

PhD position of three years at the Polymer Materials Engineering (IMP-INSA de Lyon) - Offer valid until January 30

A 36 months PhD position financed by the University of Lyon through the IDEX label (This award recognizes us as an international academic site of excellence) is opened within a tight multidisciplinary collaboration between the **Polymer Materials Engineering Laboratory** (IMP, INSA Lyon, <http://www.imp.cnrs.fr/>) and the Laboratory of Chemistry of ENS de Lyon (http://www.ens-lyon.fr/CHIMIE/laboratory/directory/padua-agilio?set_language=en&cl=en).

Short Abstract:

The purpose of 4D IOLIMAT (4D printing for designing innovative ionic liquid-based polymer materials) project is to overcome various challenges in the field of epoxy networks through the design and development of new and high performance (multi)functional-dedicated polymer materials with enhanced properties such as ionic conductivity, chemical, and thermal stabilities, mechanical performances, fire retardancy, barrier properties, self-healing ability and shape memory behavior for 3D/4D printing. 4D IOLIMAT project proposes an original and innovative approach for designing and processing new polymer networks from novel ionic liquid monomers. To achieve innovative networks with high performance, the development of facile and adaptable synthetic routes will be investigated in order to design and characterize polyfunctional Ionic Liquid monomers bearing aromatic rings and specific reactivities which will allow to tune the architectures of the networks and a function of targeted properties in the resulting polymer materials. To manage this 36-months project, thanks to the large and complementary expertises of the two involved teams (LCH, IMP) in organic synthesis (design of functional ILs), physico-chemistry of ionic liquids (interface properties, solubilization, transport, modeling by molecular dynamics simulation), polyaddition and cationic reaction-based polymerizations (epoxy-IL/amine polyaddition and cycloaliphatic epoxy-IL cationic photopolymerization), polymer-ionic liquids interactions, and architecture and properties of networks, the identified risks of the project are limited and alternative routes are already identified to ensure the success of this ambitious project which will lead to fully innovative specialty materials based on polymer networks.

The candidate with a CV more oriented polymer materials with an appeal for chemistry (the candidate will be supported by a postdoc on this part) will work at IMP laboratory in Lyon and many international collaborations are planned allowing the candidate to have an international profile. Good knowledge and skills in polymeric materials are mandatory as well as basic knowledge in organic chemistry would be appreciated. In addition, we expect for the candidate a good scientific English writing and communication.

The salary will be: 1600 euros net/month; Computer provided by the laboratory; national and international conferences (mandatory), and a minimum of three articles will be required during the PhD.

Please send your CV with a minimum of 1-2 contact persons and a motivation letter to:

jannick.duchet@insa-lyon.fr (Professor)

sebastien.livi@insa-lyon.fr (Assistant Professor)