



POZNAŃ UNIVERSITY OF TECHNOLOGY

FACULTY OF CHEMICAL TECHNOLOGY
INSTITUTE OF CHEMISTRY AND TECHNICAL ELECTROCHEMISTRY



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Proposition of a Post-Doctoral position

“Effect of ionic liquid confinement in nanoporous networks on the performance of electrical double-layer capacitors”

We offer a 12-month Post-Doctoral position for a collaborative work in the frame of a MAESTRO project funded by the Polish National Science Centre (Narodowe Centrum Nauki - NCN).

The objective of the project is to develop solid-state electrochemical capacitors (EDLCs) of high energy density and able to operate in the temperature range from -50°C to 100°C. These EDLCs will implement ionic liquids (ILs) trapped in a porous polymeric membrane (so-called ionogels) as separator and hierarchical micro/mesoporous carbons as electrode materials.

The carbons of controlled pore size distribution will be produced by combined salt-hard templating; they will be characterized by physico-chemical techniques (temperature programmed desorption, gas adsorption, Raman spectroscopy, ...). The ionogels will be synthesized from IL binary mixtures, and the effect of confinement on the low temperature transitions will be studied by differential scanning calorimetry and nuclear magnetic resonance. These components will be implemented in pouch-type demonstration models of EDLCs, and the temperature dependence of their performance will be investigated by cyclic voltammetry, galvanostatic charge/discharge and electrochemical impedance spectroscopy. Models of ions and carbons/ionogels porosity will be generated to simulate the pore-ion interactions and propose optimizations of these components.

This work program is recommended for a chemist interested by fundamental and applied science, and aiming at developing a future carrier connected both with research and industrial developments. An excellent background in materials science and electrochemistry is required; skills in computation and modeling will be also appreciated. Good English speaking and writing is expected to prepare reports, power point presentations and also publications to be submitted in high impact factor journals. The candidate should be highly motivated and independent in conducting a research work, as well as have the willing to tightly collaborate with other group members.

Starting date of employment between July 1st and August 31st, 2021

Duration of employment: 12 months

Monthly salary: 7,500 PLN gross.

The candidates are requested to send the following documents **before May 22nd, 2021**:

- i) Curriculum Vitae, including a detailed description of research experience and foreign traineeships (if available), a list of publications and presentations in conferences;
- ii) Recommendation/reference letters from their previous scientific supervisors;
- iii) a detailed motivation letter explaining the interest/fitting for the research topic;
- iv) copies of the most representative research publications (maximum 3);
- v) attested copies of education certificates including grade reports and other documents

to Professor F. Béguin (francois.beguin@put.poznan.pl).

Applications with any missing information/document or including general purpose files which are not directly related to the advertised position will not be considered.

More information on the Power Sources Group website: <http://powersourcesgroup.put.poznan.pl/>