ELECTROCHEMICAL CONVERSION OF RENEWABLE ELECTRICITY INTO FUELS AND CHEMICALS

No. 2

A new Marie Sklodowska Curie Innovative Training Network (ITN) - **ELCoREL** – has been funded by the European Commission recently. Its goal is to train the new generation of experts capable to develop and implement novel technologies capable of storage of renewable electricity into fuels and chemicals.

The mission of ELCOREL is to train young researchers in all scientific and technological aspects of the storage of renewable electricity into fuels and chemicals. To meet this goal the ELCoREL consortium members will open 14 Early Stage Researcher (ESR) positions to support the scientific activities aiming at development of systematic knowledge supporting development of novel tailored catalysts meeting specific activity and selectivity targets for oxygen evolution and CO_2 reduction. The involvement of two industrial partners ensures rapid application of the fundamental science in electrochemical technology.



FOCUS

... Report ELCOREL meeting - Leiden January 2018

On January 22nd to 26th the first meeting involving the early stage researchers of the ELCOREL project took place in Oud Poelgeest castle, close to the lovely city of Leiden in the Netherlands.

During the first two days, many speakers took part in the workshop that was open to the public. Despite the curse that apparently targeted the speakers themselves (some fell ill, some had accidents on their way to the workshop), those who were brave enough to talk really contributed to the growth and knowledge of everyone in the audience on topics related to electrochemistry and electrocatalysis. The absence of one of the speakers even gave the opportunity to set up a last minute Q&A session with the various professors during which several interesting discussions arose.

Obviously, bringing together partners from academia and industry sparked the usual conversations on practicality versus expansion of the knowledge. Many points of view were confronted and gave rise to the sort of discussion every young scientist should assist to, to keep being curious without losing sight of the practical problems of today's society.

The third day some of the ESRs joined professor Marc Koper on a bike ride to the seaside in Katwijk, nice break from the knowledge overload biking around the very peculiar landscape with sand dunes close to the sea. The afternoon was dedicated to the museum of science and after that.. team building activity! Everyone was pretty surprised to find themselves cooking their own dinner in the kitchen of an Italian restaurant in Leiden, fun was had, also wine, and the outcome was pretty delicious.

The last two days were dedicated to the ELCOREL meeting during which all of the ESRs presented themselves and the work they intend to do during their PhD. Oxygen evolution reaction and CO_2 reduction reaction were seen under different aspects going from the theoretical modeling, to the experimental studies to the industrial application, giving a pretty complete picture of the process from ideas to the first applications.

In the end, it was a demanding experience, both physically and mentally, but it really helped creating an atmosphere of friendship and sharing of ideas among all of us young scientist that are about to start winding on down this road.

Text by Davide Pavesi (ESR fellow at Avantium)photo by Noor Hossain (Aalto University)





This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Sklodowska-Curie grant agreement No 722614.

ELCOREL Newsletter No. 2 page 1

WE INTRODUCE...

Rebecca Katharina Pittkowski

is a PhD student within the ELCOREL project in the Electrocatalysis group of Dr. Petr Krtil at J. Heyrovsky Institute Prague. Before joining ELCOREL she studied Chemistry at Technische Universität Dresden, Germany, and received her Master's Degree in 2017.

Her studies of rational design of oxide catalysts for oxygen evolution reaction (OER) within the ELCOREL project focuses on synthesis and characterization of new catalyst materials.

Rebecca, would you like to tell something about the university in Dresden or your Master thesis?

I studied Chemistry at the Technische Universität Dresden, where my master thesis was on the synthesis and characterization of new materials for the emission layer of blue phosphorescent organic LEDs (PhOLEDs). I was working in organic and metal organic synthesis, which was combined with characterization of the photophysical properties with phosphorescence spectroscopy. For a better insight into the phosphorescence characteristics, the geometry as well as the electronic structure of the compounds as well as their electronic structure was examined using DFT calculations.

What are you "doing" (scientific work) at the moment?

