

Microplastics Calibration Standard Ultra-Low set for MPs analysis using Py-GC/MS

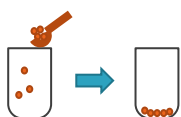
The Microplastics (MPs) Calibration Standard Ultra-Low set (**MPCS-UL**) is used to identify and quantify MPs using Py-GC/MS. It allows the user to easily create calibration curves for quantification of MPs. Eleven polymers, which are most widely produced globally, were selected, and trace amounts of the polymers ranging from a few tens of ng to a few µg were diluted and homogeneously mixed with powder diluent of silicon dioxide (SiO₂). The polymer concentrations are adjusted to approximately 1% of the MPCS (P/N: PY1-4940) and 10% of the MPCS-Low (P/N: PY1-4950). This product is suitable for quantitative analysis of trace MPs with F-Splitless pyrolysis using a Multi-Functional Splitless Sampler (MFS-2015E).

MPCS-UL information (11 polymers)

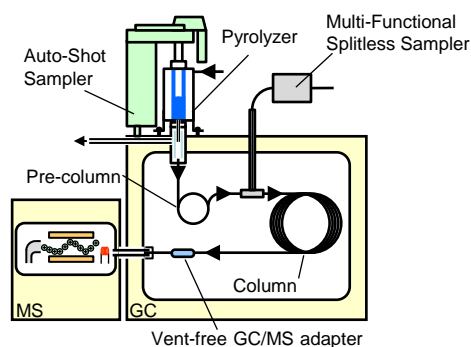
$\text{-(CH}_2\text{CH}_2\text{)}_n$ <p>Polyethylene (PE)</p>	<p>Polycarbonate (PC)</p>	$\text{-(CH}_2\text{CH(CN))}_1\text{-(CH}_2\text{CH=CHCH}_2\text{)}_m\text{-(CH}_2\text{CH(C}_6\text{H}_5\text{))}_n$ <p>Acrylonitrile-butadiene-styrene copolymer (ABS)</p>
$\text{-(CH}_2\text{CH(CH}_3\text{))}_n$ <p>Polypropylene (PP)</p>	<p>Poly(methyl methacrylate) (PMMA)</p>	$\text{-(CH}_2\text{CH=CHCH}_2\text{)}_m\text{-(CH}_2\text{CH(C}_6\text{H}_5\text{))}_n$ <p>Styrene-butadiene rubber (SBR)</p>
<p>Polystyrene (PS)</p>	<p>Polyethylene terephthalate (PET)</p>	<p>Polyamide-6,6 (Nylon-6,6, N66)</p>
$\text{-(CH}_2\text{CH(Cl))}_n$ <p>Poly(vinyl chloride) (PVC)</p>	<p>Polyamide-6 (Nylon-6, N6)</p>	

Analytical procedure

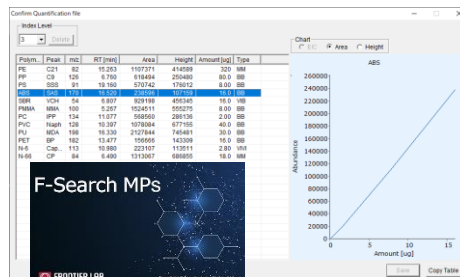
(1) Weigh 4 mg of **MPCS-UL** into the sample cups



(2) F-Splitless Py-GC/MS analysis



(3) Create a calibration curve using the specialized software F-Search MPs 2.1, and then analyze the real sample.



References

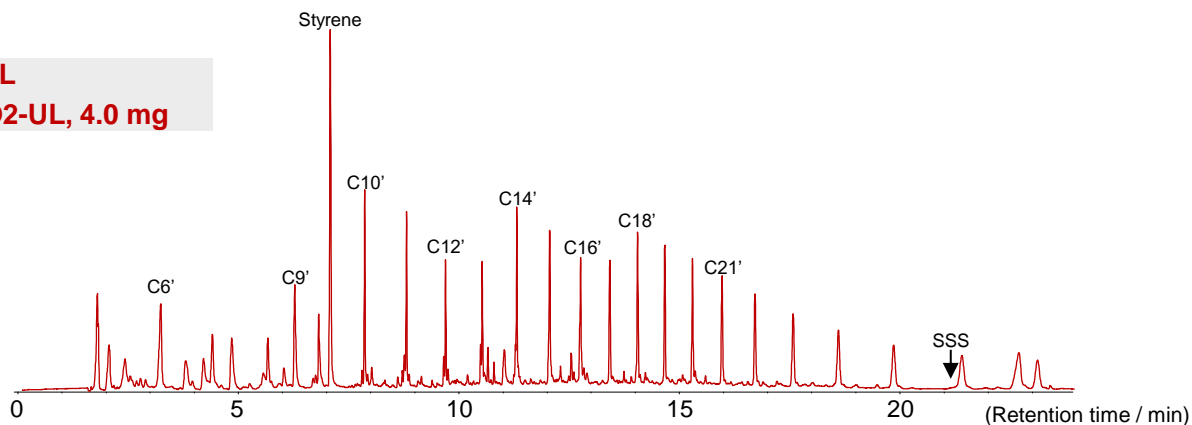
- 1) M. Matsueda *et al.*, *J. Anal. Appl. Pyrolysis* 154 (2021) 104993.
- 2) K. Matsui *et al.*, *J. Anal. Appl. Pyrolysis* 149 (2020) 104834.
- 3) K. Tei *et al.*, *J. Anal. Appl. Pyrolysis* 168 (2022) 105707.

