

'Empa - the place where innovation starts'

Empa is the research institute for materials science and technology of the ETH Domain and conducts cutting-edge research for the benefit of the industry and the well-being of society.

Laboratory of Advanced Fibers (Department of Functional Materials) is currently looking for a

'PhD student in the field of Improving Sustainable Plastics Chemistry'

As the population of the world grows and the natural resources become scarce, there is an increased impetus in the scientific and industrial community to innovate and develop sustainable functional materials. Improving the functionality and use of bioplastics like **PLA (polylactic acid)** is an important step in this direction. As a bioplastic, PLA is biodegradable and offers an excellent balance of mechanical properties and processability. However, like many organic polymers, it is flammable. This project will enable the use of PLA in fire-safe applications such as home and office textiles (upholstery, furnishing), electronics (packaging and casing), transportation (floor mat, headliners, outer skin material for door trim), and building (insulation).

The research focuses primarily on development of phosphorus containing monomers, which will be integrated in the backbone of PLA via reactive extrusion process. By incorporating specially designed monomers in the PLA macromolecules, we will not only make PLA flame retardant but also prevent leaching of flame retardant additive from the polymer. This **SNF/ANR project** is in collaboration with **UMET, University of Lille**. Empa's goal in this project is to develop new functional monomers and perform preliminary copolymerization experiments with lactide, whereas UMET will focus on reactive extrusion processes involving new monomers and Lactide.

Your profile:

- Masters in organic chemistry (experience in organophosphorus chemistry would be beneficial)
- Knowledge of polymers and polymer chemistry
- Willingness to actively get involved in polymerization, thermoplastic polymer processing, reactive extrusion and analytical characterization of produced polymers

This position is immediately available for a planned duration of 36 months. It is intended that the PhD student will be registered as a Doctoral student in ETH, Switzerland. You will work in an international interdisciplinary team with state of art facility in organic synthesis, analytical, small scale fire laboratory, polymer analytics and processing, with instruments such as NMR, GPC, UPLC-MS, GC-MS, thermal analytics including TGA, DSC and cone and micro combustion calorimeters.

For further information about the position, please contact **Dr. Sabyasachi Gaan**, sabyasachi.gaan@empa.ch and visit our website www.empa.ch.

We look forward to receiving your online application including a letter of motivation (one page), CV including full publications list, diplomas with transcripts of records and contact details of at least two referees that we may contact. Please upload the requested documents through our webpage www.empa.ch/jobs. Applications via email will not be considered.