

STudent REseArch Mobility Programme (STREAM) Project proposal



Host University:
Université Paris-Sud

Field (drop-down list):
Natural sciences, mathematics and statistics

Specified field, subject:
Electrochemistry, physical chemistry, renewable energy

Research project title:
New generation of thermogalvanic cells: design, development and performance

Possible starting month(s):

Sep	Oct	Nov	Dec	Jan	Fev	Mar	Apr	May	Jun	Jul	Aug
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Possible duration in months:

1	2	3	4	5	6	7	8	9	10	11	12
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Alternatively, exact starting and end date: from date to date

Suitable for students in: Bachelor level Master level

Prerequisites:
Bachelor of Science degree (or equivalent) in Chemistry or Physics

Description (maximum 2,000 characters):
The thermogalvanic cells represent an attractive way for the conversion of residual heat into electricity. Their functioning is based on the creation of a potential difference between two identical electrodes maintained at different temperatures in solution. However, such approach has serious limitations because of the use of volatile aqueous and organic solvents. In this context, room temperature ionic liquids (a new class of liquids with negligible vapour pressures and high ionic conductivities) are interesting candidates to replace conventional electrolytes. The main objective of the project is to find a suitable system (redox couple - ionic liquid - electrode) to develop high performance devices. Several aspects will be studied, including physicochemical properties of the medium and thermodynamics and kinetics of the redox reaction.

Analytical methods: measurements of density and viscosity, thermal gravimetric analysis, potentiometry, cyclic voltammetry, UV-visible spectrophotometry and IR spectroscopy. Numerical simulations of electrochemical processes with the use of Comsol Multiphysics software can be also performed at the end of this training.



Comprendre le monde,
construire l'avenir



Faculty and/or Department:

Chemistry Department, Institute of Nuclear Physics

Contact person, including position:

Séverine Fogel, Head of International Relations

Contact email:

severine.fogel@u-psud.fr

Deadline for nomination to reach host university:

2 months before the starting date

Notification of admission given by the end of:

Within 3 weeks

Additional information:

Medical certificate to work in laboratory is mandatory



Comprendre le monde,
construire l'avenir

