MARKES
international

Consumables and accessories

For GC sample extraction

2021

Consumables and accessories

Laboratory supplies for enhanced extraction and analysis of trace organic chemicals

Markes International is one of the world's leading providers of specialist GC sampling and sample introduction equipment and has been at the forefront of innovations in this field for over 20 years.

Our products automate and enhance measurement of volatile and semi-volatile organics from a wide range of challenging real-world solid, liquid and gas-phase samples. They support **sorbent-based sampling** (**active and passive**) and **thermal desorption** (TD) [*p.10*] for trace organic vapours, as well as **headspace** (HS) [*p.6*], **solid-phase microextraction** (SPME) [*p.3*] and **HiSorb™ high-capacity sorptive extraction** [*p.8*] for solid and liquid samples. These sampling techniques all benefit from being simple, easy to automate and compatible with most commercial GC platforms.

Building on Markes' expertise in TD instrumentation, the *new* **Centri® sample**

extraction and enrichment platform combines technical enhancements such as trapping and enrichment technology with HS, SPME, HiSorb and TD, generating a more comprehensive picture of a sample and its chemical components.

The portfolio of consumables and accessories presented in this catalogue is designed to enhance the performance of both traditional sample introduction techniques and the Centri platform. It presents a comprehensive range of routine and specialist supplies, all designed to extend laboratory capability, optimise reliability and deliver high-quality data.

Contact your regional distributor or one of our offices (details below).

Visit: www.markes.com/shop to find out more.

KEY APPLICATIONS

Aroma/flavour compounds in foods and beverages

Pollutants in soil and water

Biomarkers in clinical samples

Metabolites in biological samples

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Solid-phase microextraction (SPME)

Solid-phase microextraction (SPME) uses a small fiber coated with absorptive phase(s) to extract volatiles from samples in headspace or immersive modes. SPME extraction is dependent on the equilibrium between the sample matrix (either within a liquid or the headspace above a liquid or solid) and the absorptive phase. Analytes that become absorbed into the SPME phase are subsequently desorbed using a heated injector before transfer to the GC column, a process that can be fully automated and optimised using Centri.

The simple, solvent-free nature of SPME has led to its increased popularity across a range of application areas, particularly in food and beverage analysis, clinical studies and environmental analysis. Compared with headspace, SPME can offer improved selectivity and concentration capability, especially for less volatile species, resulting from the sampling capacity of the sorptive phase. A variety of sampling phases are available to extend the applicability of SPME over a range of target analytes.

SPME fibers, however, are fragile and immersive sampling must be done carefully and often manually. Under certain situations, automation can reduce the number of extractions possible from each fiber.

With its integrated cryogen-free focusing trap, Centri significantly extends and enhances SPME performance in the same way as it does for headspace. Centri's unique and innovative SPME–trap injection mode boosts sensitivity by improving peak shape and by allowing multiple sample enrichment steps prior to GC injection.

The following products address the main requirements for GC sample introduction using conventional SPME (manual and automated) and for SPME–trap mode on Centri.

Smart SPME fibers

Product code	Product description
S2-FIB-A-85/10-P1*	SPME fiber, Acrylate, 85 µm thickness, 10 mm length, grey, pk 1
S2-FIB-C-WR-95/10-P1*	SPME fiber, Carbon WR, 95 µm thickness,10 mm length, dark blue, pk 1
S2-FIB-P-100/10-P1*	SPME fiber, PDMS, 100 µm thickness, 10 mm length, red, pk 1
S2-FIB-P-30/10-P1*	SPME fiber, PDMS, 30 µm thickness, 10 mm length, gold, pk 1
S2-FIB-P-7/10-P1*	SPME fiber, PDMS, 7 µm thickness, 10 mm length, green, pk 1
S2-FIB-DVB-65/10-P1*	SPME fiber, DVB/PDMS, 65 µm thickness, 10 mm length, violet, pk 1
S2-FIB-DVB/C-WR-80/10-P1*	SPME fiber, DVB/Carbon WR/PDMS, 50/30µm thickness, 10 mm length, dark grey, pk 1
S2-FIB-SEL5-S1	SPME fibers, collection of 5: 10 mm length, thickness 7, 30 and 100 µm (PDMS), 85 µm (Acrylate), 95 µm (Carbon WR)
S2-FIB-SEL5-S2	SPME fibers, collection of 5: 10 mm length, thickness 100 µm (PDMS), 65 µm (DVB), 95 µm (Carbon WR), 85 µm (Acrylate), 80 µm (DVB/Carbon WR)

