



## **POSTDOCTORANT FELLOW**

# **Design of new 5 Volt Electrolytes Via Electrolyte Genome Approach**

The development of new technologies for electrochemical energy storage is one of the main challenge of the next decades. Many hopes now rely on lithium-ion batteries (LiBs) that have invaded the market of laptops and which appear to be the best choice with the short time for electric vehicles, and perhaps for network applications (electricity storage from wind turbines or solar cells for example). Many works concern the search for cathodes with high-energy density but only few studies focus their research on the synthesis of new aprotic dipolar organic solvents for LiBs electrolytes. Thus, there is a need to deviate from traditional approaches for identifying new electrolytes stable to high voltage that are based on "Trial and Errors" approaches. To alleviate this issue a collaborative project funded by the French Research Agency (ANR) and reuniting multidisciplinary research groups that combines highly and specific complementary skills in organic chemistry, electrochemistry, solution chemistry, thermodynamics and theoretical chemistry was launched in October 2014. .

The postdoctorant fellow will work on the investigation of the electrochemical properties of the the new electrolytes synthesized at ENSCP. In particular, he will investigate their behaviour on negative electrode (graphite) and positive electrodes (NMC, LiCoO<sub>2</sub> and Lithium-rich phases) by cyclic voltamperometry and charge-discharge galvanostatic tests. A particular attention will be paid on the investigation of the oxidation mechanisms on these electrodes by means of chromatography techniques coupled with mass spectroscopy as well as passivative film formation on graphite by means of quartz microbalance, XPS, MEB and impedance spectroscopy. All of these investigation will contribute to improve our knowledge between the chemical structures of the electrolytes and their electrochemical properties in LiBs in order to formulate new electrolytes for high voltage batteries.

The postdoctorant fellow will work in a multiplidiscinary team including one PhD student in charge of basic electrochemical and physicochemical investigations and organic chemistry and two postdoctoral fellows in charge of QSPR and DFT calculations. The postdoctoral fellow will be located in Paris at College de France and ENSCP (these two laboratories are at few hunderd meters each other).

The postdoctorant fellow must have a PhD since less than 2 years and have skills in electrochemistry applied to lithium-ion batteries.

Candidates can apply by sending cover letter and CV et [alexandre.chagnes@chimie-paristech.fr](mailto:alexandre.chagnes@chimie-paristech.fr) et [jean-marie.tarascon@college-de-france.fr](mailto:jean-marie.tarascon@college-de-france.fr).