At the Heyrovsky Institute of Physical Chemistry, I am now working on metal oxide catalysts for oxygen evolution reaction (OER). The OER imposes an obstacle for making the electrolysis of water economically feasible, so improving the efficiency of this half-cell reaction is important on the way to using hydrogen as an alternative fuel. So far, I have mostly been focusing on synthesizing new catalysts and electrochemically measuring their catalytic activity. For a better understanding of the local structure of those newly synthesized materials, I now had the chance to go to the Swiss Light Source (SLS) at the Swiss Paul-Scherrer-Institute for X-ray absorption spectroscopy (XAS), a technique that requires synchrotron radiation. A better understanding of the structure from XAS should in return, in combination with DFT calculations from the theoreticians in Copenhagen, give a more profound understanding of how the local structure influences the catalyst's activity.

How was your experience from the actual business trip to Switzerland (synchrotron)?

The trip to the SLS synchrotron has been a very exciting new experience, as for me it was the first time to get an insight to such a big radiation source. It was very interesting to see how the experiments at the beamline are performed and I learned a lot on how to operate with this technique. As the beamtime at a synchrotron beamtime is not so easily accessible and a lot of measurements must be carried out in a short time, it showed me how many unexpected problems can be encountered, and – even more so - how much time and effort are put in to resolving those problem to be able to acquire the desired results, even at 3 am in the night.

How is life in Prague?

After moving to the city in November, it really is a revelation how beautiful Prague is in spring – there are so many parks and gardens, and everything is in bloom!



What are your hobbies and interests?

As a balance to working in the lab and office, I like to go dancing – I take flamenco classes and just recently began a ballet course for beginners here in Prague.

What is your favorite color? Blue

What is your favorite meal?

A well-prepared dinner in good company.

What is your favorite drink?

Juice spritzer ("Saftschorle", very German I suppose), cappuccino in the sun and a glass of wine with friends.

What is your favorite city / destination / country? The seaside, regardless of the weather!

Anything else you would like to tell us?

I am grateful that I was given the opportunity to become part of this multinational European project. Aside from the highly interesting research topic, I enjoy the cultural exchange, the travel, and the community of all the PhD students within ELCOREL. And I am very much looking forward to seeing everyone again at the Summer School in Copenhagen.

Thank you and good luck!

(ks)



This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Sklodowska-Curie grant agreement No 722614.

ELCOREL Newsletter No. 2 page 2

Join us for the next workshop! ...open for public!







"Summer School on Computational Chemistry in Electrochemistry and Catalysis"

workshop in Copenhagen 24–26 September 2018

with speakers: Jens Nørskov, Hannes Jonson, Ifan Stephens, Karsten Jacobsen, Anders Helman, Jan Rossmeisl, Gemma Solomon, Charlotte Rossmeisl

FOR REGISTRATION FOLLOW THE LINK http://www.conferencemanager.dk/elcorel2018



Bautahoj conference venue -> http://www.bautahoj.dk/en



....FURTHER TRAINING EVENTS

- Summer School on Computational Chemistry in Electrochemistry and Catalysis (University Copenhagen)
- Summer School of Surface Electrochemistry and Spectroscopy (Heyrovsky Institute of Physical Chemistry)
- High Performance Computing (Institute of Chemical Research of Catalonia - ICIQ)
- Material Aspects of Contemporary (Electro-Catalysis (DeNora Industries)
- Summer School on Electrochemical Engineering and Catalysis-related Energy Applications (Aalto University)
- Industrial (Electro-) Catalysis (Avantium Chemicals)

Preliminary program

Monday 24th September 2018

Jens Nørskov (Catalysis) Hannes Jonson (Transition State theory) Hannes Jonson (TS search methods) Ifan Stephens (Collaborating with theorists)

Tuesday 25th September 2018

Karsten Jacobsen (Machine learning and BEEF) Anders Helman (Simulations of oxides) Jan Rossmeisl (Simulations of electrocatalysis)

Wednesday 26th September 2018

Gemma Solomon (How to get your papers published) Charlotte Rossmeisl (Leading smart people)

SCIENCE ON/OF SOCIAL MEDIA...

...get connected with us and our members, visit our website, find interesting information, contribute the research, enjoy the science, enjoy life...



https://www.facebook.com/elcorel/ https://twitter.com/elcorelprague



www.elcorel.org

Editor: Prof. Marc T. M. Koper, Leiden University

Contact: elcorel@jh-inst.cas.cz



This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Sklodowska-Curie grant agreement No 722614.

ELCOREL Newsletter No. 2 page 3

...teambuilding for young scientists ...cooking Italian food (Leiden 01/2018)



Like





Follo

Share