Smart SPME Arrows

Product code	Product description
S2-ARR1115-SEL5-S2	Collection of 5 smart SPME arrows 1.10 mm: 20 mm length, thickness 100 µm (PDMS), 120 µm (Carbon Wide Range/PDMS), 120 µm (DVB/PDMS), 100 µm (PDMS), 120 µm (DVB/Carbon Wide Range/PDMS)
S2-ARR11-A-100/20-P1*	Acrylate smart SPME arrow 1.10 mm, 100 µm thickness, 20 mm length, grey, pk 1
S2-ARR11-C-WR-120/20-P1*	Carbon Wide Range/PDMS smart SPME arrow 1.10 mm, 120 µm thickness, 20 mm length, light blue, pk 1
S2-ARR11-DVB/CWR120/20-P1*	DVB/Carbon Wide Range/PDMS smart SPME arrow 1.10 mm, 120 µm thickness, 20 mm length, dark grey, pk 1
S2-ARR11-DVB-120/20-P1*	DVB/PDMS smart SPME arrow 1.10 mm, 120 µm thickness, 20 mm length, violett, pk 1
S2-ARR11-P-100/20-P1*	PDMS smart SPME arrow 1.10 mm, 100 µm thickness, 20 mm length, red, pk 1
S2-ARR15-DVB/CWR120/20-P1*	DVB/Carbon Wide Range/PDMS smart SPME arrow 1.50 mm wide sleeve, 120 µm thickness, 20 mm length, dark grey, pk 1
S2-ARR15-DVB-120/20-P1*	DVB/PDMS smart SPME arrow 1.50 mm wide sleeve, 120 µm thickness, 20 mm length, violett, pk 1
S2-ARR15-P-100/20-P1*	PDMS smart SPME arrow 1.50 mm wide sleeve, 100 µm thickness, 20 mm length, red, pk 1
S2-ARR15-P-250/20-P1*	PDMS smart SPME arrow 1.50 mm wide sleeve, 250 µm thickness, 20 mm length, black, pk 1
S2-SARR15-C-WR-120/20-P1*	Carbon Wide Range/PDMS smart SPME arrow 1.50 mm wide sleeve, 120 µm thickness, 20 mm length, light blue, pk 1

To order SPME accessories, simply telephone or email.

Email: enquiries@markes.com

Web: www.markes.com

Telephone

UK: +44 (0)1443 230935
USA: +1 866-483-5684 (toll-free)
Germany: +49 (0)69 6681089-10
P.R. China: +86 21 5465 1216

*Other pack sizes available

Acrylate – Polyacrylate, Carbon WR – Carbon Wide Range, PDMS – Polydimethylsiloxane, DVB - Divinylbenzene

SPME tools

Product code	Product description
C-MIK-SPME	Manual injector kit, SPME

Vials and caps

Product code	Product description
C-VCC20	Headspace vial, 20 mL, crimp-top, clear, round-bottomed, pk 100
C-VCC10	Headspace vial, 10 mL, crimp-top, clear, round-bottomed, pk 100
C-HSVCCS	Cap with microcenter septum, for 10 mL/20 mL crimp-top vials, magnetic, bimetallic, pk 100
C-VSC20	Headspace vial, 20 mL, screw-top, clear, round-bottomed, pk 100
C-VSC10	Headspace vial, 10 mL, screw-top, clear, round-bottomed, pk 100
C-HSVSCS	Cap with microcenter septum, for 10 mL/20 mL screw-top vials, magnetic, pk 100

Vial tools

Product code	Product description
U-HSVDC	Vial decapper, for 10 mL/20 mL crimp-top vials (20 mm)
U-HSVCR	Vial crimping tool, for 10 mL/20 mL crimp-top vials (20 mm)

Agitation

Product code	Product description
U-HSAG-20	HiSorb Agitator, accommodates 16 vials (20 mL)
U-HSVB-20	Replacement vial block for Agitator
C-HSINS10-4	Agitator spacer for vials, 20 mL to 10 mL, pk 4
C-HSINS10-6	Agitator spacer for vials, 20 mL to 10 mL, pk 6

