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SPME Arrow

High sensitivity and robustness in GC-MS Solid Phase Micro Extraction

ThermoFisher SCIENTIFIC

Solvent-free Sample Preparation with Solid Phase Micro Extraction (SPME)

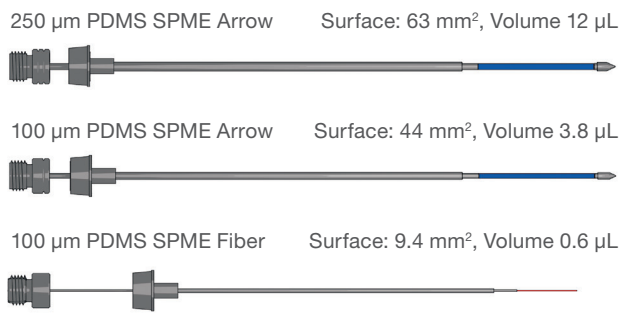
Solid Phase Micro Extraction is a solvent-free technique that couples sample extraction and enrichment in a single step.

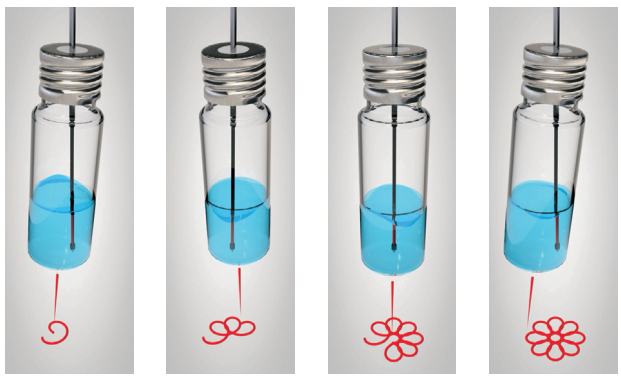
A thin fused-silica fiber coated by an organic phase extracts and concentrates the analytes by ab- or adsorption and desorption processes from liquid, solid and gaseous matrices. The fiber is successively thermally desorbed into a GC injector and the analytes are transferred to the analytical column.

Boost productivity with the optimized SPME Arrow design

The Thermo Scientific™ SPME Arrow provides optimized fiber geometry to achieve superior sensitivity, reduce the extraction time and improve laboratory throughput.

- **Higher sensitivity**—larger sorption volume achieves up to 10 times higher sensitivity compared to classic SPME fibers
- **Faster extraction**—larger surface for sorption allows the extraction of the same amount of analytes, but 2 times faster than classic SPME fibers
- **Improved robustness**—optimized fiber geometry and material increases robustness and reduces septa coring with the arrow needle shape
- **Full range of sorption materials**—available to fulfill requirements for all applications
- **Easy fiber identification**—fibers are color coded according to both the coating phase and the diameter which makes identification easy once installed
- **Powerful extraction technology**—the *Heatex Stirrer* module assures effective stirring through a cycloid shape mixing pattern. Rapid equilibration, constant stirring and accurate temperature control ensure optimal and accurate extraction efficiency. The cycloid stirring technology stirs only the bottom part of the vial which reduces the fiber stress and improves robustness and fiber lifetime.





Thermo Scientific TriPlus Robotic Sample Handling

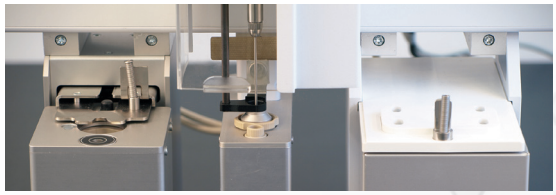
The Thermo Scientific™ TriPlus™ RSH™ Autosampler offers full automation through exceptional precision, flexibility and productivity in sample preparation.

The accurate automation of a multitude of traditionally manual tasks increases precision and reproducibility and enables unprecedented flexibility in GC and GC-MS sampling.

