FRONTIER LAB

Perfect for direct collection of microplastics in drinking water

NEW

Smart Fine Particle Collector (SFPC)

The pretreatment of clean water samples in microplastics (MPs) analysis commonly involves the use of vacuum filtration. This device allows users to choose the appropriate collection approach based on the analytical method and sample water volume (typically less than or greater than 1 liter), ensuring efficient collection of MPs from water samples.

Features

1. **Three collection methods can be selected depending on analysis technique and sample water volume.**

Analytical method	Amount of sample	Collection method
Py-GC/MS	< 1 L	(A) · (B)
	≧ 1 L	(C)
Micro FT-IR	< 1 L	(B)
Micro Raman	≧ 1 L	(C)

(A) Collecting in a cup

(B) Filter paper (S)

(C) Filter paper (L)

Refer to the back page for collection methods details.

2. **Py-GC/MS analysis can be performed after spectroscopic analysis**

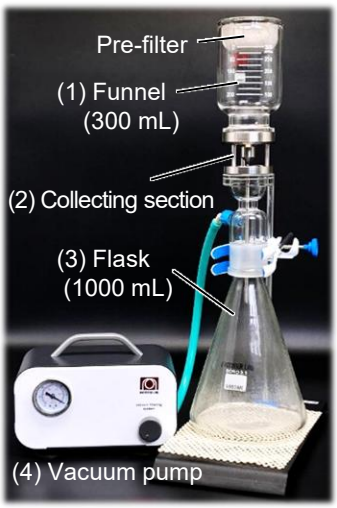
The Filter paper methods (B) and (C) allow Py-GC/MS analysis after non-destructive analysis, such as spectroscopic analysis.

3. **Newly developed collection cup with a metal filter**

Method (A) uses a newly designed collection cup with a built-in metal filter, allowing direct Py-GC/MS analysis of collected MPs.

Components of SFPC

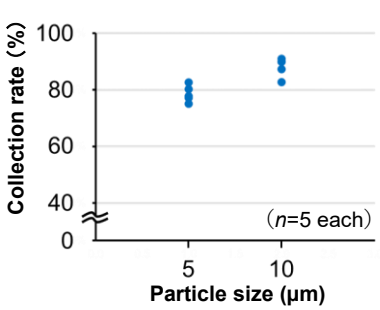
The SFPC is designed with four essential components: (1) funnel, (2) collecting section, (3) suction bottle, and (4) vacuum pump. Its modular design allows the collecting section to be easily replaced, enabling seamless selection among three different collection methods depending on the analytical needs. By employing vacuum filtration, the SFPC ensures fast and efficient collection of MPs from water samples, even for processing large volumes or samples containing large amounts of contaminants.



Specifications

Capacity	Funnel: 300 mL, Flask: 1000 mL
Processing speed (distilled water used)	(A) Collection cup method: approx. 180 mL / min (B) Filter paper (S) method: approx. 60 mL / min (C) Filter paper (L) method: approx. 2 L / min
Collectable particle size	(A), (B), or (C) method: Filter dependent (method (A): refer to the figure on the right)
Collection cup	Eco-Cup LHF (Bottom hole Φ1 mm, Deactivated stainless steel), Metal filter (1 µm opening, Stainless steel)
Standard accessories	Eco-Cup LHF for method (A), Metal filter, Metal filter fitting jig, Quartz fiber filter paper (S)(L), etc.
Vacuum pump	Oil-free vacuum pump
Power requirement	100 ~ 240 VAC, 50/60 Hz, 30 VA