Required for use with Centri

Product code	Product description
U-LINER-SPME	Injector liner, SPME
U-SEP11	Septum, 11 mm (for headspace and SPME injector inlet on Centri), pk 50

Headspace and headspace–trap

Headspace (HS) has been widely used for quantitative evaluation of VOCs in solid and liquid samples for many years. Samples are placed into vials, sealed and incubated. Once equilibrium is reached, VOCs partition into the headspace at levels that are proportional to their concentration in the original liquid or solid sample. A precise aliquot of headspace vapour is then transferred/ injected directly into the GC (traditional methods) or *via* an electrically-cooled focusing trap (Centri) for enhanced performance.

Headspace remains popular with analysts due to the minimal sample preparation required, its ability to deal with a variety of difficult sample matrices and its excellent performance (particularly for very volatile compounds).

Common applications include:

- Blood/urine alcohol content
- Flavour/aroma of foods and beverages
- Residual solvents in packaging and pharmaceuticals
- Odour/taint analysis in water

Centri extends and improves traditional HS applications by incorporating the world's leading cryogen-free trap technology to refocus compounds of interest before GC injection. Using the focusing trap allows larger volumes of headspace vapour to be introduced and enhances peak shape thus optimising detection limits. It also enables interferences such as water to be selectively purged to vent before the start of each run. Another key advantage of Centri is that it allows multiple HS extractions to be combined into a single injection, resulting in optimum sample enrichment with detection limits approaching those only normally achieved using purge-and-trap.

The following products address the main requirements for performing both standard HS applications (manual and automated) and HS–trap sampling on Centri.

HiSorb Agitator

Syringes

Product code	Product description
C-HSSYR-1000	Headspace syringe, 1 mL maximum capacity
C-HSSYR-2500	Headspace syringe, 2.5 mL maximum capacity
C-HSSYR-5000	Headspace syringe, 5 mL maximum capacity

Vials and caps

Product code	Product description
C-VCC20	Headspace vial, 20 mL, crimp-top, clear, round-bottomed, pk 100
C-VCC10	Headspace vial, 10 mL, crimp-top, clear, round-bottomed, pk 100
C-HSVCCS	Cap with microcenter septum, for 10 mL/20 mL crimp-top vials, magnetic, bimetallic, pk 100
C-VSC20	Headspace vial, 20 mL, screw-top, clear, round-bottomed, pk 100
C-VSC10	Headspace vial, 10 mL, screw-top, clear, round-bottomed, pk 100
C-HSVSCS	Cap with microcenter septum, for 10 mL/20 mL screw-top vials, magnetic, metallic, pk 100

Contact us now if you'd like to order headspace supplies.

Vial tools

Product code	Product description
U-HSVDC	Vial decapper, for 10 mL/20 mL crimp-top vials (20 mm)
U-HSVCR	Vial crimping tool, for 10 mL/20 mL crimp-top vials (20 mm)

Agitation

Product code	Product description
U-HSAG-20	HiSorb Agitator, accommodates 16 vials (20 mL)
U-HSVB-20	Replacement vial block for Agitator
C-HSINS10-4	Agitator spacer for vials, 20 mL to 10 mL, pk 4
C-HSINS10-6	Agitator spacer for vials, 20 mL to 10 mL, pk 6

Required for use with Centri

Product code	Product description
U-LINER-HS	Injector liner, headspace, pk 1
U-SEP11	Septum, 11 mm (for headspace and SPME injector inlet on Centri), pk 50

Smart headspace syringes

Product code	Product description
S2-H1000-65-T-23-SP	Smart headspace syringe, 1 mL maximum capacity
S2-H2500-65-T-23-SP	Smart headspace syringe, 2.5 mL maximum capacity
S2-H5000-65-T-23-SP	Smart headspace syringe, 5 mL maximum capacity

HiSorb high-capacity sorptive extraction

HiSorb is an innovative and labour-saving extraction technology for the analysis of VOCs and SVOCs using immersive or headspace sampling modes. HiSorb probes use a high-capacity sorptive phase to selectively extract and concentrate a wide range of organic compounds, which are subsequently transferred/injected into the GC *via* thermal desorption (TD) technology.

