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***in operando* analysis of buried solid/solid interfaces in solid state batteries**

Work place: DMEX, Université de Pau et des Pays de l'Adour, Pau, Nouvelle-Aquitaine, France

Keywords: all-solid-state battery, interfaces, x-ray imaging, 4D, in-situ testing

Occupation: Research and teaching

Context

The position is part of the ambitious five-year “**RAISE 2024**”-project (towaRd All solld State battery in 2024) and is funded by the E2S (Energy Environment Solutions) Initiative (<https://e2s-uppa.eu/en/index.html>). The RAISE2024 project aims at **developing a pilot-scale prototype of a polymer based solid-state battery**. To that extent three academic laboratories (IPREM, DMEX and PDP) joined forces with two major international companies, Arkema and SAFT. Targeted applications are electric vehicles and renewable energy storage, with safety, high energy density, no self-discharge, a long stability/cycle life, easily scalable, low cost as main requirements.

Position and assignments

Interfaces are the key to all-solid-state batteries performance and lifetime but their study remains very challenging so far because they are buried in the entire battery stack. X-ray tomography is a technique which enables inner inspection of opaque objects at high resolution and in a non-destructive way. The current postdoc project aims to take this a step further: in operando observation of buried interfaces during successive load cycles. To that extent the postdoc will develop a tailored test cell and devise a protocol for in situ testing. He or she will set-up an image analysis pipeline to determine the morphological characteristics of the particles and pore network, and, using tailored image registration methods, identify their evolution over the battery's lifetime. The analysis will be complemented with post-mortem investigation of the regions of interest by means of SEM, ToF-SIMS or other techniques. This work is conducted in close collaboration with a PhD-student and other Postdocs.

The postdoc position also include teaching duty at UPPA (64 h per year).

- 18 months
- Position immediately available
- Gross salary: 2960 €/month

Profile request

The candidate has the following skills and expertise:

- A PhD in experimental physics, or an area with relevance to the project.
- A strong experience in x-ray imaging and electrochemical energy storage.
- Autonomy, dynamism, creativity, good communication skills.

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Application procedure: To apply, please send your CV and cover letter to peter.moonen@univ-pau.fr

Application deadline: April 15th, 2021