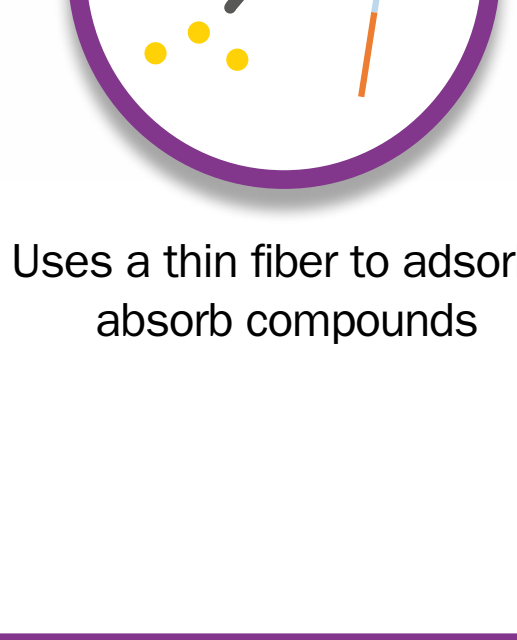
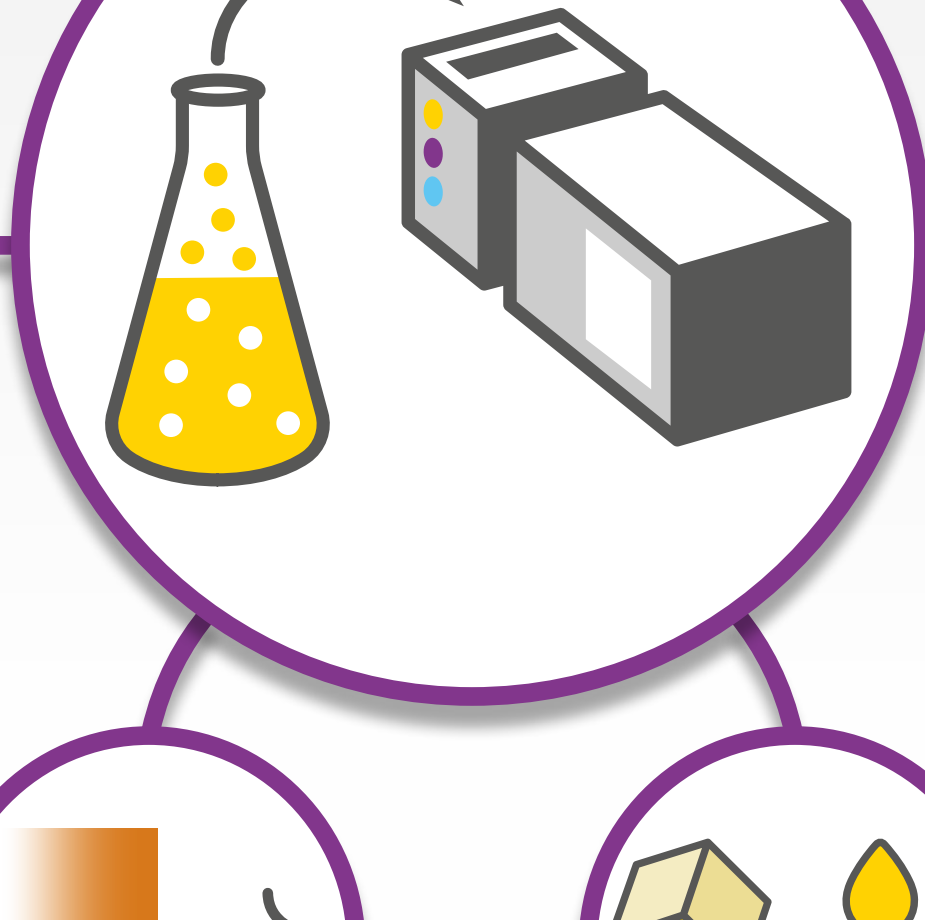


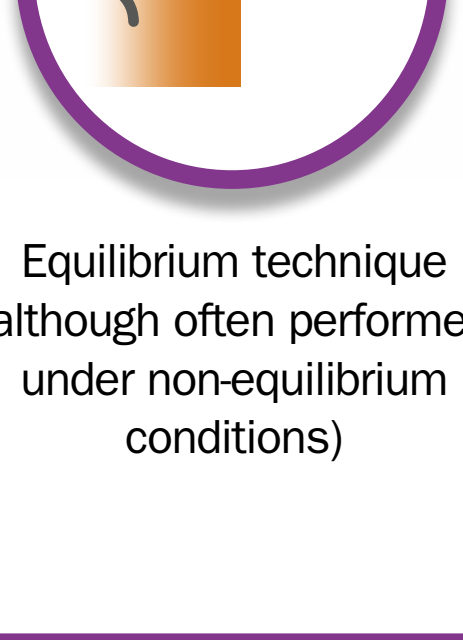
INTRODUCTION TO SPME AND SPME-TRAP

WHAT IS IT?

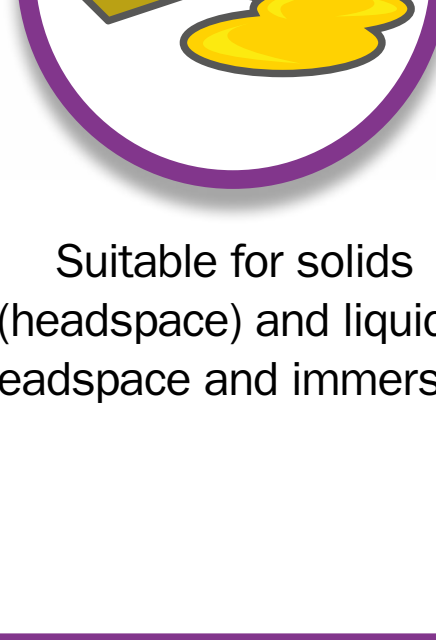
Solid-phase microextraction (SPME) is a technique for getting VOCs and SVOCs from a sample into a GC-MS.



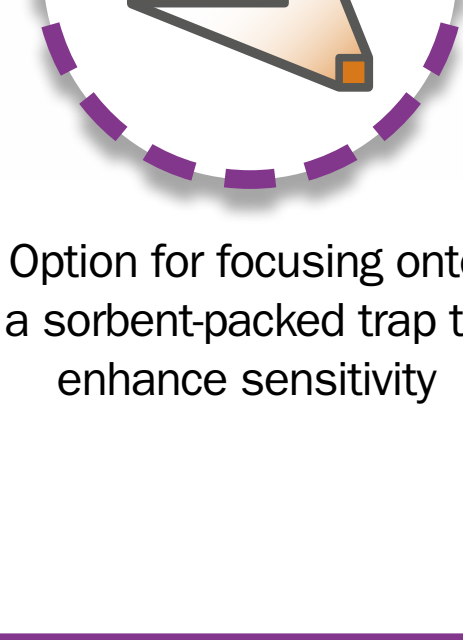
Uses a thin fiber to adsorb/absorb compounds



Equilibrium technique (although often performed under non-equilibrium conditions)



Suitable for solids (headspace) and liquids (headspace and immersive)



