

Zinc based batteries

Early Stage Researchers Seminar



Program and practical information

WBZU, Helmholtzstraße 6, Ulm, June 23rd 2017

It is our great pleasure to welcome you Ulm and the Early Stage Researcher Seminar! The seminar is arranged by the European ZAS (Zinc-air secondary batteries based on innovative nanotechnology for efficient energy storage, reference no. 646186) project.

For one day, you will join the European zinc-air battery community for updates on exciting scientific, technological and industrial developments. We are proud to present a scientifically strong program covering cathode, anode, electrolyte and cell design. The full program, alongside practical information about your participation in the seminar and the stay in Ulm, is found on the following pages. We hope you take this unique opportunity to engage in discussions of critical issues for the development of zinc-air secondary battery solutions, to interact with other students from research, and to become better acquainted with your colleagues over a cup of coffee or lunch, in beautiful surroundings in Ulm.

We wish you a successful seminar!

Best regards,
Mari Juel
ZAS project coordinator

Project: ZAS- Zinc-Air Secondary batteries
based on innovative nanotechnology for efficient energy storage



Program

June 22nd

19.00 Reception dinner at Gerberhaus (<http://www.gerberhaus-ulm.de/>)

June 23rd

09.00-09.15 Registration

Opening session:

Chair: Arnulf Latz, HIU/DLR

09.15-09.30 Mari Juel, SINTEF, "Welcome, short presentation of ZAS project"

09.30-10.00 Marcel Meeus, Susteco, "Battery Markets and Technologies"
(Keynote)

10.00-10.30 Jürgen Garche, ZSW Ulm/TU Clausthal, "Rechargeable Zinc-Air Batteries - General Overview and Report about the German Zinc-Air Project LUZI" **(Keynote)**

10.30-10.45 Coffee break

Cathode development

Chair: Luis Colmenares, CIDETEC

10.45-11.00 Michael F. Fink, ZET, University of Bayreuth, "Development of a composite catalyst comprising manganese oxide and cobalt oxide for electrically rechargeable zinc-air batteries"

11.00-11.15 Alexander Kube, DLR, "Influence of electrolyte penetration depth and how it affects the electrochemical performance of cathodes in Zn-air batteries"

11.15-11.30 Vladimir Tripkovic, DTU Energy, "Understanding and Tailoring the Performance of Transition Metal Oxides for the Oxygen Evolution and Reduction Reaction"

11.30-12.15 **Poster Session**

12.15-13.00 Lunch

Anode and Electrolyte development

Chair: Birger Horstmann, HIU/DLR

13.00-13.30 Camilla Evangelisti, ZSW Ulm, "Development challenges of Zn electrode" **(Keynote)**

13.30-13.45 Tobias Michlik, ZET, University of Bayreuth, "Coating of zinc particles with Li₂O-based functional glasses as anode material for rechargeable zinc-air batteries"

13.45-14.00 Thea Heinemeyer, Leibniz Universität Hannover, "Enhanced Zinc-Slurries for application in zinc-air batteries"

14.00-14.15 Aroa Ramos, CIDETEC, "Impact of the electrolyte system on secondary Zinc-air battery performance"

- 14.15-14.30 Steffen Merz, IEK-9, Forschungszentrum Jülich, *"PGSTE-NMR for Characterizing Ionic Liquid Electrolyte Dynamics in Gas Diffusion Electrode Frameworks"*
- 14.30-14.45 Susanne Schulze, MEET, University of Münster, *"Ionic liquid/water mixtures as a potential pathway towards secondary zinc-air batteries"*
- 14.45-15.00 *Coffee break*

Cell design

Chair: Martin Krebs, VARTA

- 15.00-15.15 Tobias Schmitt, HIU/Ulm University, *"3D Modelling and Simulation of Rechargeable Zinc-Air Cells"*
- 15.15-15.30 Simon Clark, HIU/DLR, *"Model-Based Development of Secondary Zinc-Air Batteries"*
- 15.30-15.45 Mathias Kjærgaard Christensen, DTU Energy, *"Rechargeable Zn-Air Batteries: Investigation of Capacity Limiting Effects Using DEMS"*
- 15.45-16.00 Closing remarks

Posters:

1. Borislav Ignatov Abrashev, Institute of Electrochemistry and Energy Systems, Bulgarian Academy of Sciences, *"Screening Impedance Analysis of Zn-air Cells"*
2. Borislav Ignatov Abrashev, Institute of Electrochemistry and Energy Systems, Bulgarian Academy of Sciences, *"Synthesis and investigation of nanosized NiCo₂O₄/Ag composite"*
3. Borislav Ignatov Abrashev, Institute of Electrochemistry and Energy Systems, Bulgarian Academy of Sciences, *"Electrochemical tests of the rechargeable Zn electrode for Zn-Air battery application"*
4. Cameron Bathgate, SINTEF/St. Andrews University, *"Performance screening of bifunctional catalyst material in 'near-neutral' chloride electrolyte for Zinc-air batteries"*
5. Christoph Müller, University of Duisburg-Essen, *"Investigation of the zinc-slurry conductivity to predict zinc-suspension electrode performance"*
6. Emmanouil Veroutis, Forschungszentrum Jülich, *"Nuclear Magnetic Resonance studies of PAN-based carbon fibers for cathodes in Zn-air batteries"*
7. Rose Oates, SINTEF/St. Andrews University, *"Synthesis and analysis of NiCo₂O₄ as a bifunctional electro catalyst in an alkaline media for Zinc air batteries"*

Practical information

Traveling to the venue

By plane

You can reach Ulm from the airports in Frankfurt, Stuttgart, and Munich. Take the train to travel from the airports to Ulm in approximately 2 hours.

By train

Plan and book your journey on www.bahn.de

Arrive at Ulm Central station

- Take Line 3 at the streetcar station into the direction “Wissenschaftsstadt”
- Exit at the stop “Botanischer Garten”
- Turn right and walk through the wood along “Helmholtzstraße”
- After 200 m the WBZU is on your right and the HIU on your left

By Car

From Stuttgart or Munich

Exit highway A8 at “Ulm West.” From there drive on the B10 toward Ulm/ Friedrichshafen and then exit at “Wissenschaftsstadt-Universität.” Turn left at the first intersection onto “Albert-Einstein-Allee” and then turn left twice to arrive at “Helmholtzstraße.”

From Nürnberg or Würzburg

Change from highway A7 at the “Elchingen” interchange to highway A8 toward Stuttgart. Continue by following the above directions (from Stuttgart or Munich).

From Kempten or Memmingen

Exit highway A7 at the “Hittistetten” interchange onto highway B10 toward Ulm. Continue through Ulm and then exit at exit at “Wissenschaftsstadt-Universität.” Turn left at the first intersection onto “Albert-Einstein-Allee” and then turn left twice to arrive at “Helmholtzstraße.”

Parking

It is possible to park in a parking garage. There is a fee for parking in spaces on the campus of University of Ulm.

Practical Information for Presenters

If you give an oral presentation, please send your presentation to zas.seminar@sintef.no at the latest June 22nd by 16.00. The organizing committee will be on site and will be glad to give you any assistance you might need. If you are a poster presenter, your poster should be put up as early as possible, and at the very latest before 10.45.

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