Robust HiSorb probes provide significantly more capacity and flexibility than SPME. Overcoming the fragility concerns of SPME, they offer reliable immersive as well as headspace sampling, thus enabling direct extraction of target compounds from challenging liquid samples including solutions, emulsions and suspensions. The sampled HiSorb probes are convenient to handle during subsequent washing/drying procedures and are then desorbed using industry standard sorbent tubes in offline TD systems such as Markes' UNITY-xr™ or TD100-xr™. Alternatively, the entire HiSorb sampling, washing, desorption and GC introduction process can be completely automated utilising Centri.

The reusability of the probes, combined with solvent-free sample preparation, means that HiSorb has a lower cost per sample than other techniques such as liquid–liquid extraction and solid phase extraction.

Centri also allows multiple HiSorb probes to be used in overlap mode to maximise productivity and sample throughput.

The following products address the main requirements for performing both manual and automated HiSorb sampling.

HiSorb probes

Product code	Product description
H1-AXAAC	HiSorb probe, PDMS, inert, standard length, pk 6
H1-AXABC	HiSorb probe, PDMS, inert, short version, pk 6
H1-XXAAC	HiSorb probe, PDMS, stainless steel, standard length, pk 6
H1-XXABC	HiSorb probe, PDMS, stainless steel, short version, pk 6
H2-AXAAC	HiSorb probe, PDMS/CWR, inert, standard length, pk 6
H2-AXABC	HiSorb probe, PDMS/CWR, inert, short version, pk 6
H2-XXAAC	HiSorb probe, PDMS/CWR, stainless steel, standard length, pk 6
H2-XXABC	HiSorb probe, PDMS/CWR, stainless steel, short version, pk 6
H3-AXAAC	HiSorb probe, PDMS/DVB, inert, standard length, pk 6
H3-AXABC	HiSorb probe, PDMS/DVB, inert, short version, pk 6
H3-XXAAC	HiSorb probe, PDMS/DVB, stainless steel, standard length, pk 6
H3-XXABC	HiSorb probe, PDMS/DVB, stainless steel, short version, pk 6
H4-AXAAC	HiSorb probe, DVB/CWR/PDMS, inert, standard length, pk 6
H4-AXABC	HiSorb probe, DVB/CWR/PDMS, inert, short version, pk 6
H4-XXAAC	HiSorb probe, DVB/CWR/PDMS, stainless steel, standard length, pk 6
H4-XXABC	HiSorb probe, DVB/CWR/PDMS, stainless steel, short version, pk 6

Manual HiSorb tools

Product code	Product description
C-HSPH	HiSorb handle, for manual probe extraction
C-HSPVLP-6	HiSorb septum plug, pk 6

Vials and caps

Product code	Product description
C-VCC20	Headspace vial, 20 mL, crimp-top, clear, round-bottomed, pk 100
C-VCC10	Headspace vial, 10 mL, crimp-top, clear, round-bottomed, pk 100
C-HSPCCS	Cap with HiSorb septum, for 10 mL/20 mL crimp-top vials, magnetic, pk 100

Vial tools

Product code	Product description
U-HSVDC	Vial decapper, for 10 mL/20 mL crimp-top vials (20 mm)
U-HSVCR	Vial crimping tool, for 10 mL/20 mL crimp-top vials (20 mm)

Agitation

Product code	Product description
U-HSAG-20	HiSorb Agitator, accommodates 16 vials (20 mL)
U-HSVB-20	Replacement vial block for Agitator
C-HSINS10-4	Agitator spacer for vials, 20 mL to 10 mL, pk 4
C-HSINS10-6	Agitator spacer for vials, 20 mL to 10 mL, pk 6

TD analysis*

Product code	Product description
C0-AXXX-0000	Empty stainless steel tube, pk 10
C0-CXXX-0000	Empty inert-coated stainless steel tube, pk 10
C-DL010	DiffLok cap, stainless steel, ¼″, pk 10
C-DL100	DiffLok cap, stainless steel, ¼″, pk 100
C-DLS10	DiffLok cap, inert, ¼″, pk 10
C-DLP10	DiffLok caps (one stainless steel, one inert), ¼″, pk 10 pairs
C-AC020	Short-term storage cap, aluminium, ¼″, pk 20
C-AC200	Short-term storage cap, aluminium, ¼″, pk 200