Option for focusing onto a sorbent-packed trap to enhance sensitivity

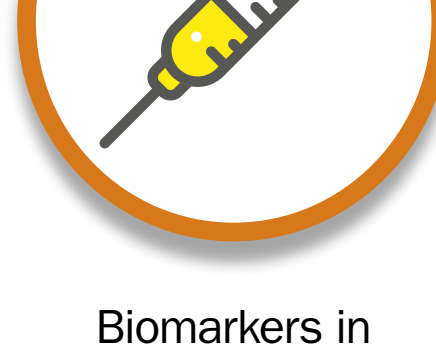
KEY APPLICATIONS



Aroma/flavour compounds in food



Pollutants in soil and water



Biomarkers in clinical samples



Odorants in drinking water

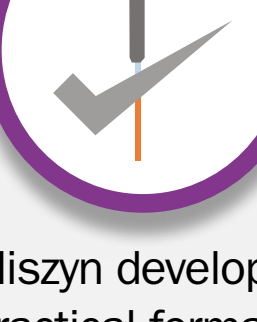
HISTORY

1987



Professor Janusz Pawliszyn reports desorption of analytes from silica fiber

1990



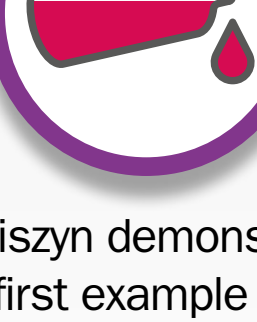
Pawliszyn develops first practical format of SPME

1993



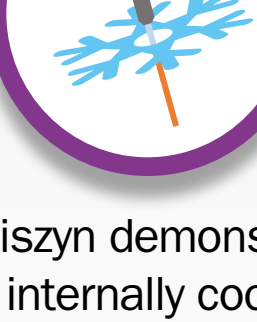
Launch of first commercially available SPME-GC system (Supelco)

1997



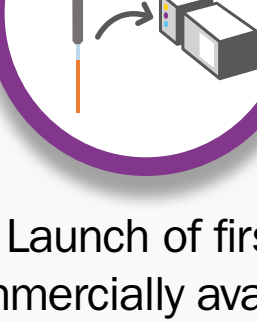
Pawliszyn demonstrates first example of derivatisation SPME

1995



Pawliszyn demonstrates use of internally cooled fiber for the first time

1993



Launch of first commercially available SPME-GC autosampler (Model 8200™, Varian)

1998



Launch of more robust polymer-coated SPME fibers (Stableflex™, Supelco)

1999



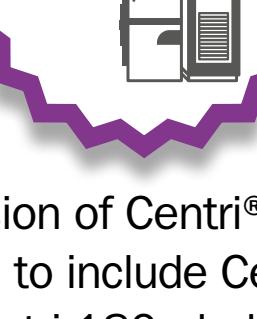
Launch of cross-platform autosampler for SPME (CTC Analytics)

2004



Launch of superelastic metal-core fibers (Supelco)

2023



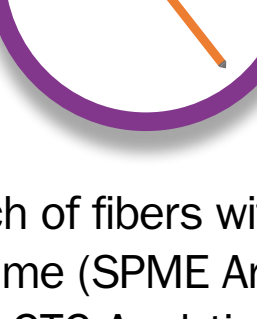
Expansion of Centri® product series to include Centri 90 and Centri 180, dedicated to high-sensitivity, high throughput routine analysis

2018



Launch of automated system with capability for SPME and SPME-trap, TD, headspace and high-capacity sorptive extraction (Centri 360, Markes International)

2015

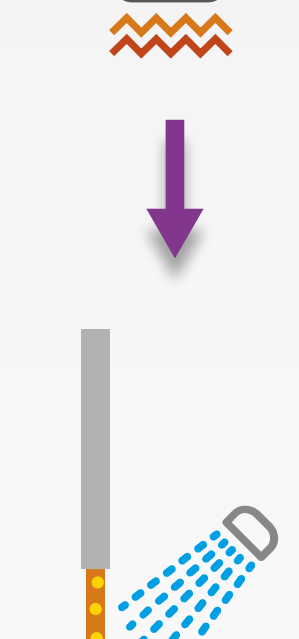


Launch of fibers with larger volume (SPME Arrow™, CTC Analytics)

