallavi and fellow attendees at ISE conference

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MAT-SUS

Student conference report: Materials for Sustainable Development Conference (MAT-SUS), Barcelona, Spain, 24-28 October 2022

Caiwu Liang[a]

[a]**Department of Materials, Imperial College London, London, UK**

The Materials for Sustainable Development Conference (MAT-SUS) was held from 24th to 28th October 2022 in Barcelona, Spain. This conference focus on the topic of sustainability in materials science and technology encompasses alternative energy technologies to mitigate problems with fossil-fuel technologies, and to increase energy efficiency; The Conference consists of a combination of symposia on different important energy-related areas including solar fuel, electrocatalysts, battery, where electrochemistry plays a key role.

The symposia that I was extremely interested in is Operando Characterization of Electrocatalytic Interfaces, chaired by Dr. Reshma Rao from imperial College London. Operando or in situ characterization of complex interfaces with increased spatiotemporal resolution is key to advancing knowledge-guided catalyst design or any other electrochemical process design. This symposia brings together a series of cutting-edge operando characterization techniques in to one room and shows the latest developments in operando investigation of electrocatalytic reactions, including water electrolysis, fuel cells, carbon dioxide reduction, nitrogen reduction and alcohol oxidation. The progress that the community had made in the last several years on understanding the fundamental electrochemical interface using all these amazing operando techniques had impressed me a lot.

Figure 1. Speaker highlights from the MATSUS conference

Prof. Serhiy Cherevko from Forschungszentrum Jülich showed a very unique technique-operando Inductively coupled plasma mass spectrometry (ICP-MS) that was developed by their group. This technique can be used to in-situ monitor the dissolution of metals in real time during electrochemical process in a resolution of higher than ppm level. This is extremely important for understanding the stability of catalysts and guiding us to design more stable catalysts that can run in long-term for renewable fuels generation. Prof. Yu Katayama, from Osaka University, gave another interesting talk on how to use operando Surface Enhanced Infrared Absorption Spectroscopy (SEIRA) to observe the surface adsorbed intermediates at a resolution of single layer atom on the surface. He also shared how he used this technique to understand the CO adsorption mechanism on a clean Pt surface. There are also other amazing talks on in-situ Ambient-Pressure X-ray Photoelectron Spectroscopy given by Ethan Crumlin, from Advanced Light Source, and operando TEM, given by Vasiliki Tileli from Ecole Polytechnique Federale de Lausanne. All these techniques combine to move our understanding forward on electrochemical interface at atomic level.

I also presented my research on using operando and time-resolved Uv-vis spectroscopy for understanding the kinetic on different types of iridium oxides. I showed how I quantitively measured the intrinsic activity of amorphous and crystalline iridium oxides without any assumption of surface area and therefore give insights into the origin of activity difference between amorphous and rutile iridium oxides. It was interesting to share my results with so many international experts in electrochemistry. We had a long discussion of my results during the

coffee break section, and I found it very helpful and bring me more ideas for my future research. These talks make this conference even more exciting and meaningful to me.

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Future conferences:

International Society of Electrochemistry

Below is the list of ISE conferences listed online:

2023
3-8 September, Lyon, France (74th Annual Meeting)
Bridging Scientific Disciplines to Address the World's Challenges
(**more information**)

2024
26-29 May, Sibenik, Croatia (36th ISE Topical Meeting)
Marine and Environmental Electrochemistry
(**more information**)

9-12 June, Stresa, Italy (37th ISE Topical Meeting)
Electrochemical Energy for a Greener and more Sustainable Future Society
(**more information**)

18-23 August, Montréal, Canada (75th Annual Meeting)
Electrochemistry – Science and Technology for a Sustainable and Better Planet
(**more information**)

8-11 September Manchester, UK (38th ISE Topical Meeting)
Nanomaterials in Electrochemistry
(**more information**)

2025

Natal, Brazil (39th ISE Topical Meeting)

Changchun, China (40th ISE Topical Meeting)