Pyrogram of MPCS-UL

(EGA/PY-3030D, Furnace temp. 600 °C, **F-Splitless injection**)

Approximate content of each polymer in 4 mg of sample. These values are for reference only. Please check the test certificate provided with the product.
 PE: 1.6 µg, PP: 0.4 µg, PS: 0.08 µg, ABS: 0.16 µg, SBR: 0.16 µg, PMMA: 0.08 µg, PC: 0.04 µg, PVC: 0.4 µg, PET: 0.16 µg, N6: 0.05 µg, N66: 0.18 µg, diluent (SiO₂): ca. 3.99 mg

MPCS-UL
MPs-SiO₂-UL, 4.0 mg

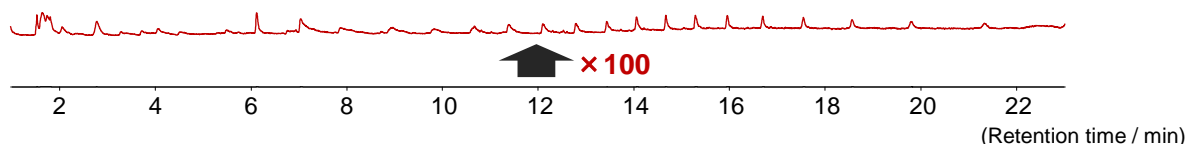


Comparison of MPCS in different concentrations by split injection

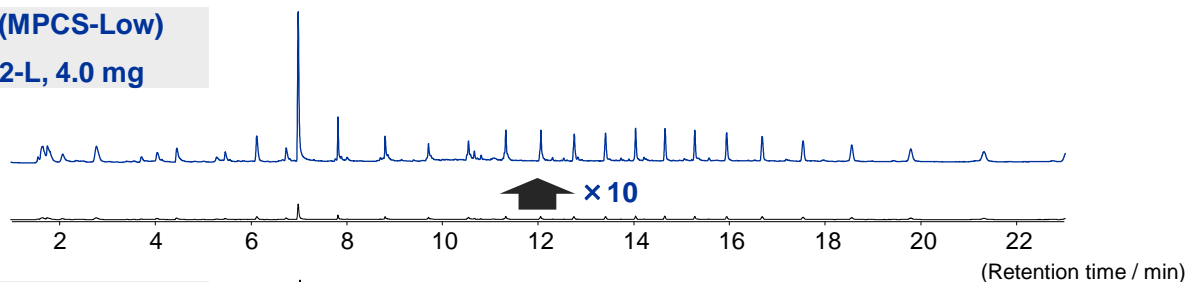
(EGA/PY-3030D, Furnace temp. 600 °C, **Split ratio: 1/50**)

MPCS-UL
MPs-SiO₂-UL, 4.0 mg

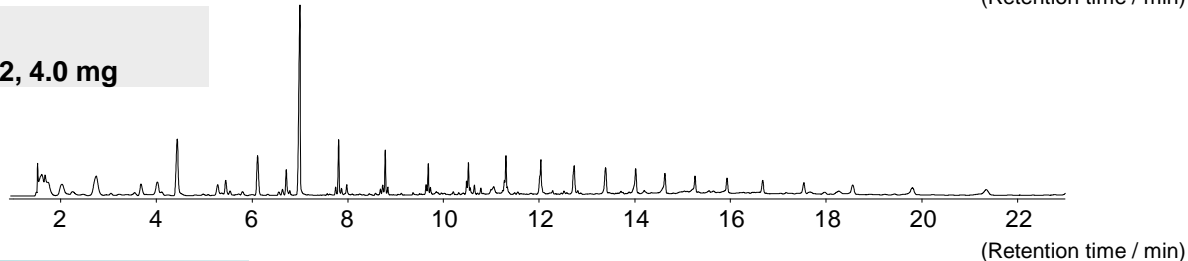
This product hardly observes any peaks under conventional split analysis conditions. It is highly recommended using Multi-Functional Splitless Sampler (MFS-2015E).



MPCS-L (MPCS-Low)
MPs-SiO₂-L, 4.0 mg



MPCS
MPs-SiO₂, 4.0 mg



Contents of package

Microplastics Calibration Standard Ultra-Low set (P/N: PY1-4960)

Product name	Amount (g)	Qty.	Description
MPs-SiO ₂ -UL	1	1	Ultra-low concentration MP calibration standards diluted and homogeneously mixed with SiO ₂ fine particles. This product is optimized for F-Splitless Py-GC/MS analysis using Multi-Functional Splitless Sampler MFS-2015E. This product can be used for reactive pyrolysis using TMAH* reagent
Diluent SiO ₂	3	1	SiO ₂
MPs-Quartz Wool	0.2	1	Use for preventing the scattering of powdered sample from a sample cup by putting some quartz wool on the sample in the cup
Micro Spatula 03	---	1	Sampling tool for small amount of solid sample

Note: No calcium carbonate (CaCO₃)-based product is available for MPCS-UL.

* Tetramethylammonium hydroxide



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