TYPICAL WORKFLOW

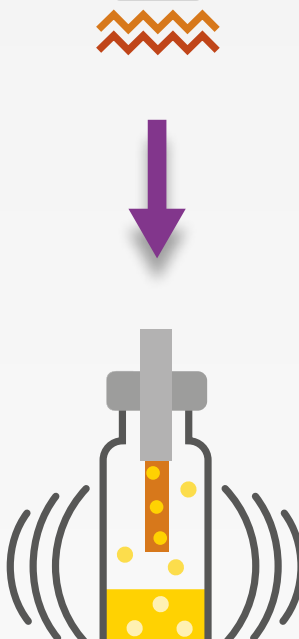
Sample added to vial

Immersive



Immerse fiber in liquid and agitate to aid equilibration

Headspace



Heat/agitate to aid equilibration

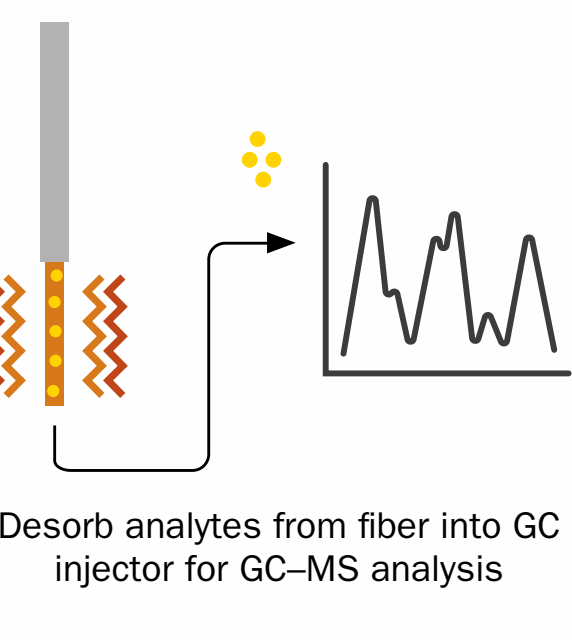
Wash fiber to remove excess matrix (optional)



Expose fiber to headspace

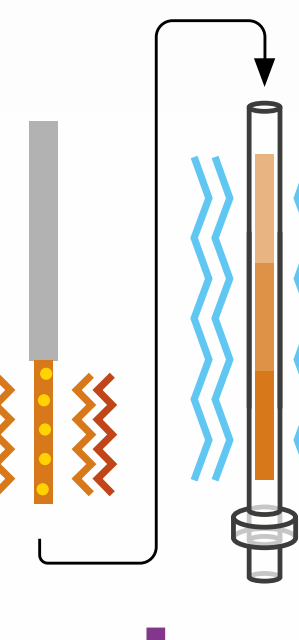


GC



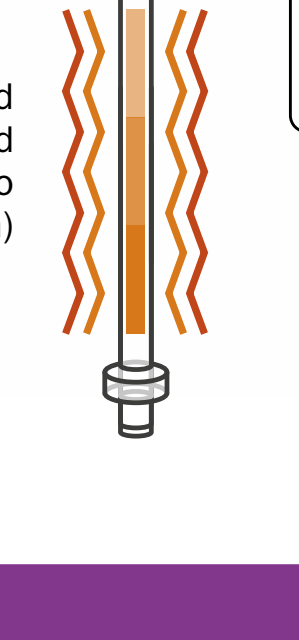
Desorb analytes from fiber into GC injector for GC-MS analysis

