

Metrological traceability of measurement data from nano- to small microplastics for a greener environment and food safety

A. M. Giovannozzi

Istituto Nazionale di Ricerca Metrologica (INRiM), Quantum Metrology and Nanotechnology Division, Strada delle Cacce, 91, 10135 Turin, Italy

Plastic pollution is recognised as a severe anthropogenic issue globally, where complex physico-chemical transformation processes (such as aging, degradation and fragmentation) producing Microplastics (MPs) and, subsequently, Nanoplastics (NPs). These processes occur during production, consumer use, waste processing, as well as through environmental process after vehicles/industrial emissions. Several studies have reported the occurrence, analytical methods and toxicity of larger MPs in the environment and food matrices. However, MPs (< 100 µm SMPs) and NPs (< 1 µm) in natural systems have been overlooked, primarily due to significant methodological challenges associated with their micro- and nano-specific properties.

In this respect, the European Commission (EC) commissioned a study focused on the potential ecotoxicological impacts of smaller plastic particles (SMPs/NPs), encouraging research aimed at a more accurate characterisation of both materials and exposure conditions. The need for efficient and reliable measurement infrastructure is required in support of (i) ECHA's proposed restriction targeting intentionally added MPs in consumer products, which requires specific thresholds for litter types after harmonisation of the methodology, (ii) the new Drinking Water Directive (DWD) that mentions MPs explicitly, and (iii) the new Circular Economy Action Plan (CEAP) adopted in March 2020.

The recent funded project "21GRD07 PlasticTrace" (Metrological traceability of measurement data from nano to small-microplastics for a greener environment and food safety) within the European Partnership on Metrology aims to address the urgent need for development and harmonisation of methods for the chemical identification, physical characterisation and quantification of released small micro/nanoplastics (SMPs/NPs) in drinking water, food and environmental matrices, as required by the EU's CEAP.

An overview of the main objectives and the early outcomes of PlasticTrace will be described and presented to show the benefit to industry and monitoring agencies, and to strengthen the involvement of key actors, from SMEs to globally leading instrument producers, commercial laboratories, leading food producers and national / international environmental agencies.

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* E-mail: a.giovannozzi@inrim.it