Contribution ID: **36**   Type: **not specified**

Sampling and Identifying Airborne Microplastics: Techniques, Findings, and Challenges

Wednesday 3 December 2025 16:35 (12 minutes)

Airborne microplastics (MPs) have emerged as an increasingly recognized component of atmospheric pollution, yet their sampling, characterization, and quantification remain challenging due to their diverse physical forms and low ambient concentrations. This sharing session provides an overview of the approaches and research in microplastics sampling in outdoor and indoor air environments. Emphasis is placed on developing reliable sampling strategies which include active and passive collection methods to ensure representative capture of fibres, fragments, and other types. The session also highlights analytical workflows, including sample pre-treatment, microscopic identification to determine size, shape, colour characteristics. To identify the polymer composition of collected MPs, micro-Raman spectroscopy is employed as a key analytical tool. This technique enables fingerprinting of individual particles, allowing differentiation between common polymers such as polyethylene, polypropylene, polystyrene, and polyester. Findings from recent studies indicate that fibres consistently dominate airborne MP profiles, particularly in indoor environments. Environmental conditions such as increased wind speed have been shown to elevate MP concentrations, while higher relative humidity tends to reduce airborne particle suspension. Micro-Raman analysis further reveals a prevalence of synthetic textiles mainly polyester and rayon suggesting strong contributions from human activities and indoor sources.

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Session Classification: Pollutants and sources