Trap then GC



Desorb analytes from fiber into sorbent-packed focusing trap

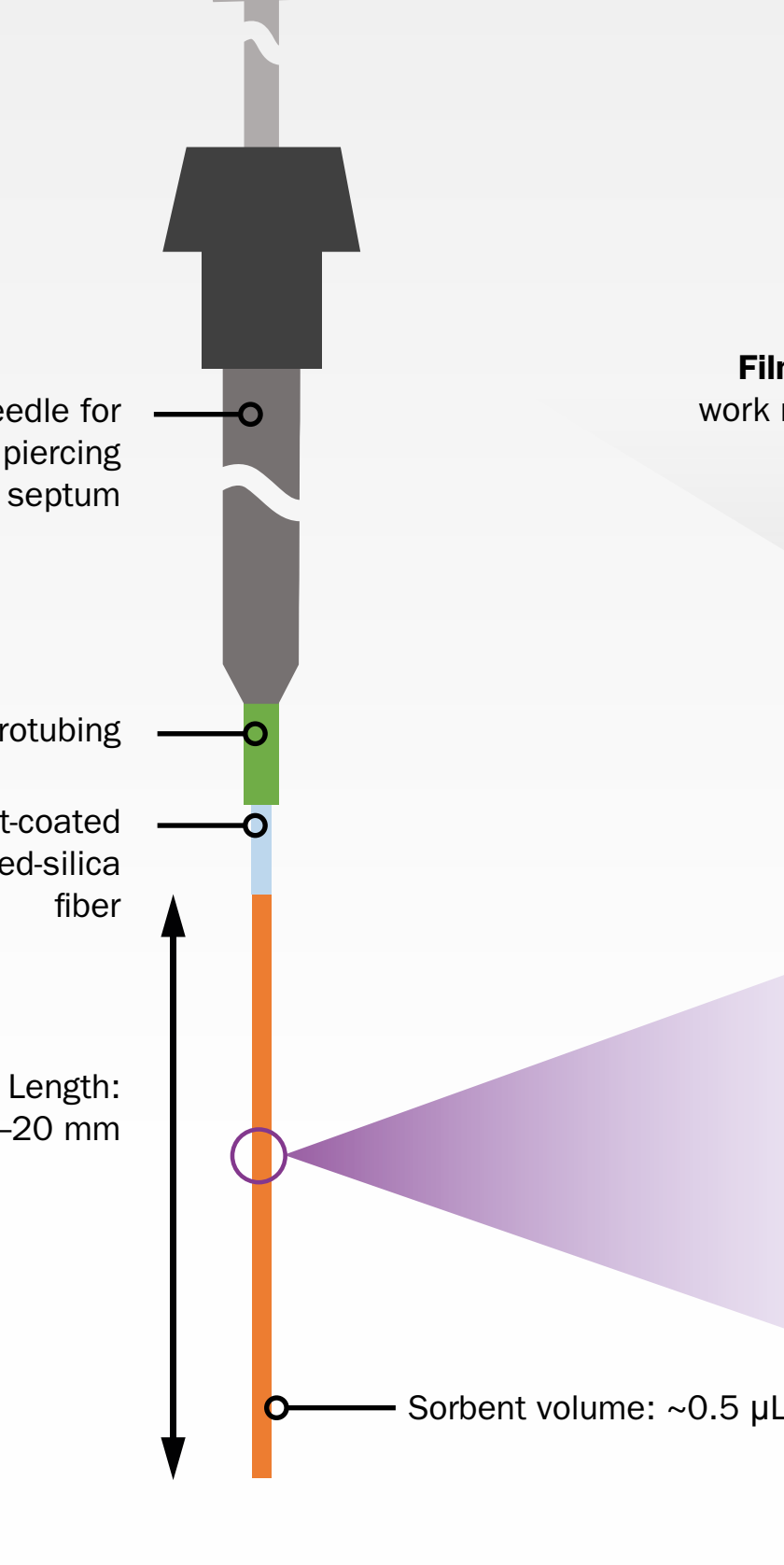
Preconcentrated analytes desorbed from focusing trap into GC-MS (backflush)



