

## New eco-composites based on polyhydroxyalkanoates (PHA) for marine applications

Norma Mallegni<sup>1</sup>, Patrizia Cinelli<sup>1,2</sup>, Elena Balestri<sup>1</sup>, Andrea Lazzeri<sup>1</sup> and Maurizia Seggiani<sup>1</sup>

<sup>1</sup>University of Pisa, Italy

<sup>2</sup>Institute of Chemical Physical Processes - National Research Council, Italy

Bio-based polymers have attracted increasing attention over the last two decades, predominantly due to their environmental friendly nature and no dependence on petroleum resources. This type of polymers has got a growing consideration which has been so far focused specifically on starch based products, PLA (Polylactic acid), PHA (Polyhydroxyalkanoates) in particular PHB (Poly hydroxyl butyrate), cellulose derived plastics, etc. The production of these materials is based on renewable agricultural and biomass feedstocks. The degradability of bio-based materials not just in compost but also in different natural environments is an important property for sustainability and reduction of plastic pollution. In this work, blends of PHA and PHB with *Posidonia Oceanica* fibres were investigated to assess the feasibility of producing materials biodegradable in marine environment, varying the fiber percentage from 10 to 30 wt%. The chemical composition of the *Posidonia O.* fiber is similar to that of other lignocellulosic materials. It consists mainly of cellulose, hemicellulose, and lignin. Thermal, rheological, mechanical and morphological characterization of the developed PHA/PHB-fibre blends has been conducted in order to investigate the effect of the fibres on their processability and tensile properties. Biodegradability of the produced composites has been investigated in sea water in view of their use in marine environment.

### Biography

Norma Mallegni is a PhD student in University of Pisa, Department of Civil and Industrial Engineering. She had a Master's degree in Chemistry and is working on copolymerization, blending and processing of bio-based polymers for tuning properties and sustainability of bio-based materials.

[norma.mallegni@gmail.com](mailto:norma.mallegni@gmail.com)

### Notes: