10th International Symposium on
Electrochemical Impedance Spectroscopy

June 19 – 24, 2016

Hotel Eurostars Isla de La Toja
A Toxa – Galicia – Spain

Programme and Book of Abstracts

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PREFACE

The work by Epelboin and his group in Paris in the 1960's that developed impedance as analytical tool for elucidating corrosion mechanisms, and the apparition of automated Frequency Response Analysers in the late 1970's lead to the great development of the technique in the 1980's. The series of International Symposia on Electrochemical Impedance Spectroscopy (the term EIS was coined by F. Mansfeld in the early 1980's) initiates in Bombannes, France, in **1989**, organised by Claude Gabrielli.

An important feature of these meetings is that all participants stay together at the meeting venue for the entire duration of the event, allowing for fruitful discussions that bring new insights on the latest developments of the technique with the leading scientist in the field. This ambience is further promoted by sharing social activities including all the meals, excursions, gala dinner and other social events that stimulate a sense of group in the scientific community.

The particular philosophy of the EIS symposia has led to further successful meetings organised by:

Digby Macdonald at Santa Barbara, CA, USA (**1992**),
Jean Vereecken at Ysermonde, Belgium (**1995**),
Oscar Rosa Mattos at Angra do Reis, Brazil (**1998**),
Pier Luigi Bonora at Marilleva, Italy (**2001**),
Mark E. Orazem at Cocoa Beach, FL, USA (**2004**),
Nadine Pébère at Argeles-sur-Mer, France (**2007**),
João S. Fernandes and M. Fátima Montemor at Carvoeiro, Portugal (**2010**), and
Masayuki Itagaki at Okinawa, Japan (**2013**).

Because of that history and specific format, the International Symposia on Electrochemical Impedance Spectroscopy have certainly become the most important events on the subject of EIS.

The present 10th EIS conference is being held at A Toxa (Galicia, Spain) and the Organizing Committee wishes to continue the successful tradition of the previous symposia. EIS 2016 intends to bring together the experts on the most recent advances and applications of Electrochemical Impedance Spectroscopy in the fields of Corrosion (kinetics, protection by coatings, passivation), Energy (conversion and storage), Mechanisms and Modelling, Biomedical and Biological Systems (including sensors), Localised Measurements and Data Processing.

We wish to express our gratitude to all the members of the Organizing Committee and to the ENCOMAT group members to allow this conference to continue the EIS tradition. We also thank the members of the International Scientific Committee for giving us the opportunity to organize in 2016 the 10th EIS conference in the lovely west coast of Spain, Galicia.

Furthermore, we welcome all of you to A Toxa and wish you a fruitful stay, building new personal and professional relationships.

X.R. Nóvoa C. Pérez

EIS2016

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Program

Program Lectures

EIS2016

	Sunday June 19	Monday June 20	Tuesday June 21		Wednesday June 22		Thursday June 23	Friday June 24
8:45-9:00		Welcome	**Hall A**					
9:00-10:00		PL1 (J. Bisquert)	PL2 (C. Brett)		PL3 (D.D. Macdonald)		PL4 (V. Vivier)	PL5 (M. Musiani)
		Room A	**Room A**	**Room B**	**Room A**	**Room B**	**Room A**	**Room A**
10:00-10:30		1330 (A. Hubin), **KN**	0090 (S. Touzain), **KN**	0470 (M. Rueda), **KN**	1150 (I. Aoki), **KN**	1470 (J.S. Fernandes), **KN**	0740 (J.J. Gª-Jarreño), **KN**	0810 (S. Ceré), **KN**
10:30-10:50		0330 (J. Schefold)	0020 (H. Costenaro)	0190 (F. Hilario)	1340 (V. Shkirskiy)	0670 (J. Zhang)	0570 (F. La Mantia)	0380 (L. Hernández-Alv)
10:50-11:10		0460 (M. Castellino)	0060 (C. Vosgien)	0290 (V. Lazarescu)	1350 (P. Volovitch)	0980 (J. Agrisuelas)	0280 (J. Song)	1090 (M. Carradot)
11:10-11:30		0930 (A. Sorreno)	0170 (M. Aparicio)	---	0550 (A. Khanghol)	0210 (D. Koster)	0990 (A. Thompson)	0480 (C. Lilja)
11:30-12:00		Coffee break	Coffee break		Coffee break		Coffee break	Coffee break
12:00-12:30		0320 (M. Itagaki), **KN**	0540 (D. Vladkova), **KN**	0620 (M. del Valle), **KN**	0660 (V. Egorkin), **KN**	0630 (D. Harrington), **KN**	1410 (A.W. Hassel), **KN**	1080 (H. G. de Melo), **KN**
12:30-12:50		1100 (T.P. Heins)	1120 (A. Giuliano)	0350 (L. M. Bravo-An.)	0450 (T.T. Thai)	1190 (R. Antaño-Lóp.)	1050 (B. Ter-Ovanes.)	1060 (S. Lorenzi)
12:50-13:10		0830 (M. Heinrich)	0650 (L Fdez-Macia)	0080 (T. Barrès)	0750 (K. Cysewska)	0120 (J.J. Giner-Sanz)	0790 (A. Baars)	1400 (A. Castela)
13:10-13:30		0720 (G. G. Lang)	0370 (V. Subotic)	---	0900 (A. Bastos)	0360 (T. Holm)	1070 (D.S. Ramirez-Rico)	1290 (I. Sánchez)
13:30-15:00		Lunch	Lunch		Lunch		Lunch	**Closure** Lunch
15:00-15:30		0010 (N. Wagner), **KN**	0420 (N. Pébère), **KN**	0730 (H. Nara), **KN**			0500 (F. Deflorian), **KN**	
15:30-15:50		0310 (C.-A. Schiller)	0220 (A. Nicolay)	0940 (S. Marcelin)			0300 (B. Díaz)	**KN**: Key Note Lecture
15:50-16:10		0960 (M. Kuttinger)	0390 (A. Renaud)	0430 (A. Sacco)			0440 (E. Huttunen-Saar.)	
16:10-16:30		0890 (A. Battistel)	0410 (A. T. Trinh)	0580 (H.S. Park)			0700 (Y. Hoshi)	
16:30-17:10		coffee break & poster session	coffee break & poster session		Tour		coffee break & poster session	
17:10-17:40		1280 (M.F. Montemor), **KN**					0600 (B. Tribollet), **KN**	
17:40-18:00	Registration	0760 (E.M. Tresso)					0140 (S. Capelo)	
18:00-18:20		0180 (K. Grigoras)	Boat tour (to be confirmed)				0100 (A. Doménech-Carb.)	
18:20-18:40		0970 (R. Gonçalves)					0110 (M. Benoit)	
19:00-21:00	EIS Course							
21:00-23:30	Welcome dinner	Dinner	Dinner		Dinner		Congress Dinner	

List of Poster Presentations (Posters should be available for discussion from Monday to Thursday)

Energy

013P (E. M. Ortega)
040P (Y. Irokawa)
051P (A. Giuliano)
052P (A. Giuliano)
059P (J.H. Hang)
064P (H. Kato)
065P (Y. Gamano)
087P (M. Serrapede)
088P (P. Rivolo)
123P (N. Harms)
136P (T.M. Silva)
138P (H. Fukunaga)

Sensors

137P (C. Brett)

Theory/Experimental techniques

025P (A. Moya)
034P (C.A. Schiller)
101P (D.A. Harrington)
111P (C. Álvarez-casillas)
113P (A. Battistel)
114P (T. Holm)
118P (A. Rodríguez)
124P (V. Vivier)
125P (M. Keddam)
126P (M. Keddam)
144P (G. Mészáros)

Corrosion and Protection

004P (I. Preker)
016P (M. Aparicio)
023P (F.J. Rodríguez-Gómez)
049P (D. Álvarez)
056P (H. G. de Melo)
069P (V. S. Egorkin)
082P (M. Terada)
084P (K. Raheem)
092P (A.M. Santos)
095P (C. Molena de Assis)
100P (V. Figà)
102P (A. Gómez-Sánchez)
116P (I. V. Aoki)
117P (E. Bravo)
120P (K. Miranda)
122P (C.M. Abreu)
127P (M.C. Pérez)
130P (A.S. Castela)
131P ((J.D. Santos)
132P (R.G. Duarte)
142P (C. Alvarado)
143P (M. Sancy)
145P (A. Maltseva)
148P (N. Wagner)
149P (B. Puga)
150P (L. Vivar Mora)

Electrochemical Study on the Stability of the Nickel Passivation layer Influenced by Halide Anions

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Nickel is a material that exhibit good resistance to oxidation compared with metals such as iron, cobalt, and cooper, particularly, whenever exposed to corrosive atmosphere and aqueous aggressive environments. This good performance is attributed to the capacity of nickel to promote the formation of stable layer of oxides and hydroxides products on its surface [1, 2, 3].
Passive films on metals and alloys surfaces can effectively isolate the substrate from the corrosive environment and provide the surface property of self-protection against corrosion. However, the level of protection given by passivation is strongly related with the crystallinity and nature of defects of passive films [4].
The aim of this work was to study the effect of F^-, Cl^-, Br^- and I^- anions on the breakdown of the passive film layer in nickel substrate by Electrochemical Impedance Spectroscopy (EIS).
The results observed showed that hydrated chloride ions destabilize the passive layer. These facts suggest that the passive films protectiveness is affected accordingly with the level of interactions between halide anions and metal ions. Probably their adsorption on the oxide layer affects the growth, resistance and stability of nickel oxide film [5].

Keywords: nickel, passive layer, halide anions, electrochemical techniques.

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[4] P. Marcus, Electrochimica Acta, 43 (1998) 109-118.
[5] R. S. Schrebler Guzmán, J. R. Vilche and A. J. Arvía, Corrosion Science, 18 (1978) 765-779.