Narrow analyte band means better peak resolution

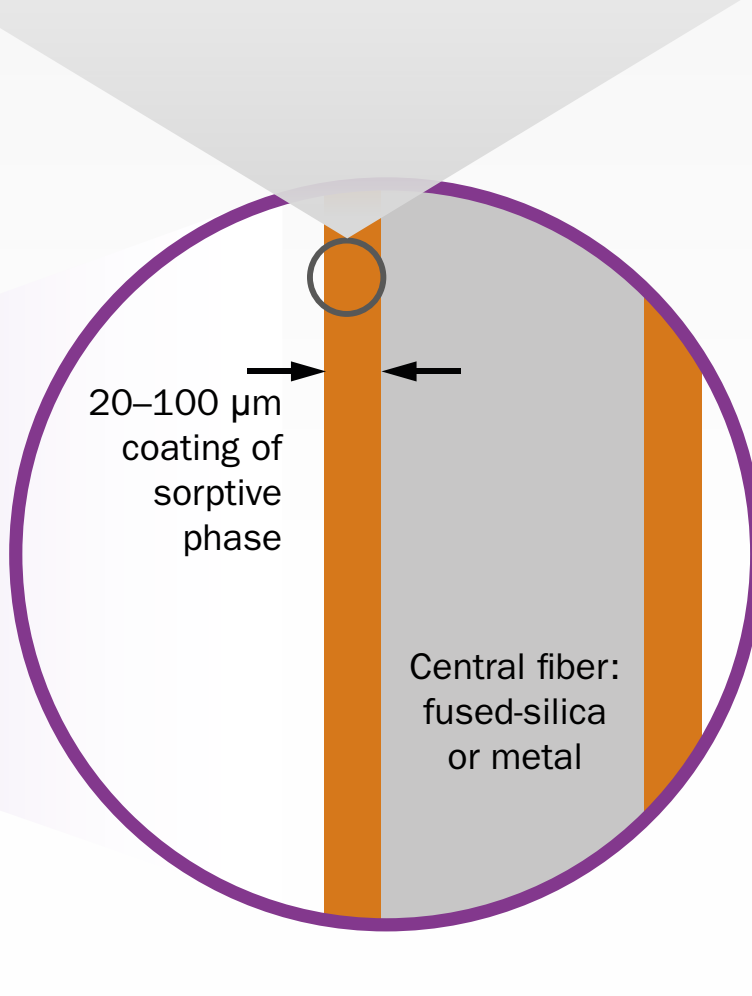
HOW SPME SAMPLING WORKS

Essential features



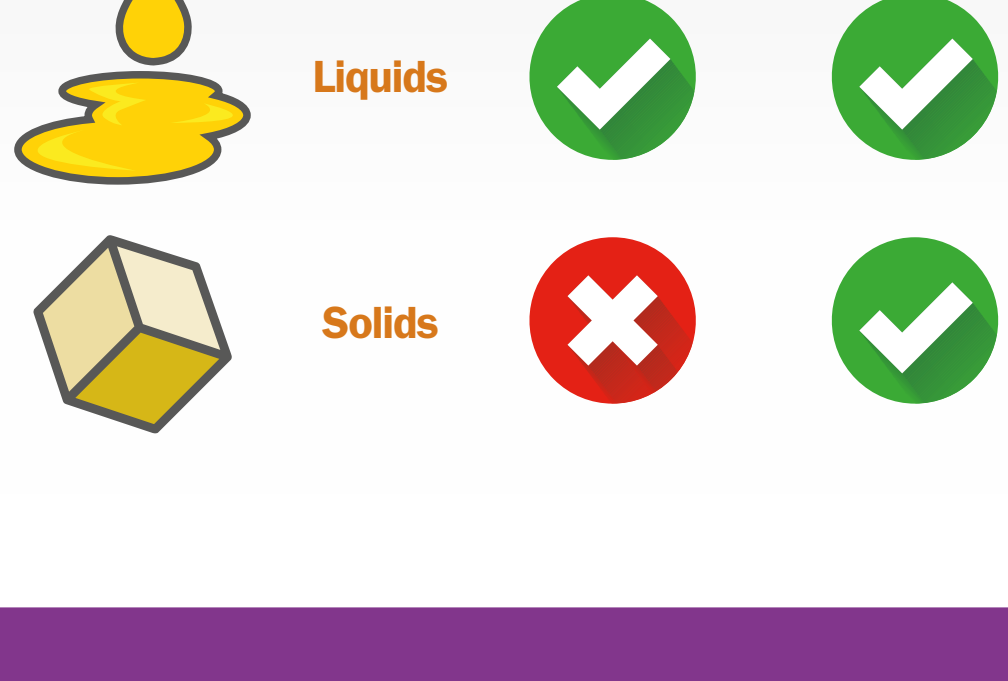
Films of 'liquid-like' polymers work mostly by absorption, and are always single-phase.

Solid coatings work mostly by adsorption, and can be single-phase or multi-phase.



