

[Into the Nanograms-Sensitive Detection of Microplastics in Passively Sampled Indoor Air Using F-Splitless Pyrolysis Gas Chromatography Mass Spectrometry](#)

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Abstract:

The presence in the atmosphere of airborne plastic, referred to as microplastic, results from the large quantities of plastic waste produced by humans. Microplastics can have an impact on human health. In this study, we investigated the analysis of indoor airborne microplastics by pyrolysis-gas chromatography/mass spectrometry (Py-GC/MS). Py-GC/MS can be used to identify and quantify various types of microplastics. Indoor air was passively sampled using quartz fiber filters. In one instance, active sampling was used for comparative purposes. Sample preparation was limited and consisted only of cryomilling the quartz filters used for sampling to ensure homogeneity. F-Splitless pyrolysis, which is accomplished by forcibly redirecting flows, was used to transfer all the pyrolyzates of the microplastics to the GC/MS system. The results demonstrate that F-Splitless Py-GC/MS can be used to identify and quantify microplastics at the nanogram level. This method enables the rapid characterization and quantitation of microplastics in particulate matter (PM) air filters with minimal sample preparation, direct measurement of the sampling media, and nanogram-level sensitivity, thereby, allowing researchers to ascertain the magnitude of the microplastic threat in environmental air.

* Excerpted from online journal website (Click the title)

Frontier Labs Products used:

Multi-Shot Pyrolyzer (EGA/Py-3030D), IQ Mill 2070, MFS-2015E, MJT-2030E, UAMP column kit, F-Search MPs, MPCs