



GEI 2018

PROGRAM &
BOOK OF
ABSTRACTS

GIORNATE

DELL'ELETTROCHIMICA

ITALIANA



1st winter edition

JANUARY 21-25
2018

OLYMPIC VILLAGE HOTEL, SESTRIERE (TO) – ITALY



PROGRAM

Sunday, January 21st

14:00

Registration

15:45

Welcome and Opening of the winter GEI 2018

AFTERNOON Session – Chairmen: ARBIZZANI C. / PENAZZI N.

16:00 Su.I01

VERLATO

Study of CO₂ reduction over nanostructured catalysts: effect of ceria as co-catalyst

16:20 Su.Or01

SAVINO

The role of oxygen vacancies in green-synthesized TiO₂ for CO₂ photoelectroreduction

16:40 Su.Or02

FALCIOLA

Preparation and electrochemical characterization of “insulating” or mesoporous solid-templated silica films

17:00 Su.Or03

NERVI

Electrochemical reduction of CO₂ by electrodes functionalized with transition metal complexes

17:20 Su.KN01

GENNARO

From fundamental research to industrial applications: the case of electrochemistry for ATRP

18:00 Su-LM

TARASCON

Award of the Galvani Medal (Introduction by F. PAOLUCCI)

Energy storage via batteries: a dual materials-electrochemistry approach

19:30

Welcome party

Monday, January 22nd

ENERCHEM joint session 1 – Chairmen: NAVARRA M. / NERVI C.

08:40	Mo.PL01	FREITAG	Copper complexes for dye-sensitized solar cells
09:15	Mo.I02	BINETTI	<i>The current status and future prospects of chalcogenide thin film solar cells</i>
09:35	Mo.Or04	LONGONI	A novel wet jet milling-exfoliated WS ₂ -graphite dual-ion battery: from lab-to-industrial scale feasibility
09:55	Mo.Or05	PAVONE	Dye-electrode interface in p-type photo-electrochemical cells: new insights from ab initio calculations
10:15	Mo.Or06	DI NOTO	New ion-exchange membranes derived from polyketone
10:35	Coffee break		

ENERCHEM joint session 2 – Chairmen: BINETTI S. / BAROLO C.

11:00	Mo.I03	BRUNETTI	<i>Scaling up of organic and perovskite solar cells: an overview on lights and shadows</i>
11:20	Mo.Or07	NAVARRA	A systematic approach to design novel ionic liquids as electrolyte components in lithium batteries
11:40	Mo.Or08	SCALIA	Photo-capacitors: dye sensitized PV technology and carbon-based electrical double layer capacitors integration
12:00	Mo.Or09	MATTAROZZI	Electrodeposition of porous Cu-Zn alloys showing remarkable low T performances in Li-ion batteries
12:20	Mo.Or10	ARAB	Photoactive TiO ₂ films by plasma electrolytic oxidation
12:40	Lunch break & Relax		

AFTERNOON Session 1 – Chairmen: RAPINO S. / KANOUI F.

14:35	Mo.KN02	PALCHETTI	Nanostructured electrochemical biosensing platforms for nucleic acid determination
15:00	Mo.I04	BESTETTI	<i>Entropy production rate as a tool for calculating corrosion current density</i>
15:20	Mo.Or11	PIFFERI	A concerted investigation of the interlayer charge transfer in silver/anatase nanocomposites
15:40	Mo.Or12	BARTOLINI	Exploring cellular interactions with 2D organic monolayers by scanning electrochemical microscopy
16:00	Mo.Or13	CINTI	Paper-based electrochemical tools for sweat analysis
16:20	Coffee break		

AFTERNOON Session 2 – Chairmen: PIFFERI V. / GALLIANO S.

16:50	Mo.I05	BARBUCCI	<i>Impedance study of perovskite materials for IT-SOFCs: case of La_{0.8}Sr_{0.2}MnO_{3-δ}, La_{0.8}Sr_{0.2}Co_{0.2}Fe_{0.8}O_{3-δ} and Ba_{0.5}Sr_{0.5}Co_{0.8}Fe_{0.2}O_{3-δ}</i>
17:10	Mo.Or14	VICARI	Electrochemical treatment of real wastewater with low conductivity
17:30	Mo.Or15	ARMANDI	Effect of iron addition on the catalytic activity of manganese oxides electrodeposited films in the water oxidation reaction
17:50	Mo.Or16	DURANTE	Effect of thiophenic-like functional group on Pt NPs deposition and activity towards oxygen reduction reaction
18:10	SPONSOR TALKS (Biologic, Elsevier, Lithops)		
19:30	Dinner		
21:30	POSTER SESSION 1 – All Posters are exposed		

Tuesday, January 23rd

MORNING session 1 – Chairmen: PALCHETTI I. / ISSE A.

