# Chemical-physical, structural and morphological characterization of new recycled materials for circular economy
### *(Proposer: Prof. Gabriella Salviulo)*

The research project fits into a bigger frame devoted to investigate smart and sustainable materials for circular and augmented industrial products and processes. The development of sustainable processes for the chemical recycling of domestic and industrial waste to useful, reprocessable chemicals, added-value products and materials, aiming to foster the transition from a Linear to Circular model. Waste is used as secondary raw materials for manufacturing, to minimize depletion of natural resources, while maximizing removal of scraps and pollutants form the environment. Establishment of new concepts and technologies, and their validation on the bench scale, will help to convert a problem into an opportunity, with clear, cross-effect on several manufacturing industries.

In this contest it is essential to attest the circularity of the new recycled materials. End-of-Waste criteria, which legally establish when recycling materials cease to be considered as waste and obtain the status of marketable products, is a fundamental step to allow circular reuse of materials reducing the amount of waste to be landfilled and contributing to save non-renewable resources. To define the status of the EoW, for each of the new materials leaching tests, chemical-physical, structural, morphological characterization and ecotoxicological assessment will be carried out.

The research project will be focused on a deep structural, bulk and surface, spectroscopic and chemical characterization by X-Ray powder diffraction, Electron Microscopy (SEM and TEM), micro-raman and infrared spectroscopy, X-Ray photoelectron spectroscopy and dynamic light scattering (DLS) of the new produced materials.

**Collaborations:** The project will be performed with the collaboration of Prof. Maria Cristina Lavagnolo (DICEA, Unipd).