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Smart Material 2021: Optimization of the production of nanoplastics - Francesca Lionetto - University of Salento, Italy

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Abstract

Micro/nanoparticles based on synthetic and natural polymers are finding increasing applications in several fields, thanks to innovative technological solutions and the establishing of a circular economy model. However, in addition to multiple benefits for society, micro/nanoparticles are also responsible of water, air and soil pollution together with secondary microplastics (MPs) and nanoplastics (NPs), originated from plastic waste fragmenting and degradation. Although the huge interest, the chemical vector role of micro/nanoplastics, their fate and the negative effects on the environment and human health is still under discussion and the investigations are still sparse. Moreover, the study of the MPs and NPs pollution relies on the availability of environmentally relevant engineered nanoparticles for toxicological, transport and adsorption studies in biological tissues as well as the design of innovative engineered micro/nanoparticles to overcome that toxicological, pollution, and health issues.

In this work, a reliable method has been set up to produce polyethylene terephthalate (PET) nanoparticles which are relevant for environmental impact studies. The size, morphology and chemical-physical properties have been characterized in order to optimize the process parameters and to evaluate the potential to be used as a model NPs for studies on biological tissues.

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