



EMCR 2022

13th International Symposium

on

Electrochemical Methods in Corrosion Research

September: 25th – 30th 2022

CAES- La Vieille Perrotine

St Pierre d'Oléron (17)- FRANCE



The first EMCR conference was held in Manchester in 1982, and it has subsequently run in Toulouse (1985), Zurich (1988), Helsinki (1991), Lisbon (1994), Trento (1997), Budapest (2000), Ysermonde (2003), Dourdan (2006), Maragoggi (2012), Troia (2015) and Cambridge (2018).

The 13th conference will be held in Oleron Island, France from September 25th to September 30th at the CAES-CNRS La vieille Perrotine.

This conference has evolved into one of the leading events in corrosion electrochemistry, providing an intimate, focused meeting. The social events and combination of accommodation and technical papers at a single site provides ample opportunity for informal interaction.

All aspects of corrosion research with an electrochemical component will be considered; topics of particular interest include:

- Scanning and microprobe techniques, including scanning probe, SECM, LEIS and techniques based on AFM technology.
- Electrochemical studies of environmentally-assisted fracture.
- Detection of hydrogen and studies of hydrogen interaction with metals.
- Electrochemical impedance spectroscopy and electrochemical noise.
- Modelling from the atom to the application.
- Combination of electrochemical studies with complementary techniques (e.g. optical, ultrasonic, radiographic, tomographic, etc...).
- Cathodic protection and inhibition.

Scientific committee of EMCR

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Philippe Refait, Xavier Feugas

Alice Martin, Romain Le barbenchon, Mohcin Serjouan,

Romane Palluet, Caroline Marais

EMCR 2022 Program: Sunday 25th September

15 :00	Registration open
18 :30	Welcome cocktail
19 :00	Diner

EMCR 2022 Program: Monday 26th September

8:15	Registration open
9:00	Conference Opening
9:15	M. Kadem, Orignalys
9:20	M. Baars, IVIUM Technologies
Corrosion Models and Mechanisms	
9:25	“Comparing Modelling and Experiments for Prediction of Atmospheric Corrosion under Controlled Dynamic Thin Film and Droplet electrolytes” Herman Terryn, Vrije Universiteit Brussel, Brussels, Belgium
9:50	“Corrosion Progress of Steels in the Freezing Condition” Azumi Kazuhisa, Hokkaido University – Japan
10:15	“Promotion effect of Al ions on hydrogen absorption into steel under wet-dry cycle corrosion” Xiaole Han, Graduate School of Engineering, Hokkaido University, Japan
10:40-11:10	Break, Refreshments
Corrosion in Energy conversion and storage	
11:10	“Insight into the protectiveness of calcium carbonate scaling on carbon steel surfaces in geothermal environment” Federico Bertin, IFP Energies nouvelles, Solaize, France
11:35	“On the electrochemical behaviour of iron in H ₃ PO ₄ /LiOH mixtures” Ramon Novoa, Universidade de Vigo, Spain
12:00	“Reuse of waste water produced from petroleum fields as a source for hydrogen energy production (electrochemical method)” Mohamed Deyab, Egyptian Petroleum Research Institute, Egypt
12:30-14:00	LUNCH
Passivity and local corrosion	
14:00	“Dielectric model of oxide layer composed of an inner and an outer layer” Bernard Tribollet, LISE UMR 8235, CNRS-Sorbonne Université, Paris, France
14:25	“Characterization of electrochemically grown passive film on 316L stainless steel. Relationships between corrosion properties and semiconductive characteristics” Oliver Thimm, ZSW Ulm, Germany
14:50	“Effect of Cl ⁻ and dissolved oxygen on passivation behavior of 304L stainless steels and high entropy alloys in acidic solution” Chenyang Xie, Institut de Recherche de Chimie Paris UMR8247 CNRS, Chimie-Paristech, PSL University, France

