Minicolloque n° CPR6 ☑**Oral** ☐ **Poster**

Polymer science and microplastics in the environment

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Microplastics (MP) are found in various environments. Macroplastics are identified as a major source of MP because of their degradation over time under abiotic and biotic factors [1].

Collaboration with the Tara Foundation for the mission “Microplastics 2019” paved the way for developing methods to extract and analyze MP from samples collected in rivers [2]. Moreover, three projects sponsored by the ADEME aim to evaluate MP contamination in soils: MicroSof, Biomaleg and PRO. Chemical digestions are applied to extract plastic particles from complex matrices containing organic and inorganic matter in order to analyze them by infrared spectroscopy. The key challenges of these processes are to be able to extract MP efficiently while keeping their integrity for further characterizations [3]. Thus, polymer alteration during the extraction step can be detrimental to the following analyses such as particle quantification or infrared spectroscopy for instance.

Polymer science could help to develop and better control these processes.

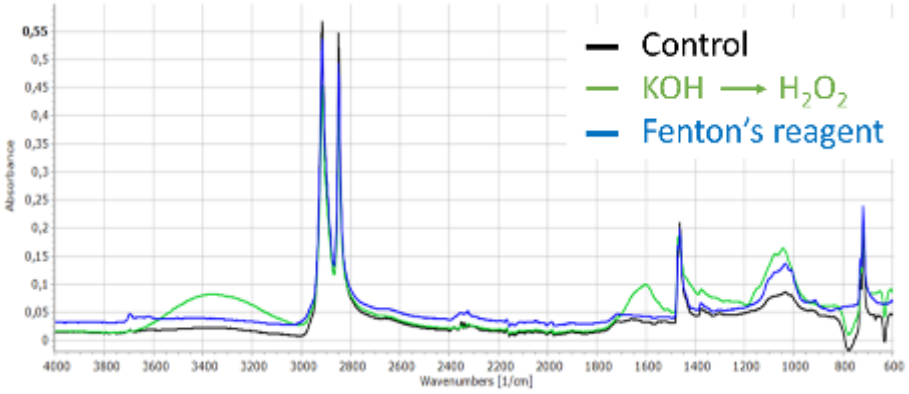

Figure 1: ATR-FTIR spectra of a PE microplastic before and after two organic matter removal methods: a combination of an alkaline step followed by an acidic digestion or a catalyzed oxidative digestion, the Fenton’s reagent [2]

[1] A. A. Koelmans et al., « All is not lost: deriving a top-down mass budget of plastic at sea », Environ. Res. Lett., vol. 12, no 11, p. 114028, 2017.

[2] L. Fertala et al., « Organic matter digestion methods for microplastic extraction from estuarine samplings », MICRO 2020 Conference, 2020.

[3] J. C. Prata et al., « Identifying a quick and efficient method of removing organic matter without damaging microplastic samples », Sci. Total Environ., vol. 686, p. 131‑ 139, 2019.