

Postdoc Position Aqueous Na-ion redox-flow batteries

Recent works from Yet-Ming Chiang group at MIT on semi-solid systems induced a new route for the development of redox-flow systems. This strategy allowed to increase the "concentration" of redox-centres in the electrolytes (posolytes and negolytes for the positive and negative compartment, respectively) compared to classical systems (Vanadium RFB for instance). This led to the formation of circulating liquid electrodes. However, this approach brings also numerous limitations, notably an increase of the electrolyte viscosity induced by the addition of carbon additives to obtain a good electronic percolation within the electrolyte. While recent progresses have been obtained in the electrolyte formulation engineering, this approach in the present state is still far from application for large scale systems.

In the proposed project, our objective is to develop and demonstrate the viability of new electrolyte chemistries based on the use of sodium-ion insertion materials and redox mediators. The advantage of this approach is to keep the energy gain of the semi-solid approach while limiting the viscosity drawback. This work will be based on the expertise of our laboratory on the chemistry of insertion materials and on the development of energy storage systems. Depending on the advancement of the work, the recruited postdoc could have to develop new experimental flow setups.

STARTING DATE: ideally September or October 2018

SKILLS/QUALIFICATIONS

The candidate should have a background in inorganic chemistry and electrochemistry with an experience in energy storage systems. A previous work on redox-flow systems will be highly appreciated. Excellent level of English, both written and spoken. International mobility will be a plus.

CONTACTS

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Selection process

The candidate should provide:

- a detailed CV
- a copy of the 3 most relevant publications/communications in relation with the position
- a motivation letter emphasizing the fit between the background and the proposed position
- the names and contact details of at least 2 reference persons