

## **PhD position in the heart of Europe - Nancy, France**

Laboratoire Réactions et Génie des Procédés (Laboratory of Reactions and Process Engineering)

CNRS-Université de Lorraine (CNRS-University of Lorraine)

LRGP-ENSIC, 1 rue Grandville, BP 20451, 54001 Nancy, France

### **Study of the graft (co)polymerization of styrene onto ground tire rubber powder**

#### **General context**

Rubber is a common material, mainly used in the automotive industry. As a result, large quantities of waste tire rubber are produced every year. The cross-linked structure of waste tire rubber (also known as ground tire rubber, GTR) along with the presence of stabilizers and other additives, inhibits its degradation process thus resulting in serious environment issues.

A solution to this problem is the re-use of GTR particles in different applications, such as fillers in thermoplastics, elastomers and thermosets. However, the incorporation of GTR powders into a number of polymer matrices significantly impairs the mechanical properties of the resulting material, even at low rubber content, due to poor adhesion issues between the two materials as well as to the relatively large particle size of GTR.

The objective of this work will be to study the free-radical grafting polymerization and/or copolymerization of different vinyl monomers onto the rubber particles, in order to improve the mechanical properties of the produced (co)polymer. The work comes in continuation of another PhD Thesis and will involve the study of the different steps of the GTR pre-treatment, (co)polymer synthesis and characterization processes.

#### **Requirements**

We are looking for a PhD candidate with basic understanding in chemical engineering, polymer engineering & science and/or materials engineering. The candidate should be highly motivated, a team player and willing to participate in the development of original processes and new set-ups. Written and spoken English should be excellent. Any level of French is a plus.

**Monthly salary:** ~1750 € gross (~1350 € net)

**Starting date:** September, 2015

#### **Contact**

CV, one or two letters of recommendation & copies of analytical course/notes certificates to:  
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