08:40	Tu.PL02	BANKS	Electrochemical sensors: from screen-printed electrodes to graphene
09:15	Tu.I06	VALENTI	Transparent carbon nanotube network for efficient electrochemiluminescence imaging
09:35	Tu.Or17	ANTONELLO	Ordering gold nanoclusters by electrochemistry
09:55	Tu.Or18	MIOMANDRE	Electrochemical modulation of the fluorescence of tetrazines: from solution to monolayers
10:15	Tu.Or19	TESTOLIN	Functional hybrids of multilayer CVD graphene and colloidal anatase nanocrystals
10:35	Coffee break		

MORNING session 2 – Chairmen: ANTONELLO S. / PIANA G.

11:00	Tu.I07	NEGRO	Hierarchical “core-shell” electrocatalysts for the oxygen reduction reaction (ORR) based on graphene “cores” and metal alloy carbon nitride “shells”
11:20	Tu.Or20	DANIEL	PGM free electrocatalyst based on Fe-N _x active sites embedded in mesoporous carbon for ORR
11:40	Tu.Or21	ZAFFORA	Electrochemical doping of mixed Nb-Ta oxides by the incorporation of electrolyte species
12:00	Tu.Or22	ISSE	Dissociative electron transfer to chain transfer agents for RAFT polymerizations
12:20	Tu.Or23	MINGUZZI	Recent advance in operando X-ray absorption spectroscopy on (photo)electrode materials
12:40	Lunch break & Relax		

AFTERNOON Session 1 – Chairmen: MUNOZ-GARCIA A. / BANKS C.

14:35	Tu.KN03	PIANA	Transition-metal migration upon cycling in a Li-rich layered oxide - A long-duration synchrotron in situ study
15:00	Tu.I08	BRUTTI	Gas release mitigation in Li-ion pouch cells
15:20	Tu.Or24	DE GIORGIO	Sodium-alginate: an effective binder to develop eco-friendly and water-processable Li ₄ Ti ₅ O ₁₂ /LiNi _{0.5} Mn _{1.5} O ₄ batteries
15:40	Tu.Or25	SILVESTRI	New insights on the NaAlH ₄ based anodes inefficiency in lithium cell
16:00	Tu.Or26	ZOLIN	An innovative process for Li-ion battery ultra-thick electrodes manufacturing
16:20	Coffee break		

AFTERNOON Session 2 – Chairmen: AMBROSIO E.P. - PIANA M.

16:50	Tu.I09	MUNOZ-GARCIA	First-principles design of mixed proton-electron conductors for solid-oxide fuel cell electrodes
17:10	Tu.Or27	BAGLIO	Bifunctional oxygen electrodes based on non noble metal oxides for metal-air batteries
17:30	Tu.Or28	MUSIANI	New routes to porous oxide layers
17:50	Tu.Or29	DE BON	Catalytic halogen exchange in electrochemically mediated ATRP: the case of methyl methacrylate
18:10	POSTER SESSION 2 – All Posters are exposed		
20:00	Dinner		

Wednesday, January 24th

MORNING session 1 – Chairmen: NICOTERA I. / NAIR J.R.

08:40	We.PL03	DOMINKO	Metal sulphur batteries: myth or reality?
09:15	We.I10	QUARTARONE	<i>Aqueous process of Na_{0.44}MnO₂ cathode material for the development of greener Na-ion batteries</i>
09:35	We.Or30	ARBIZZANI	Modified carbon paper interlayers in Li/S and Li/polysulfides batteries
09:55	We.Or31	FIORE	Improving the electrochemical behavior of highly abundant, low cost Fe(II) oxide as anode material in Na-ion rechargeable batteries
10:15	We.Or32	MORENO	Dissolved polysulfides as catholyte for high performance lithium-sulfur storage system
10:35	We.Or33	CHEN	Mixed colloidal/solid-state synthesis of crystalline pure P2-Na _{1.7} Ni _{1.0} Mn _{2.9} O _{7.6} and its utilization as a stable cathode in Na-ion batteries

10:55 **Light Lunch**

MORNING session 2 – Chairmen: DOMINKO R. / FREITAG M.

