Postdoc on optimized electrodes for industrial alkaline water electrolysis

Are you a postdoc skilled in reactor design and operation, with a genuine interest in topics such as electrochemical hydrogen production, green energy, energy transition, and carbon-neutral technologies? Consider joining us at the Department of Biological & Chemical Engineering, Aarhus University (Denmark). We are looking for a postdoc with expertise in designing, building, and troubleshooting (electro)chemical reactors and with a solution-oriented, problem-solving mindset. You will be part of a new project focused on optimizing the structures of electrodes for industrial alkaline water electrolysis. The project is in close collaboration with a global leading electrolyze manufacturer and it aims at accelerating the green transition.

Application Deadline:
15 August 2024

Faculty:
Faculty of Technical Sciences

Institute/Faculty:
Department of Biological and Chemical Engineering

Academic contact person:
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Vacant positions:
1

Hours per week:
37

Number of months:
24

Expected date of accession:
01/10/2024

Expected start date and duration of employment

This is a 2-year position starting from October 1st 2024 or as soon as possible thereafter.

Tasks

The project you will be a part of has the ambitious objective of developing new materials and solutions for alkaline water electrolysis (AWE) and it is in close collaboration with a global leading electrolyze manufacturer. The overarching goal is to reduce the cost of green hydrogen production.
The project aims to: 1) improve the electrode morphology through innovative technology and 2) understand and mitigate material degradation. The screening and selection of materials will be performed under conditions that mimic those used in industrially relevant applications.

The postdoctoral fellowship includes the following tasks:

- Building and continuously developing the pressurized reactors for electrode production.
- Collecting and visualizing real-time data, preferably by using Python, LabVIEW, or Matlab.
- Iteratively developing the 3D structures of electrodes.
- Assessing the performance of novel electrodes.
- Working in a team with external industrial partners who will provide specific components, operational conditions, and constraints.

Additional tasks might include all or some of the following:

- Electrochemical characterization of electro-catalysts using techniques such as EIS, CV, DPV, and CA.
- Coding in Python and/or Matlab.
- Quantifying gas (both hydrogen and oxygen) crossover under working conditions.

Qualifications

The applicant should have demonstrated excellence and hold a relevant PhD degree in Chemical Engineering, Mechanical or Production Engineering, or a similar field. The candidate should have proven skills in reactor design, construction, and operation, as well as data collection, measurement, and analysis. Preferably, the candidate will also possess knowledge of electrochemistry, electro-catalysis, and electrochemical techniques.
The successful candidate should be a team player, independent, and preferably have demonstrated leadership skills (extracurricular activities count). An open discussion approach and strong ethics are required for this position.

Position Requirements

Mandatory:

- Well acquainted with laboratory and safety procedures in a chemical laboratory,

including gas handling.

- Experience in developing, constructing, troubleshooting, and operating (electro-) chemical reactors.
- Skilled in devising and performing experiments, reducing data noise, using and maintaining research equipment, compiling, evaluating, and reporting test results.
- Problem-solving and solution-oriented mindset.
- Good communication skills, with experience in technical report writing and publication.
- Ability to work in a team, with collaboration and/or management skills.
- Ability to work independently and deliver agreed-upon results.

Desired but not mandatory:

- Experience in material characterization (structural and electrochemical).
- Experience in coding (preferably Python).
- Experience in electrochemistry or electrochemical engineering, including practical experience with electrochemical techniques (e.g., CV, EIS, CA, and DPV).

Who we are

Aarhus University, Department of Biological and Chemical Engineering (AU-BCE) encompasses more than 200 employees and five educations. The position is embedded in the section for Process & Materials Engineering, where the research focus is almost entirely on development of new sustainable solutions, materials and processes for the green transition. AU-BCE has strong competencies within all these technologies, associated process engineering and covers a large part of the TRL ladder. This includes basic research as well as activities within demonstration and pilot-scale testing of renewable energy technologies. Co-operation with other institutes, companies and universities both in Denmark and internationally is an integrated part of our culture.

What we offer

The department/centre offers:

- a well-developed research infrastructure, laboratories and access to shared equipment
- an exciting interdisciplinary environment with many national, international and industrial collaborators
- a research climate encouraging lively, open and critical discussion within and across different fields of research
- a work environment with close working relationships, networking and social activities
- a workplace characterised by professionalism, equality and a healthy work-life balance.

Place of work and area of employment

The place of work is Aabogade 40, 8200 Aarhus, Denmark, and the area of employment is Aarhus University with related departments.

Contact information

For further information, please contact: Assoc. Prof. Jacopo Catalano, jcatalano@au.dk, +45 23 35 46 93 and Assoc. Prof. Emil Drazevic, edrazevic@bce.au.dk , +45 93 50 83 45

Application deadline

Applications must be received no later than August 15, 2024.

Application procedure

Shortlisting is used. This means that after the deadline for applications – and with the

assistance from the assessment committee chairman, and the appointment committee if necessary, – the head of department selects the candidates to be evaluated. All applicants will be notified whether or not their applications have been sent to an expert assessment committee for evaluation. The selected applicants will be informed about the composition of the committee, and each applicant is given the opportunity to comment on the part of the assessment that concerns him/her self. Once the recruitment process is completed a final letter of rejection is sent to the deselected applicants.

Letter of reference

If you want a referee to upload a letter of reference on your behalf, please state the referee's contact information when you submit your application. We strongly recommend that you make an agreement with the person in question before you enter the referee's contact information, and that you ensure that the referee has enough time to write the letter of reference before the application deadline.
Unfortunately, it is not possible to ensure that letters of reference received after the application deadline will be taken into consideration.

Formalities and salary range

Technical Sciences refers to the Ministerial Order on the Appointment of Academic Staff at Danish Universities under the Danish Ministry of Science, Technology and Innovation.

The application must be in English and include a curriculum vitae, degree certificate, a complete list of publications, a statement of future research plans and information about research activities, teaching portfolio and verified information on previous teaching experience (if any). Guidelines for applicants can be found here.

Appointment shall be in accordance with the collective labour agreement between the Danish Ministry of Taxation and the Danish Confederation of Professional Associations. Further information on qualification requirements and job content may be found in the Memorandum on Job Structure for Academic Staff at Danish Universities.

Salary depends on seniority as agreed between the Danish Ministry of Taxation and the Confederation of Professional Associations.

Aarhus University's ambition is to be an attractive and inspiring workplace for all and to foster a culture in which each individual has opportunities to thrive, achieve and develop. We view equality and diversity as assets, and we welcome all applicants.

Research activities will be evaluated in relation to actual research time. Thus, we encourage applicants to specify periods of leave without research activities, in order to be able to subtract these periods from the span of the scientific career during the evaluation of scientific productivity.

Aarhus University offers a broad variety of services for international researchers and accompanying families, including relocation service and career counselling to expat partners. Read more here. Please find more information about entering and working in Denmark here.

Aarhus University also offers a Junior Researcher Development Programme targeted at career development for postdocs at AU. You can read more about it here.

The application must be submitted via Aarhus University's recruitment system, which can be accessed under the job advertisement on Aarhus University's website.

Aarhus University

Aarhus University is an academically diverse and research-intensive university with a strong commitment to high-quality research and education and the development of society nationally and globally. The university offers an inspiring research and teaching environment to its 38,000 students (FTEs) and 8,300 employees, and has an annual revenues of EUR 935 million. Learn more at www.international.au.dk/