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

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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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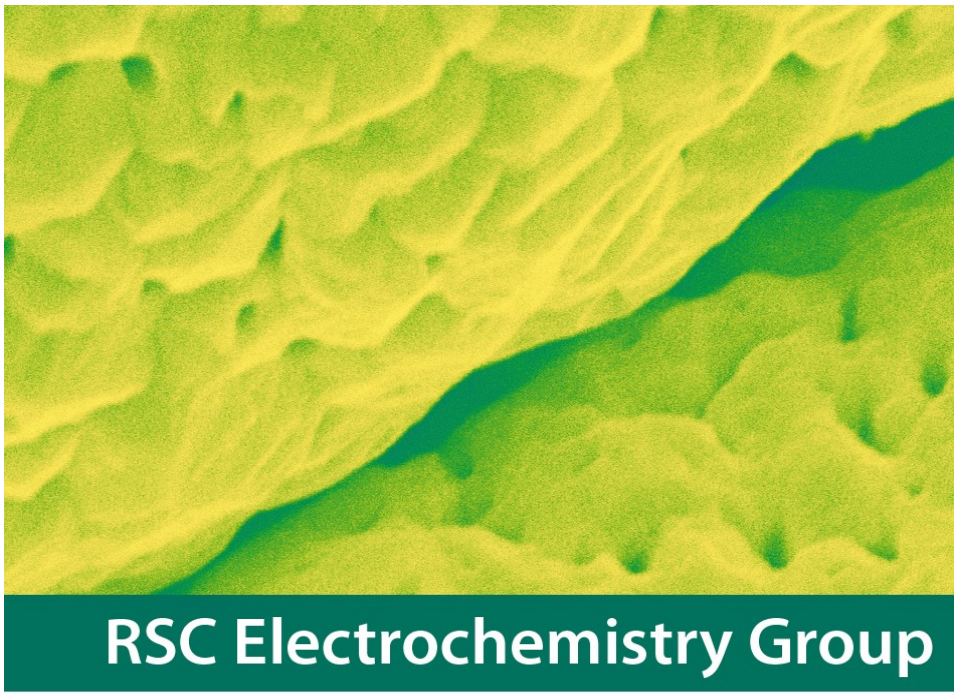

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The Electroanalytical Sensing Systems Group

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
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- ideal for sensor applications

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Electrochemistry Solutions - What's New?

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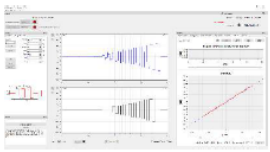
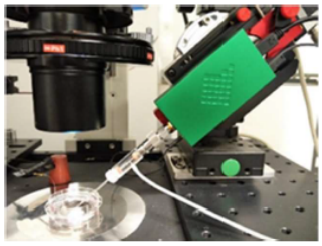
Alvatek is now the official UK distributor for Elements Srl products. Elements specialises in pico- and nano-scale electrochemistry measurements ranging from live cells to bio- and solid state nanopore sensing.





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

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

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- Are £1.5K per channel ex VAT

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New Product Information

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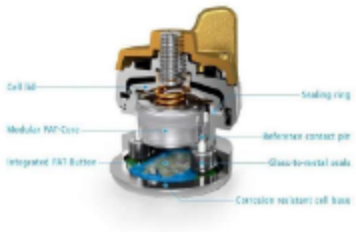
Email: info@alvatek.co.uk www.alvatek.co.uk

Energy Research Solutions - What's New?

EL-Cell – battery test cells & fixtures

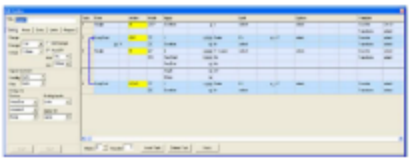
Alvatek is now the official UK exclusive distributor for El-Cell GmbH. El-Cell's unique combination of Electrochemistry and mechanical engineering expertise is evident in its innovative and high quality range of cells, systems and dilatometers for battery research.

- 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.

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- Per-channel costs start around £1K.

IviCycler

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- 10mA per channel OR
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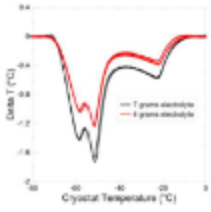

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New Product Information

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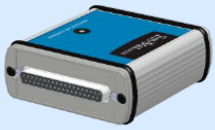
EmStat3 and 3+

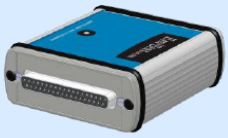
Potentiostat

EmStat3 MUX8



EmStat3 with integrated 8 channel multiplexer (MUX8)

EmStat3 MUX16



EmStat3 with integrated 16 channel multiplexer (MUX16)

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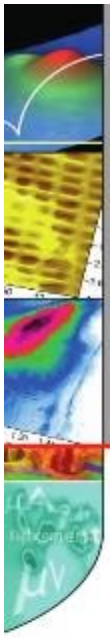
- Fuel cells/photovoltaic cells
- Fundamental electrochemistry
- Corrosion



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

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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

New Product Information

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	±4.096 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:

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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
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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 MSA data acquisition - pulse, CV	●	●	●	●		●
100 aA current resolution	●		●	●	●	●
Up to ±2A current - scan / pulse		●			●	●
±100 V compliance and polarization	●	●	●			●
10 pΩ impedance measurement		●	●			●
>100 TΩ impedance measurement	●		●	●	●	●
Multiple high-speed EIS techniques	●	●	●	●	●	●

solartron analytical

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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

bluescientific

www.blue-scientific.com

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

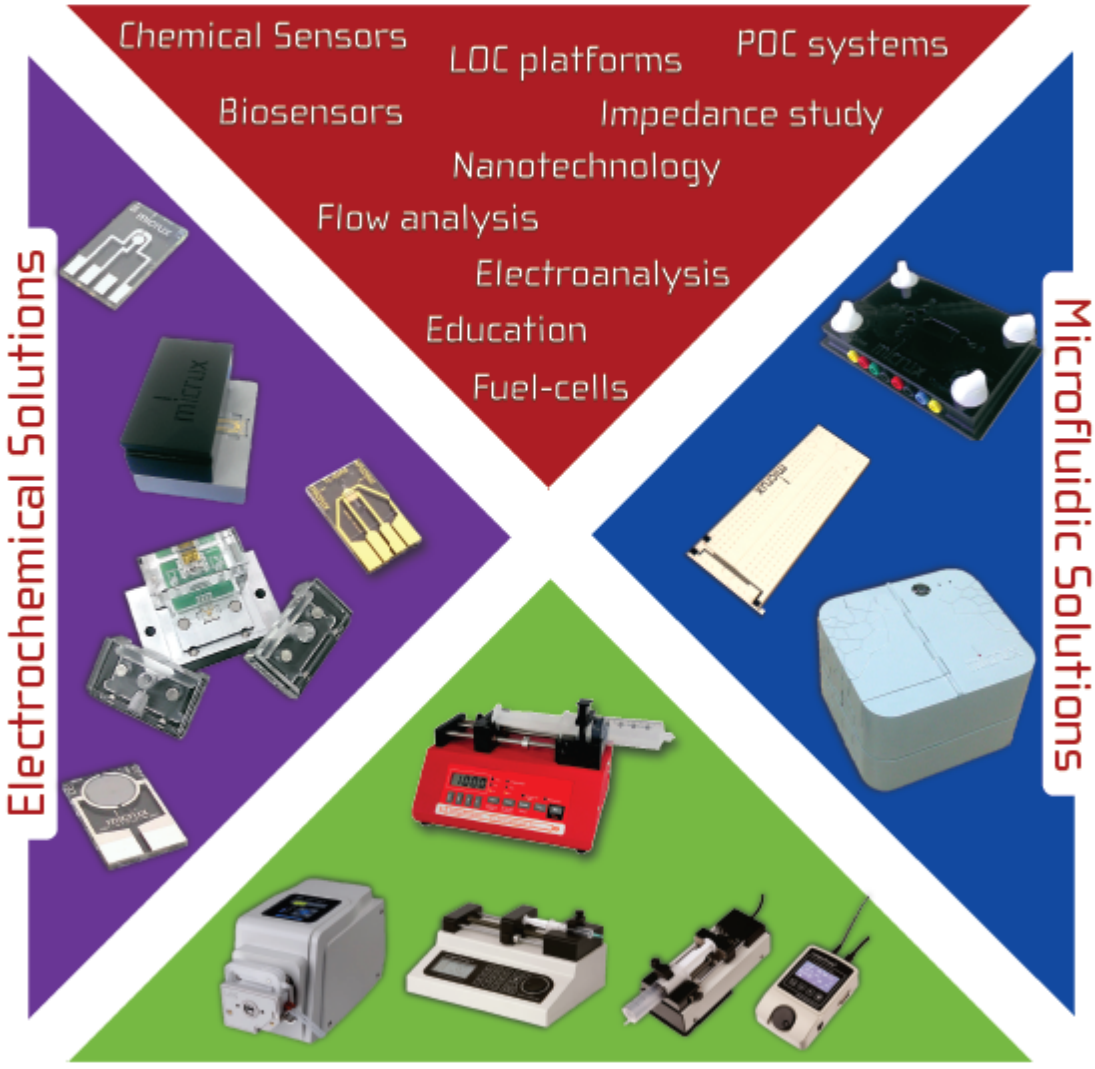
» PROFICIENCY IN MICROFLUIDICS

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.

mart Microfluidic & Electrochemical
olutions for Research Science

micrux
TECHNOLOGIES

Innovative Solutions for Multiple Applications



Accessories for Microfluidics & Electrochemistry

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