15:15	“Investigation of the role of hydrogen on dissolution and passivation processes of an austenitic stainless steel” Catherine Savall, LaSIE UMR 7356 CNRS - La Rochelle Université, France
15:40-16:00	Break, Refreshments
16:00	“Electrochemical characterization and corrosion behaviour of Fe-based shape memory alloys” Carmen Perez, Universidad de Vigo Spain
Corrosion in concrete	
16:25	“pH Sensor for In-situ Monitoring of Cement Paste Inside” Koji Fushimi, Faculty of Engineering, Hokkaido University, Hokkaido Japan
16:50	“Contribution of electrochemical impedance spectroscopy to the study of aluminium-magnesium alloys corrosion in magnesium potassium phosphate cement pore solution » Gabriel Poras, CEA, DES, ISEC, DE2D, SEAD, LCBC, Univ Montpellier, Marcoule, France
17:20	Posters and exhibition
19:00	Diner

EMCR 2022 Program: Tuesday 27th September

8:15	Registration opens
8:30	“Kelvin probe based methods for measuring effusion and diffusion of hydrogen from and through materials at high resolution and sensitivity” Keynote : Michael Rohwerder, Max Planck; Dusseldorf, Germany
9:20	S. Verret, HTDS
Electrochemical Methods in corrosion research	
9:25	“Development of an experimental approach to characterize the crevice corrosion behaviour of the Ni-base 825 alloy” Hugo Klinklin, INSA Lyon, MATEIS UMR5510 CNRS, Villeurbanne France
9:50	“Effect of microstructure on the electrochemical behaviour of 42CrMo4 QT steel” Francesco Andreatta: University of Udine, Italy
10:15	“Electrochemical study of the ZrNbO alloys ageing under high temperature and high pressure” Duncan Peyret, Laboratoire de Réactivité de Surface, UMR 7197, Sorbonne Université, Paris, France
10:40-11:10	Break, Refreshments
11:10	“Elementally resolved dissolution kinetics via AESEC-EIS methodology for a NiCrFeMn(Mo)Co high-entropy alloy system” Junsoo HAN, Sorbonne Université, Laboratoire Interfaces et Systèmes Electrochimiques, Paris, France

11:35	“Corrosion behavior of metals in NaCl solutions at sub-zero temperatures with electrochemically” Masatoshi Sakairi, Hokkaido University, Japan
12:00	“On the use of voltammetry around open circuit potential (VAOCP)” Philippe Refait, LaSIE, UMR 7356 CNRS, La Rochelle Université, France
12:30-14:00	LUNCH
14:00	“Impedance analyses on Mg-Zr alloy for Mg Wastes Conditioning” Eric Schmucker, CEA - Université Paris-Saclay, France
14:25	“Intergranular corrosion under diffusion control” Benoit Gwinner, Université Paris-Saclay, CEA, France
14:50	“Interpreting electrochemical impedance response of coated metals using Machine Learning” Vincenzo Bongiorno, The University of Manchester, UK
15:15	“Odd Random Phase Electrochemical Impedance Spectroscopy (ORP-EIS) as a new tool for reliable operando studies of corrosion systems” Annick Hubin, Vrije Universiteit Brussel, Belgium
15:40-16:00	Break, Refreshments
16:00	“Local combined techniques for studying pitting Corrosion” Vincent Vivier, Sorbonne Université, Paris, France
16:25	“Micro droplet Corrosion characterized by changes in wettability and surface area” Mireille Turmine, Sorbonne Université, Paris, France
17:00	Poster session / exhibition
19:00	Diner

EMCR 2022 Program: Wednesday 28th September

9:00	Registration open
9:20	“Barrier properties of organic coatings: molecular mobility analysis by electrochemical impedance and broadband dielectric spectroscopies” Keynote : Nadine Pébère, CIRIMAT, Toulouse, France
10:10	L. Akrou, Metrohm
Corrosion inhibitors	
10:15	“Corrosion behavior of 2024-T3 aluminum alloy influenced by metal cations in 10mM NaCl solutions” Li Li, Hokkaido University, Japan
10:40-11:10	Break, Refreshments
11:10	“Inhibitive effect of Ce(III) and molybdate on the corrosion resistance of Zn sacrificial coatings: effect of alloying compounds of the sacrificial layer” Marjorie Olivier, Université de Mons, Belgium
11:35	Electrochemical study of corrosion inhibitors for gray cast iron rotors in automotive braking systems Michele Motta, University of Udine – Italy
12:00-14:00	LUNCH
14:00	Complementary activities 1- Sea cruise around Fort Boyard and Ile d'Aix 2- Visit of Fort Royer & LPO Nature Reserve
19:30	Diner