Scalable capabilities enable expanded GC and GC-MS application ranges and sample types supporting full, unattended 24/7 operation.

Solid Phase Micro Extraction workflow

Optimum performances in solid phase micro extraction are achieved through precise control of all steps: incubation, extraction, desorption/injection and fiber conditioning.



INCUBATION

Sample is pre-equilibrated in the *Incubator* module at constant temperature and agitation speed

EXTRACTION

Analytes are efficiently extracted through the cycloid movement of *Heatex Stirrer*

DESORPTION/ INJECTION

Fiber is thermally desorbed in the GC injector port

FIBER CLEAN UP

After desorption, the fiber is baked-out in the *Conditioning* module to prevent system contamination

OVERLAPPING CAPABILITY
Shortens the time between samples enhancing analysis throughput

SPME Arrow ADVANCED SAMPLE PREPARATION
Sample **on-fiber derivatization and internal standard addition** capabilities can be combined with the extraction step for enhanced performances and productivity

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Hit more applications with SPME Arrow

The SPME Arrow fibers combine the advantages of classical SPME fibers with the benefits of extraction techniques providing larger phase volumes as stir bar sorptive extraction (SBSE) improving fibers sensitivity and robustness and overcoming the limited automation of SBSE.

It can be successfully applied to environmental, food, aroma, clinical and forensic analysis to fulfill the sensitivity requirements for the detection of ultra-trace and trace analytes in simple, clean, dirty and complex matrices.

A wide fiber selection is available for detection of volatile and semi-volatile compounds with large range of boiling point and polarity.

Headspace, Direct Immersion and On-Site sampling capability can be used to easily extract and analyze solid, liquid and gas samples.

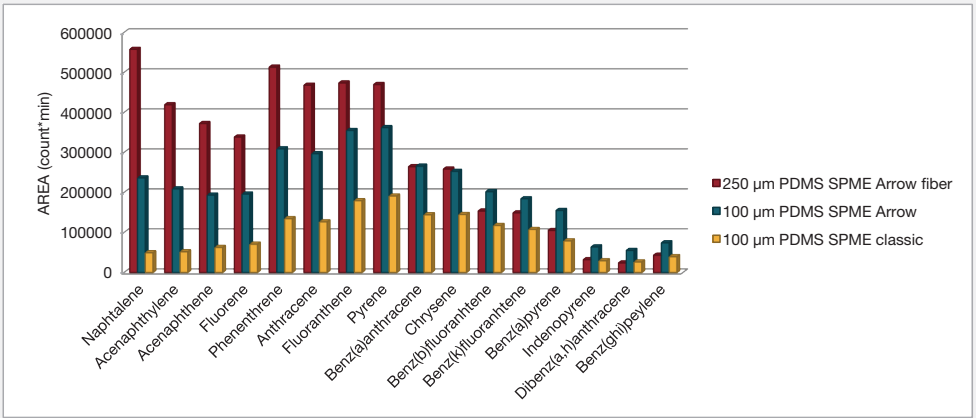
Key applications that can be approached with SPME are the characterization of aroma in wines, off-flavor in food products and packaging, as well as pesticides, phenols, chlorophenols, BTEX and PAHs in water and soil.

Increased extraction efficiency

SPME Arrow larger fiber surface and volume provide an increased extraction efficiency compared with classic SPME fiber in the same extraction time. Results obtained for classic SPME and SPME Arrow for 16 regulated PAHs in drinking water are shown below.

Powerful technology, better sensitivity

Unmatched detection limits can be achieved with SPME Arrow. Concentrations in the range between 0.1 and 1.0 ppt can be detected for 16 regulated PAHs under optimized conditions.



Extraction of 16 regulated PAHs with 100 µm PDMS SPME classic (yellow), 100 µm PDMS SPME Arrow (teal) and 250 µm PDMS SPME Arrow fiber (red) in Direct Immersion, 30 minutes

Find out more at **www.thermofisher.com/TriPlusRSH**

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