

PhD offer: New membranes with hydrophilic surface based on biodegradable and bio-based polymers for microfiltration (10/05/2021)

There is now a growing need for membranes based on environmentally friendly polymers (biodegradable polymers) as one of the possible solutions to the problem of plastic waste management. Polylactide (PLA) is a biodegradable and bio-based polymer which exhibits very good physical, mechanical and biological properties. PLA will be synthesized by ring-opening polymerization of L-lactide or D-lactide. The membrane is prepared by phase separation induced by a non-solvent. The objective of this project is to develop new membranes based on PLA and with a hydrophilic surface for microfiltration. The membrane will be treated in two stages with a coating of polymethylhydrosiloxane (PMHS) to create reactive SiH functional groups on the surface of the pores for subsequent functionalization with various substituents bearing hydrophilic zwitterionic groups (Ex. sulfobetaine or carboxybetaine). Finally, filtration tests of water/oil solutions or solutions containing proteins will be carried out on a laboratory scale to evaluate the potential of biodegradable membranes in comparison with conventional membranes.

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