*Not required if using Centri automated sample preparation

Starter kits

Product code	Product description
C-HSPKIT-01	HiSorb Starter Kit (PDMS) (short, inert probes)
C-HSPKIT-02	HiSorb Starter Kit (PDMS/CWR) (short, inert probes)
C-HSPKIT-03	HiSorb Starter Kit (PDMS/DVB) (short, inert probes)
C-HSPKIT-04	HiSorb Starter Kit (DVB/CWR/PDMS) (short, inert probes)

Required for use with Centri

Product code	Product description
U-LINER-HISORB	Injector liner, HiSorb
U-COV201	O-Ring, size 201, pk 10 (for HiSorb injector and HiSorb storage)
C-HH-6	HiSorb handle, for use with Centri, pk 6
C-HSPVLP-20	HiSorb septum plug, pk 20

Centri sample extraction and enrichment platform

Centri combines sample extraction, enrichment and introduction into a versatile new form of GC–MS autosampler featuring a range of different modules and sampling modes:

- **Headspace and headspace–trap**
- **SPME and SPME–trap**
- **HiSorb high-capacity sorptive extraction**
- **Tube-based thermal desorption (using tube module)**

Designed for compatibility with all major brands of GC–MS, Centri offers research and production labs a high level of automation flexibility and analytical performance, delivering uncompromised and method-compliant analysis of ppt to percent level VOCs/SVOCs in liquids, solids and gases.

Underpinning Centri's exceptional performance is a state-of-the-art, cryogen-free focusing trap. This delivers significantly improved detection limits, relative to conventional methods, and allows unwanted interferences, such as water, to be purged to vent before the run.

Other key advantages offered by Centri include automated immersive sampling with overlap mode (when used with HiSorb) and quantitative sample re-collection for repeat analysis or archiving.

The following products, together with the vials, syringes and fibers commonly used in the various injection modes, ensure optimum performance of Centri across a range of application areas and sampling modes.

For a wider range of products for use with Centri in TD mode, please refer to Markes' Thermal Desorption tubes, Accessories & Spares catalogue.

Injector liners and seals

Product code	Product description
U-SEP11	Septum, 11 mm (for headspace and SPME injector inlet on Centri), pk 50
U-COV201	O-Ring, size 201 (for HiSorb injector and HiSorb storage), pk 10
U-LINER-HS	Injector liner, headspace
U-LINER-SPME	Injector liner, SPME
U-LINER-HISORB	Injector liner, HiSorb
U-COV108-L	O-Ring, brown, low-temperature (upper liner seal), pk 10
U-COV108-H	O-Ring, black, high-temperature (lower liner seal), pk 1

Vial tools

Product code	Product description
U-HSVDC	Vial decapper, for 10 mL/20 mL crimp-top vials (20 mm)
U-HSVCR	Vial crimping tool, for 10 mL/20 mL crimp-top vials (20 mm)

Racks

Product code	Product description
U-CENTRI-R15	Rack, for 10 mL/20 mL vials, accommodates 15 vials
U-CENTRI-R60	Rack, for 10 mL/20 mL vials, accommodates 60 vials
U-CENTRI-RVLP	Rack, for HiSorb septum plug, accommodates 20 plugs

Focusing traps

Product code	Product description
U-T1HBL-2S	Focusing trap, 'High-boilers'
U-T2GPH-2S	Focusing trap, 'General-purpose hydrophobic'
U-T4WMT-2S	Focusing trap, 'Water management'
U-T6SUL-2S	Focusing trap, 'Sulfur/labile'
U-T9TNX-2S	Focusing trap, Tenax® TA
U-T11GPC-2S	Focusing trap, 'General-purpose carbon'
U-T12ME-2S	Focusing trap, 'Material emissions'
U-T19PAH-2S	Focusing trap, 'PAH'

Tube module accessories

Product code	Product description
C-DL010	DiffLok cap, stainless steel, ¼", pk 10
C-DL100	DiffLok cap, stainless steel, ¼", pk 100
C-DLS10	DiffLok cap, inert, ¼", pk 10
C-DLP10	DiffLok caps (one stainless steel, one inert), ¼", pk 10 pairs
U-CENKIT	Centri booster pack (DiffLok caps and O-rings)

