(Supplementary Material)

A new filtration system for extraction and accurate quantification of microplastics

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<Discussion for the limitation of MFS on its use for high matrix sample>

Figure S1 illustrates the results of filtering a sample pretreated with H_2O_2 and density-separated using MFS, including both a microscopic image of the filter section and Py-GC/MS analysis results. For samples containing substantial amounts of biomass, such as cotton dust, which are inadequately pretreated with hydrogen peroxide, the bottom surface of the filter becomes clogged, leading to a significant increase in the liquid level during the filtering process. Py-GC/MS analysis also reveals a large number of peaks, including a prominent peak for levoglucosan, a cellulose degradation product, in addition to microplastics (Fig. S1(b)). In contrast, for samples with proper pretreatment using H_2O_2 and density separation, MFS enables smooth recovery of microplastics, with the levoglucosan peak visible but with clear observation of microplastic degradation products in the Py-GC/MS analysis (Fig. S1(b)). This underscores the importance of thorough organic matter removal and density separation when using MFS, although it is also crucial for CFS.

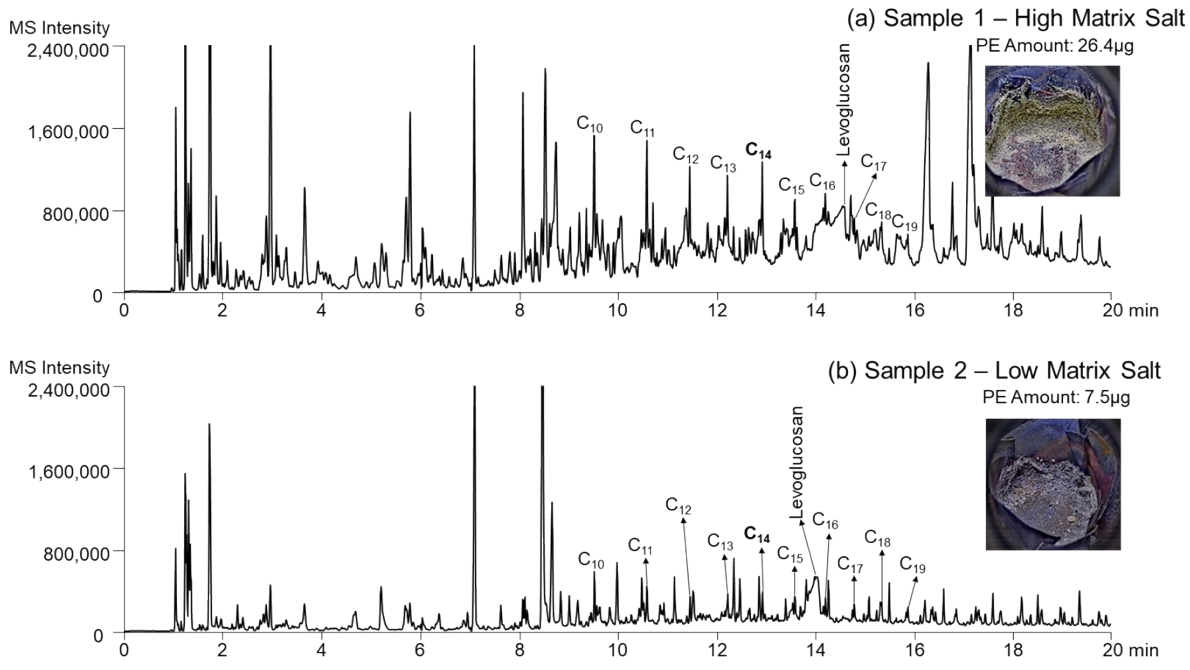

Fig S1. The MFS high and low matrix salt filters during the pre-processing step.