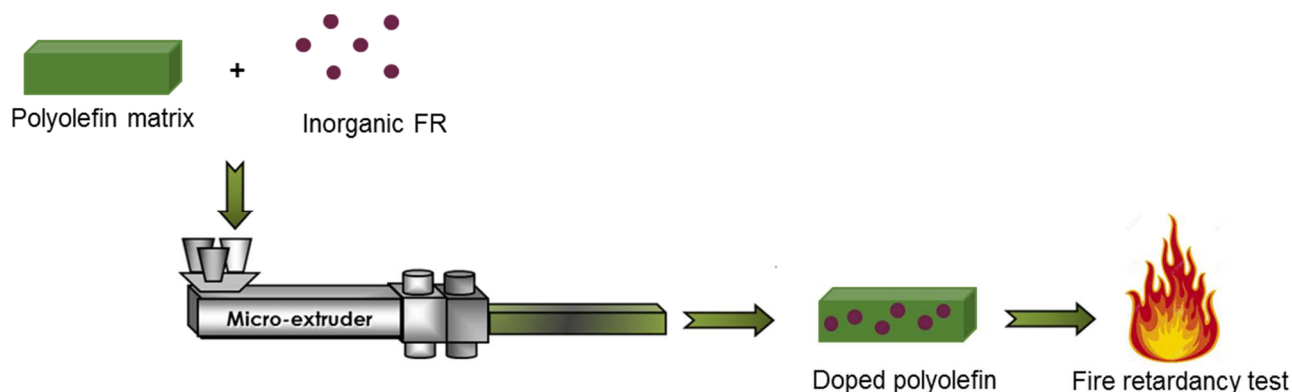


Subject Proposal for Erasmus Students in Chemistry (Master Level)

**“Development of Inorganic Flame Retardants for Fireproofing of Polyolefins”**

Fire retardancy research is constantly evolving, due especially to the increased legislation on safety and protection of persons and property. Several methods to obtain flame-retarded materials, and particularly of polymers, can be envisaged: surface treatment, chemical modification of monomers, incorporation of fillers or additives. This is the additional way that we propose to explore. Indeed, the addition of specific additives (also called flame retardant) makes it possible to improve the fire behavior of the material. At present, there is no (or few) satisfactory solution and it is therefore necessary to develop novel flame-retarded polymer materials.

Thus, the topic of this internship is the development of inorganic flame retardants (RF) for the flame retardancy of polyolefins. The first part of the study will consist of selecting the most relevant flame retardants to be associated with the polymeric matrix (s) to be flame retarded in order to develop the polymer / additive composites. These materials will be developed at laboratory scale by microextrusion methods. The second part will be devoted to the evaluation of the flame retardant properties of these composites using conventional fire tests (UL-94, L.O.I., Cone calorimeter). The third part will be to elucidate and to understand the mechanisms of action brought about by original methods developed in the laboratory (infrared thermography, high temperature rheology, etc.).



*Placement : UMET Laboratory at ENSCL, March-July 2018, salary of 500 a month.*

*Keywords : Fireproofing, Inorganic flame retardants, Polyolefins*

*Contacts : Dr Fanny Bonnet ([fanny.bonnet@ensc-lille.fr](mailto:fanny.bonnet@ensc-lille.fr))*

*Dr Gaëlle Fontaine ([gaelle.fontaine@ensc-lille.fr](mailto:gaelle.fontaine@ensc-lille.fr))*

*Zahia Turpin ([zahia.turpin@ensc-lille.fr](mailto:zahia.turpin@ensc-lille.fr) in cc)*