

## The Challenge of Matrix Interference in Quantitative Analysis of PM<sub>2.5</sub> Microplastics Using Pyrolysis–Gas Chromatography–Mass Spectrometry

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### Abstract:

We evaluated the effect of ammonium sulfate, a major component of airborne particulate matter, in the quantification of airborne micro- and nanoplastics (AMNPs) by analytical pyrolysis–gas chromatography–mass spectrometry (Py-GC/MS). Analytical pyrolysis has shown promising potential in providing mass-based information on AMNPs, which are compatible with established standard protocols to monitor airborne particulate matter. Py-GC/MS can be performed with little to no sample preparation, minimizing the risk of polymer loss or sample contamination. However, reactive components of particulate matter, such as inorganic salts, can interfere with the Py-GC/MS measurement of polymers, leading to over/underestimation of the polymer content and instrument contamination. In this study, we have shown that ammonium sulfate can generate matrix interference in the quantification of AMNPs in PM<sub>2.5</sub>. We have provided a solution to this issue based on water rinsing of the particulate matter directly inside the pyrolysis crucible, avoiding sample loss and preventing instrument contamination.

\* Excerpted from online journal website (Click the title)

### Frontier Labs Products used:

Multi-Shot Pyrolyzer (EGA/PY-3030D), Auto-Shot Sampler (AS-1020E), MPs-SiO<sub>2</sub>-L, PY1-EC80HF, Vent-free GC/MS Adapter