

Postdoc in solid state electrochemical TEM

Do you want to contribute to the green transition by developing Power2X technology? Would you like to perform complex experiments with a transmission electron microscope (TEM). Then we have an exciting opportunity for you.

Power2X is becoming a key technology in green energy infrastructures, and its core is electrolysis. The most efficient electrolysis technology is solid oxide electrolysis (SOEC), but the primary concern for implementing SOEC on a large scale is the loss of efficiency caused by cell degradation. The project is part of the ERC starting grant project HEIST. In HEIST we are developing operando TEM methods for analyzing degradation in SOECs during cell operation.

Responsibilities and qualifications

You will be working with a newly developed operando electrochemical method. With this method electrochemical experiments are performed inside an environmental TEM (ETEM) in reactive gases, at elevated temperatures and with electrical polarization. The goal is to obtain a better understanding of selected degradation processes in the cells.

You are expected to have the following qualifications

- Hands-on experience with transmission electron microscopy (TEM)
- Hands-on experience with focused ion beam (FIB)
- Knowledge about electrochemistry
- Knowledge about solid oxide electrolysis or solid oxide fuel cells

It would also be a good competence addition to our group if you have experience with

- Electron holography
- 4D-STEM

Eligible candidates should have:

- Good communication skills in English, both written and spoken
- The ability to work independently with high motivation
- A creative mindset for solving problems and identify new directions and opportunities in your project.

As a formal qualification, you must hold a PhD degree (or equivalent).

We offer

DTU is a leading technical university globally recognized for the excellence of its research, education, innovation and scientific advice. We offer a rewarding and challenging job in an international environment. We strive for academic excellence in an environment characterized by collegial respect and academic freedom tempered by responsibility.

Salary and terms of employment

The appointment will be based on the collective agreement with the Danish Confederation of Professional Associations. The allowance will be agreed upon with the relevant union.

The period of employment is 20 months. Starting date is 1 February 2024 (or according to mutual agreement). The position is full-time position.

You can read more about [career paths at DTU here](#).

Further information

Further information may be obtained from Associate Professor, Søren Bredmose Simonsen, sobrs@dtu.dk

You can read more about DTU Energy at www.energy.dtu.dk

If you are applying from abroad, you may find useful information on working in Denmark and at DTU at [DTU – Moving to Denmark](#).

Application procedure

Your complete online application must be submitted no later than **1 November 2023 (23:59 Danish time)**.

Applications must be submitted as **one PDF file** containing all materials to be given consideration. To apply, please open the link "Apply now", fill out the online application form, and attach **all your materials in English in one PDF file**. The file must include:

- Application (cover letter) - please reply to the following questions in your application:
 1. *What is your level of understanding of electrochemistry? (Possible answers: a. I am very well familiar, b. I know the basics, c. I don't know much)*
 2. *What is your level of understanding of solid oxide electrolysis? (Possible answers: a. I am very well familiar, b. I know the basics, c. I don't know much)*
 3. *Do you have hands-on experience with Focused Ion Beam (FIB)? (Possible answers: a. No, b. Yes, some hands-on experience, c. Yes, I have extensive hands-on experience)*
 4. *Do you have hands-on experience with transmission electron microscopy (TEM)? (Possible answers: a. No, b. Yes, some hands-on experience, c. Yes, extensive hands-on experience)*
- CV
- Academic Diplomas (MSc/PhD – in English)
- List of publications

Applications received after the deadline will not be considered.

All interested candidates irrespective of age, gender, disability, race, religion or ethnic background are encouraged to apply.

The Department of Energy Conversion and Storage (DTU Energy) is focused on education, research, and development within functional materials and their application in sustainable energy technologies. In a sustainable energy system a large part of the energy will be supplied by fluctuating sources such as solar and wind power. This makes it critically important to be able to convert and store the energy as needed. Our research areas include fuel and electrolysis cells, solar cells, and batteries as well as advanced filtration devices. We are approx. 250 employees.

Technology for people

DTU develops technology for people. With our international elite research and study programmes, we are helping to create a better world and to solve the global challenges formulated in the UN's 17 Sustainable Development Goals. Hans Christian Ørsted founded DTU in 1829 with a clear mission to develop and create value using science and engineering to benefit society. That mission lives on today. DTU has 13,500 students and 6,000 employees. We work in an international atmosphere and have an inclusive, evolving, and informal working environment. DTU has campuses in all parts of Denmark and in Greenland, and we collaborate with the best universities around the world.