

JOB POSTING

Recruiting organisation:

eChemicles Inc., Szeged, Hungary

Subproject title:

Design and fast prototyping of electrolyser cells applying 3D printing technology

Starting date:

1st September 2023 (or earlier if preferred)

Salary:

The Doctoral Network "MiEI" is financed by the European Union under the framework of the program HORIZON Europe, Marie Skłodowska-Curie Actions. The doctoral candidate will be hired for 36 months under contract by eChemicles Inc., with a monthly gross salary of approx. €2,700 (including mobility allowance, but excluding other allowances that depend on eligibility, e.g. family allowance, special needs allowance)

Background information:

Marie Skłodowska-Curie Doctoral Networks are joint research and training projects funded by the European Union. Funding is provided for doctoral candidates from both inside and outside Europe to carry out individual project work in a European country other than their own. The training network "MiEI" is made up of 10 partners, coordinated by Fraunhofer ICT in Germany. The network will recruit a total of 12 doctoral candidates for project work lasting for 36 months.

New industrial production strategies like "production on demand" and "Industry 4.0" are increasing the demand for new digital concepts for the chemical industry that are easily scalable and can work like a construction kit. In addition, the reduction of fossil fuel consumption requires novel synthesis concepts with on-demand capabilities paired with the use of electrical energy as a primary source for chemical processes.

MiEI will address this demand from the chemical industry, combining the advantages of electrochemistry, micro process engineering and flow chemistry. The recruited researchers will explore new models for electrodes and electrochemical flow cells, and develop innovative integrated prototype cells using printed circuit board (PCB) technology as a mass-scalable and flexible tool. These cutting-edge technologies will be applied to promising fine chemical and pharmaceutical synthetic routes, which will be further accompanied by techno-economic evaluation defining new business opportunities. The new MiEI technologies and processes will allow safe, flexible and sustainable synthetic routes for the chemical industry of the future.

Job description:

The advertized subproject is fully funded by the Marie Skłodowska-Curie European Training Network „MiEI“. It will be carried out by one doctoral candidate at eChemicles Inc. (PhD supervision at Dr. Csaba Janaky and Dr. Egon Kecsenvity, University of Szeged) over a period of 36 months.

eChemicles Zrt. is a company created by seasoned chemists, engineers and business developers with decades of experience in the electrochemical, catalysis, fine chemical and manufacturing industries. The mission is to develop innovative sustainable electrolyzer solutions to enable the chemical industry to reduce its environmental impact profitably. The company vision is to become the number one electrolyser technology provider producing valuable chemicals from waste CO₂ using renewable energy sources.

The recruited researcher will be focusing on additive manufacturing techniques for electrochemical cell design and fast prototyping with 3D printing technology. In detail, 3D design of electrochemical cells based on fluid dynamic heat/mass transfer models will be targeted, and the optimized cell design will be 3D printed from fluorinated or other chemically resistant polymers. The researcher will be responsible for the development of concepts for

sensor integration in these special electrochemical cells based on the industrial and academical questions which arise during the work. She/he will further transfer the methodology to evaluate the additive manufacturing/3D printing techniques for electrochemical cells regarding durability printing quality and efficacy, including investigation in the framework of life cycle analysis with MiEI participants. The researcher will also play an important role in the scale-up of these technologies to mass production.

Benefits:

The recruited researcher will have the opportunity to work as part of an international, interdisciplinary team of 12 doctoral candidates, based at universities and industrial firms throughout Europe. She/he will be supported by two mentors within the MiEI project, and will have multiple opportunities to participate in professional and personal development training. Through her/his work she/he will gain a unique skill-set comprising electrosynthesis, flow chemistry and process analytical technologies, as well as modern control engineering techniques. She/he is expected to finish the project with a PhD thesis and to disseminate the results through patents (if applicable), publications in peer-reviewed journals and presentations at international conferences.

As a member of a fast-developing and success-hungry team, you can see and learn about areas that go beyond the PhD topic, thereby broadening your future career opportunities. Company eChemicles also supports an optimal balance between family and career.

Requirements:

Qualifications / experience:

- In accordance with the European Union's funding rules for doctoral networks, applicants must NOT yet have a PhD
- Excellent Masters degree in chemistry or chemical engineering with further interest in

mechatronics or excellent Masters degree in mechatronics or mechanical engineer with open interest in chemistry

- Strong interest in electrochemistry and experimental cross-disciplinary work at the interface of mechatronics and engineering
- Familiarity with 3D modelling, CAD software or 3D printing experiments
- Working knowledge in the field of electrochemistry or mechatronics is advantageous
- Fundamental math and analytical skills including experience with data collection and data analysis
- Excellent communication skills and willingness to work in collaborative projects with multiple partners
- Ability to speak effectively in front of large groups (conferences, project meetings, customers)
- Very good English language skills
- Self-motivation and the ability to achieve goals independently as well as to contribute effectively to the team

Mobility:

The applicant must not have resided or carried out her/his main activity (work, studies etc.) in Hungary for more than 12 months in the past 3 years.

How to apply:

Please send your CV by e-mail (preferred) or by post, quoting the reference „MiEI 9DC-ECH“:

E-mail preferred:
egon.kecsenovity@echemicles.com

Budapesti út 9
6726 Szeged
Hungary

Application deadline: 7th March 2023