Centri sample extraction and enrichment platform

Starter kits

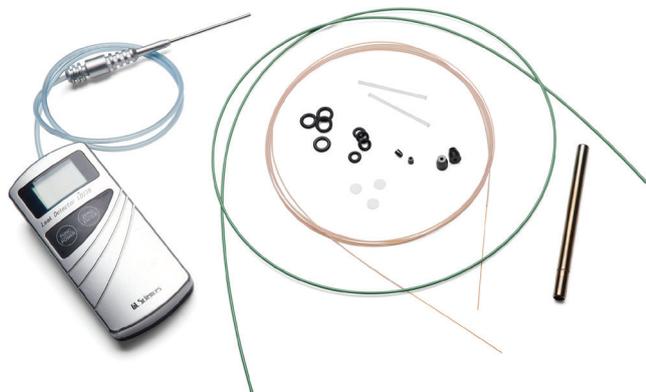| Product code	Product description
C-TDKIT-01	Essential TD starter kit
C-TAGKT	Essential TubeTAG starter kit (for stainless steel tubes)
C-KITDD-2S	Direct desorption starter kit

System calibration – for TD mode

Product code	Product description
C-CSLR	Calibration Solution Loading Rig™ (CSLR)™
C-SPTA	Septum, 9.5 mm (for CSLR), pk 10
C-SYL00-1UL	Syringe, 1 µL, plunger-in-needle with repeating adaptor, needle length 50 mm, 0.63 mm o.d.
C-SYL00-5UL	Syringe, 5 µL, plunger-in-barrel fixed needle, needle length 50 mm, 0.47 mm o.d.
C1-AXXX-5003	Tenax TA, stainless steel tube, pk 10
C1-AAXX-5003	Tenax TA, stainless steel tube, conditioned/capped, pk 10
C-CHK10	Check-standard (BTX, isobornyl methacrylate (IBMA) and dioctyl phthalate), 90 ng/µL (nominal), Tenax TA, pk 10

Product code	Product description
C-CHK10-ME	Check-standard (material emissions), 100 ng per tube (nominal), Tenax TA, pk 10
C-BTX100-10	Certified reference standard (CRS) tubes (BTX), 100 ng, pk 10
C-TO17100-10	Certified reference standard (CRS) tubes (TO-17 mix), 100 ng, pk 10
C-GS14A-1PPM	Standard, gas cylinder, TO-14A IS/tuning mix, 1 ppm
C-GSREG-101	Regulator, high-purity VOC, 0–100 psi outlet, ⅛″ tube compression connection
U-FV003	Ferrule, ⅛″ × ¹⁄₁₆″ graphite/vespel, pk 10 (to connect standard gas cylinder with ⅛″ outlet to Centri)
U-FV009	Ferrule, ¼″ × ¹⁄₁₆″ graphite/vespel, pk 10 (to connect standard gas cylinder to Centri)
SERZ-0412I	Inert-coated tubing, ¹⁄₁₆″ o.d. × 0.040″ i.d. (to connect standard gas cylinder to Centri)

To order any starter kits, simply telephone or send an email.

System maintenance

Product code	Product description
C-HLD	Helium leak detector with USB charger
C-FLMTR	Digital flowmeter
U-COV10	O-Ring, size 010, pk 10 (for split tube, DiffLok caps and tube module)
U-COV07	O-Ring, size 007, pk 10 (for focusing trap)
U-COV06	O-Ring, size 006, pk 10 (for heated valve)
C-QSC10	Quick-fit capillary connectors, pk 10 (connects transfer line to column)
SERUTE-5099	Fused silica transfer line insert (0.25 mm i.d.) and PTFE sleeve, 2 m
U-FV001	Ferrule, $\frac{1}{16}$" x 0.4 mm, Graphite/Vespel, pk 10
SERUTD-5065	Split filter tube, stainless steel, 3½", packed with charcoal
U-CENTRI-WMKIT	Wash module vial, 10 mL, with snap-cap and seal, pk 10 (for syringe-based sampling)
U-CENTRI-WMSCS	Replacement snap-cap and seal for wash module, pk 10
U-INJCAP01	Replacement injector cap, HS/SPME
U-INJCAP02	Replacement injector cap, HiSorb
SERZ-1056	Filter bubbler/sparge filter, stainless steel, ⅛" tube, for use with water inlet of Centri wash station

Talk to Markes International's specialists to get support based on your application needs.