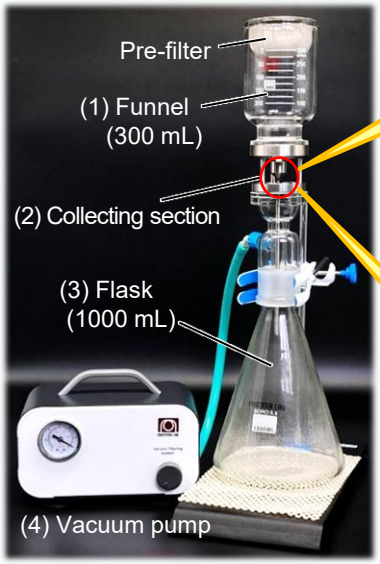
Example of collection rate using the collection cup method
(Sample: Model sample water containing 150 µg of polymer particles, 300 mL)



(5 µm: polypropylene, 10 µm: Polyethylene)

Three collection methods for your analysis need and sample water volume

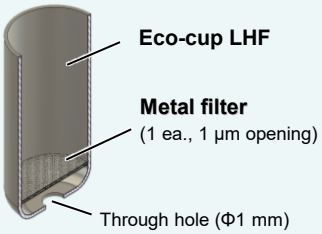
Sample water < 1 L



(A) Collecting-in-a-cup method

Installing a collection cup

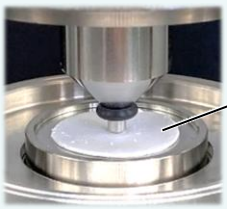
Cross section of a collection cup



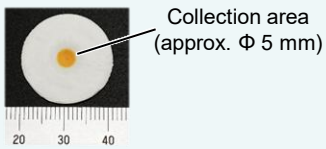
This is a quick and simple method that allows direct Py-GC/MS analysis of MPs collected in the collection cup. It uses a new type of collection cup: an Eco-Cup LHF (a pyrolysis sample cup having a 1 mm diameter through-hole at the bottom) into which a single metal filter is securely fixed. MPs are collected in the cup, dried, and analyzed by Py-GC/MS. The collection cup can be easily fabricated using the standard jig provided with the product.

(B) Filter paper (S) method

Installing a filter paper (S)

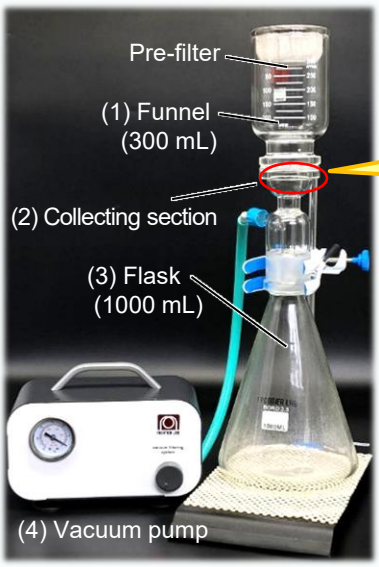


Particles collected



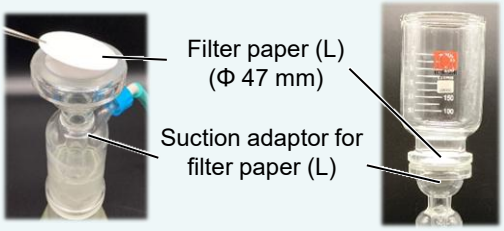
This method captures MPs at the center of a filter paper (S), approximately 5 mm in diameter. After collection, non-destructive analysis such as spectrometry can be performed. The collection area is then punched out with a puncher and put into a pyrolysis sample cup for Py-GC/MS analysis.

Sample water ≧ 1 L

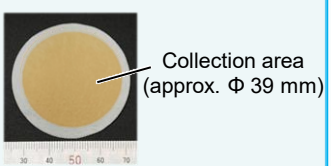


(C) Filter paper (L) method

Installing a filter paper (L)



Particles collected



This method collects MPs on a Φ 47 mm filter paper (L). Its large filtration area enables high processing speed while minimizing filter clogging. It is particularly effective when several liters of low-concentration sample water or samples containing high levels of contaminants. After collection, non-destructive analysis such as spectrometry can be performed. Then, a portion of the collection area can be punched out with a puncher. A few milligrams of the punched-out sample are placed into a pyrolysis sample cup for Py-GC/MS analysis.