6-Month Internship Opportunity in Experimental Study of Mechanical and Thermal Properties of Polyisobutylene (PIB) based on Iron Oxide Nanoparticle with tunable size and surface chemistry

Laboratory Description:

The Roberval Laboratory at the University of Technology of Compiègne offers an internship opportunity in materials science research. The laboratory is recognized for its commitment to innovative projects and excellence in training future researchers.

Internship Mission:

The intern will contribute to an experimental study to analyze the mechanical and thermal properties of composite materials made of iron oxide nanoparticles embedded in polyisobutylene (PIB) matrix. Three sizes of iron oxide nanoparticles (12 nm, 8 nm, and 4 nm) will be investigated, each functionalized with three different ligands (octanoic acid, lauric acid, and oleic acid), totaling nine iron oxide nanocomposites to be prepared and tested. The aim is to understand how the interface between the coated nanoparticles and polymer, which controls the final properties of the polymer nanocomposites, may vary depending on the nanoparticles' size and ligand.

Key Tasks:

- ✓ Preparation of iron oxide nanocomposites through a simple mixture of polyisobutylene (PIB) and nanoparticles, choosing the right solvent to ensure optimal dispersion.
- ✓ Conducting tensile tests on the nanocomposites.
- ✓ Conduction DMA testing
- ✓ Analysis of results using techniques such as Differential scanning calorimetry (DSC), Thermogravimetric analysis (TGA), and scanning electron microscope (SEM), with interpretation of obtained data.

Profile:

- ✓ Student in materials science, chemistry, or a related field.
- ✓ Basic knowledge of nanotechnology and materials characterization.
- ✓ Independence and precision in conducting experiments.
- ✓ Good communication skills and a team player.
- ✓ Bac+4 or Master's Bac+5 degree

Internship Conditions:

- ✓ Duration: 5 to 6 months
- ✓ Location: Roberval Laboratory, University of Technology of Compiègne
- ✓ Compensation provided

Application Procedure:

Send your CV and cover letter to [fahmi.bedoui@utc.fr] and [sakina.meftah@utc.fr] before 31/12/2023.