Mode selection

Use the table to check compatibility of sampling technique and analytical approach with sample type.
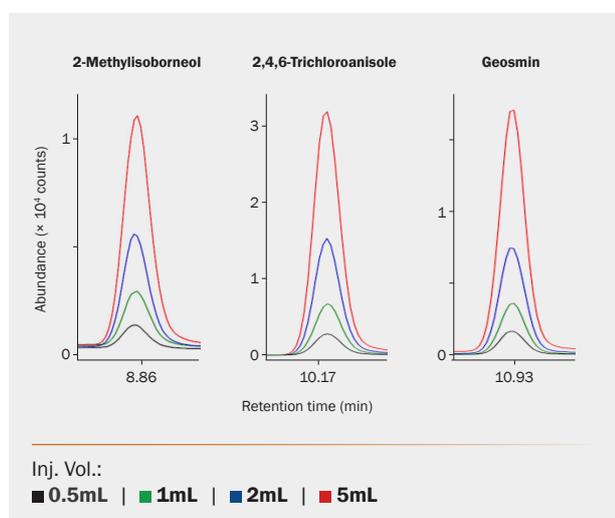
Sample type: ☁ Gas 💧 Liquid ⬢ Solid & liquid

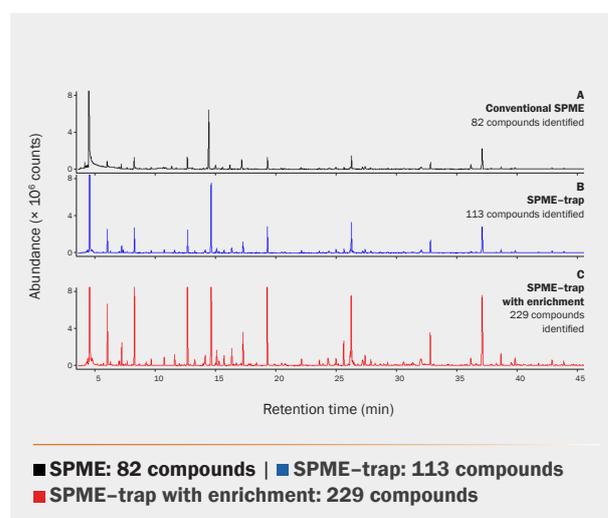| Sampling technique	ANALYTICAL APPROACH		
	Direct to GC	Thermal desorption	Centri® multi-mode sampling
Active sampling		☁ Gas	☁ Gas
Direct desorption		⬢ Solid & liquid	⬢ Solid & liquid
Dynamic headspace (e.g. microchamber)		⬢ Solid & liquid	⬢ Solid & liquid
Headspace	⬢ Solid & liquid		⬢ Solid & liquid
Headspace–trap			⬢ Solid & liquid
Passive sampling		☁ Gas	☁ Gas
Sorptive extraction (headspace)			⬢ Solid & liquid
High-capacity sorptive extraction (immersive)		💧 Liquid	💧 Liquid
SPME	⬢ Solid & liquid		⬢ Solid & liquid
SPME–trap			⬢ Solid & liquid
Whole air and gas sampling		☁ Gas	

The benefits of using a trap

Selected modes illustrated in the table incorporate the use of a focusing trap after sample collection/extraction. This enrichment step introduces several advantages that can be used to complement manual or single-step approaches, such as HS and SPME, including:

- Sharpening or focusing of chromatographic peaks to improve detection limits.

- Use of large (5 mL) HS volumes to maximise analyte masses and boost sensitivity. Multi-stage enrichment can also be applied.

- Ability to manage interferences such as water and solvent for improved detection of target compounds.

- Facilitates quantitative sample re-collection for archiving or repeat analysis.

Inj. Vol.:
■ 0.5mL | ■ 1mL | ■ 2mL | ■ 5mL

Headspace analysis:
Odorants (500 ppt) in 10 mL water, demonstrating the effect of injection volume on peak shape. Use of the focusing trap does not compromise peak symmetry but provides an incremental gain in sensitivity.

■ SPME: 82 compounds | ■ SPME–trap: 113 compounds
■ SPME–trap with enrichment: 229 compounds

Analysis of tea sample using a variety of SPME approaches, demonstrating how use of a focusing trap increases the number of compounds detected. Multi-step enrichment results in detection of 147 extra compounds over traditional SPME.

Trademarks

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