EMCR 2022 Program: Thursday 29th September

8:30	Registration open
8:55	“Corrosion behavior of aluminum alloys obtained by additive manufacturing” Keynote : Marina Cabrini, University of Bergamo, Italy
9:45	J.M. Pichonat, Biologic
Local Electrochemical Techniques	
9:50	“Electrochemical monitoring of interfacial pH change during electrodeposition of chromium from trivalent chromium sulfate solution” Zahra Sharifi, Leiden Institute of Chemistry, Leiden University, Netherlands
10:15	“Imaging Hydrogen Interactions with Materials at the Nanoscale: SIMS-Based Correlative Microscopy” Santhana Eswara, Luxembourg Institute of Science and Technology Luxembourg

10:40-11:10	Break, Refreshments
11:10	“Polarisation curves for ultra-high strength steels under atmospheric corrosion conditions using Scanning Kelvin Probe” Varvara Helbert, Institut de la Corrosion, Brest, France
11:35	“Probing water uptake gradient in an epoxy matrix via scanning electrochemical microscopy SECM” Dao Trinh, LaSIE UMR 7356 CNRS, La Rochelle Université, France
12:00-14:00	LUNCH
Corrosion in Biomedical Applications	
14:00	“Scanning Droplet Cell Microscopy with Downstream Analysis for the Combinatorial Development of Permanent or Biodegradable Implants” Achim Walter Hassel, Johannes Kepler University Linz, Austria
14:25	“Corrosion behaviour of Ti6Al4V manufactured by laser powder bed fusion in simulating body fluid” Sergio Lorenzi, University of Bergamo, Italy
14:50	“A probe into the corrosion behaviour of a Mg93/Y4/Nd3 implant rod in simulated body fluid using the dynamic-EIS” Husnu Gerengi, Faculty of Engineering, Duzce University, Turkey
Coupling between electrochemical and non-electrochemical methods	
15:15	“Combination of electrochemical and acoustic emission recordings for corrosion detection on damaged painted Al alloys coupons” Justin Busnot, ICB UMR6303 CNRS, Université de Bourgogne – France
15:40-16:00	Break, Refreshments
16:00	“A study of “blush” on can coatings via correlated EIS and AFM-IR” Julie Cler, University of Manchester – United Kingdom
16:25	“In situ Imaging and Electrochemical Monitoring of Damaged Thermal Spray Aluminium Coating in Synthetic Seawater” Adriana Castro-Vargas, University of Leicester, United Kingdom
17:00	“Investigation of the influence of grinding parameters on the formed Beilby layer and the surface activity of ground aluminum surfaces” Sigrid Benfer, DECHEMA-Forschungsinstitut – Germany
17.25	“Corrosion resistance of AA2024-T3 anodized in TSA, post-treated in Ce-H2O2 solution and sealed with hybrid sol-gel coatings” Hercilio G. De Melo, Escola Politecnica da Universidade de Sao Paulo, Brazil
18:00	Poster session / exhibition
20:00	GALA Diner

EMCR 2022 Program: Friday 30th September

8:30	EMCR 14 th - selection
Coatings for corrosion protection	
9:00	“Effect of physical ageing onto water uptake and adhesion of epoxy coatings” Ismail Kada, LaSIE UMR 7356 CNRS, La Rochelle Université, France
9:25	“A comparative study of different sol-gel coatings for sealing the plasma electrolytic oxidation (PEO) layer on AA2024” Sajjad Akbarzadeh, University of Mons, Belgium
9:50	“Corrosion behavior of aluminium and magnesium alloys with inorganic-organic hybrid coatings produced by plasma electrolytic oxidation” Maciej Sowa, Silesian University of Technology – Poland
10:15-10:35	Break, Refreshments
10:35	“Zirconia sol-gel coatings for corrosion protection: extensive surface characterization for the interpretation of electrochemical results” Alexis Renaud, IRT-M2P, Duppigheim, France
11:00	“Tribological and corrosion properties of NiW alloys deposited onto low alloyed steel : Relationship between metallurgical features and functional properties” Juan Creus, LaSIE UMR 7356 CNRS, La Rochelle Université, France
12:00-14:00	LUNCH – End of the conference

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