



***Ph.D. School in Chemical Sciences
Cycle XXXVIII***

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Research project title: Chemical and thermomechanical recycling of post-used petroleum and bio-based plastics coming from the Italian production chain

Key words Chemical recycling, thermo-mechanical recycling, plastics, bio-plastics, circular economy

Research project abstract The dispersion and accumulation of plastics in the environment is a world concern. The European Union set new objectives providing the recycling of 70% of all kinds of plastic packaging by 2030. Therefore, the application of the well-consolidated principles of the circular economy becomes of crucial importance for the environmental safety against plastic waste pollution. To this aim, the recovery and recycling of post-used plastic materials represent the key approach to remove them from landfills and/or the uncontrolled abandonment in the environment. The research project of the proposed PhD program is part of this theme, which is a crucial issue for the academic and industrial world. They both envisage, as fundamental objectives, the study of thermo-mechanical and chemical recycling methodologies of traditional plastics and bioplastics to include them in the production chain of new plastic products, thus providing a valid option for their disposal at the end of their use. The thermo-mechanical processes will be properly used to recycle post-use plastics, whereas the chemical recycling will provide the synthesis of new polymers from the monomers obtained through the feedstock recycling of plastic waste, with the aim of obtaining new plastic-based materials and new products.