11:30	We.I11	NAIR	<i>Polymer electrolyte: searching for new dimensions and pathways</i>
11:50	We.Or34	NICOTERA	Single lithium-ion conducting solid polymer electrolytes based on Nafion and functionalized graphene oxide
12:10	We.Or35	TSURUMAKI	Ionic liquids as additive salts for electrolytes of lithium ion batteries with the intent of improved stability

FREE AFTERNOON / SOCIAL EVENTS

12:30
SKI Time
or TOUR of the FENESTRELLE FORTRESS

18:10 *“Updates on the organization of the ISE Annual Meeting 2018”*
M. MUSIANI Lecturer

20:00
Social Dinner, Restaurant "Al Mulino" Plan Pragelato (TO)
BEST POSTER AWARDS & SPONSOR LOTTERY

Thursday, January 25th

MORNING session 1 – Chairmen: DELUCCHI M. / DURANTE C.

08:55	Th.PL04	KANOUI	Coupling electrochemistry and high resolution optical microscopies for single nanoparticle electrochemical study
09:30	Th.KN04	RICCI	Controlling DNA-based reactions and nanostructures assembly through electronic inputs
09:55	Th.I12	ARNABOLDI	<i>Enantioselective voltammetry on achiral electrodes</i>
10:15	Th.Or36	POLO	Enzyme-based electrochemical biosensor for therapeutic drug monitoring of anticancer drug CPT-11
10:35	Th.Or37	MALFERRARI	Production of reactive oxygen species in cellular models of a human multisystem disorder monitored with modified microelectrodes
10:55	Coffee break		

MORNING session 2 – Chairmen: ARNABOLDI S. / RICCI F.

11:20	Tu.I13	DI FRANCO	<i>Assessment of corrosion resistance of austenitic and duplex stainless steels in food industry</i>
11:40	Tu.Or38	DELUCCHI	Ag as brazing metal in Ti6Al4V/Ag/YAG joints: galvanic effects in seawater
12:00	Tu.Or39	PETRUCCI	How anodization conditions affect the characteristics of thin film electrodes deposited on nanostructured titanium substrates
12:20	Tu.Or40	BRANDIELE	Effect of Y salt precursor on the synthesis and activity of PtXY alloyed NPs versus oxygen reduction reaction
12:40	Tu.Or41	ZENG	Electroreduction of CO ₂ on tin oxide modified copper oxide nanostructured foam
13:00	Closing Remarks & Departures		

Mo.Or14

Electrochemical treatment of real wastewater with low conductivity

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In the last years, many efforts have been devoted to the development of electrochemical processes for the effective treatment of wastewater contaminated by organic pollutants resistant to conventional biological processes and/or toxic for microorganisms [1–5]. It was shown that some electrochemical approaches, including the direct anodic oxidation at suitable anodes such as boron-doped diamond (BDD) and/or electro-Fenton (EF) at suitable operating conditions and cells [1–6] could allow treating effectively a very large number of organic pollutants. However, most of the investigations were performed using synthetic wastewater. Hence, it is now mandatory to study the problems connected to the passage from synthetic wastewater to the real ones.

The treatment of a real wastewater characterized by low conductivity was here performed by anodic oxidation at boron-doped diamond (BDD) in both conventional and microfluidic cells. The electrolyses carried out in conventional cells without supporting electrolyte were characterized by very high TOC removals but excessively high energetic consumptions and operating costs. The addition of sodium sulphate, as supporting electrolyte, allowed to strongly reduce the cell potentials and consequently the energetic consumptions and the operating costs. The best results in terms of both TOC removal, energetic consumptions and operating costs were obtained using a cell with a very low inter-electrode distance with no addition of a supporting electrolyte.

- [1] C. A. Martínez-Huitle, M. A. Rodrigo, I. Sirés, and O. Scialdone, *Chem. Rev.* **115** (2015) 13362-13407.
- [2] M. Panizza and G. Cerisola, *Chem. Rev.* **109** (2009) 6541-6569.
- [3] I. Sirés, E. Brillas, M. A. Oturan, M. A. Rodrigo, and M. Panizza, *Environ. Sci. Pollut. Res.* **21** (2014) 8336-8367.
- [4] C. A. Martínez-Huitle and S. Ferro, *Chem. Soc. Rev.* **35** (2006) 1324-1340.
- [5] Á. Anglada, A. Urtiaga, and I. Ortiz, *J. Chem. Technol. Biotechnol.* **84** (2009) 1747-1755.
- [6] B. P. P. Chaplin, *Environ. Sci. Process. Impacts.* **16** (2014) 1182-1203.