WHAT CAN SPME BE USED FOR?

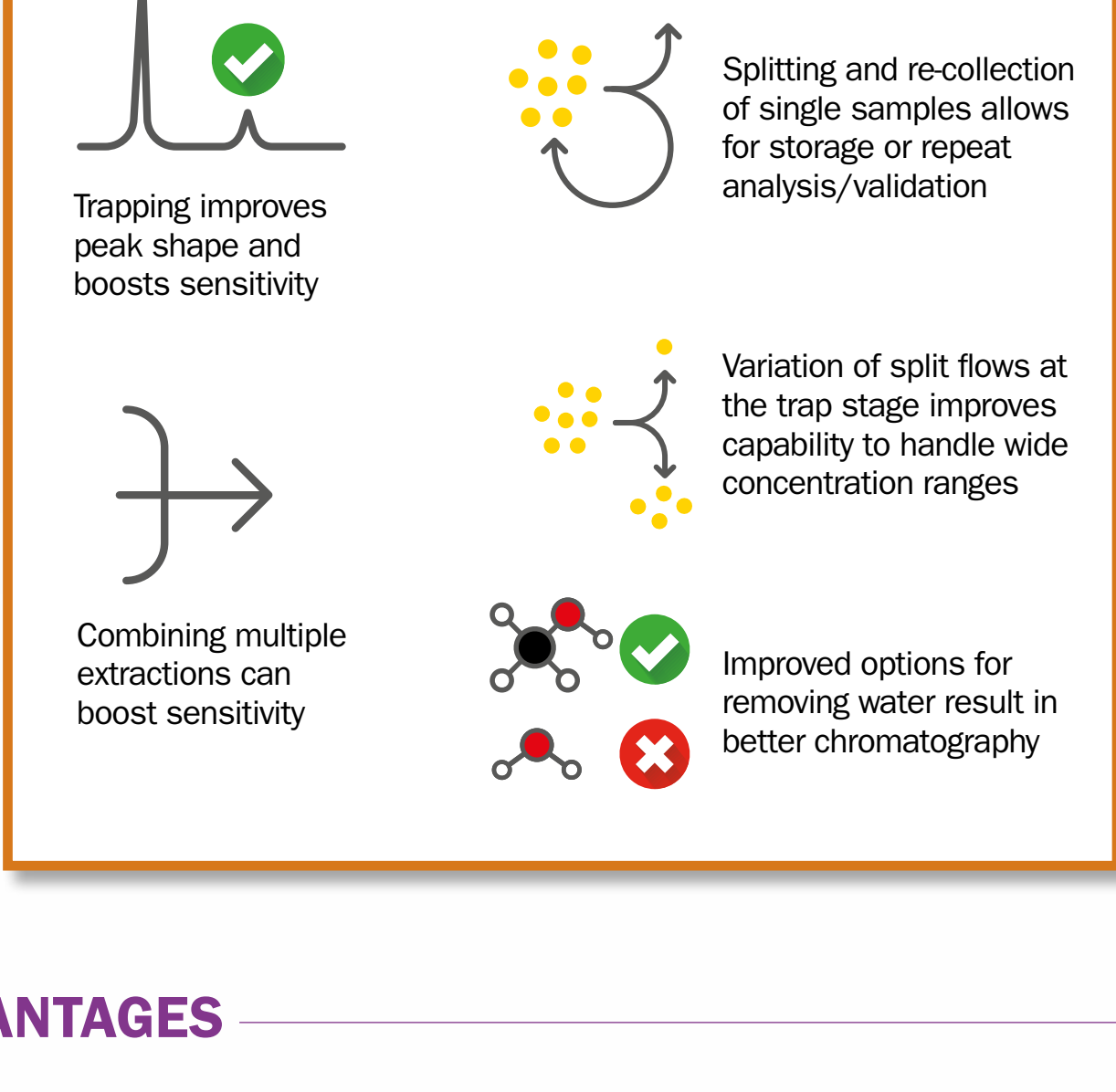
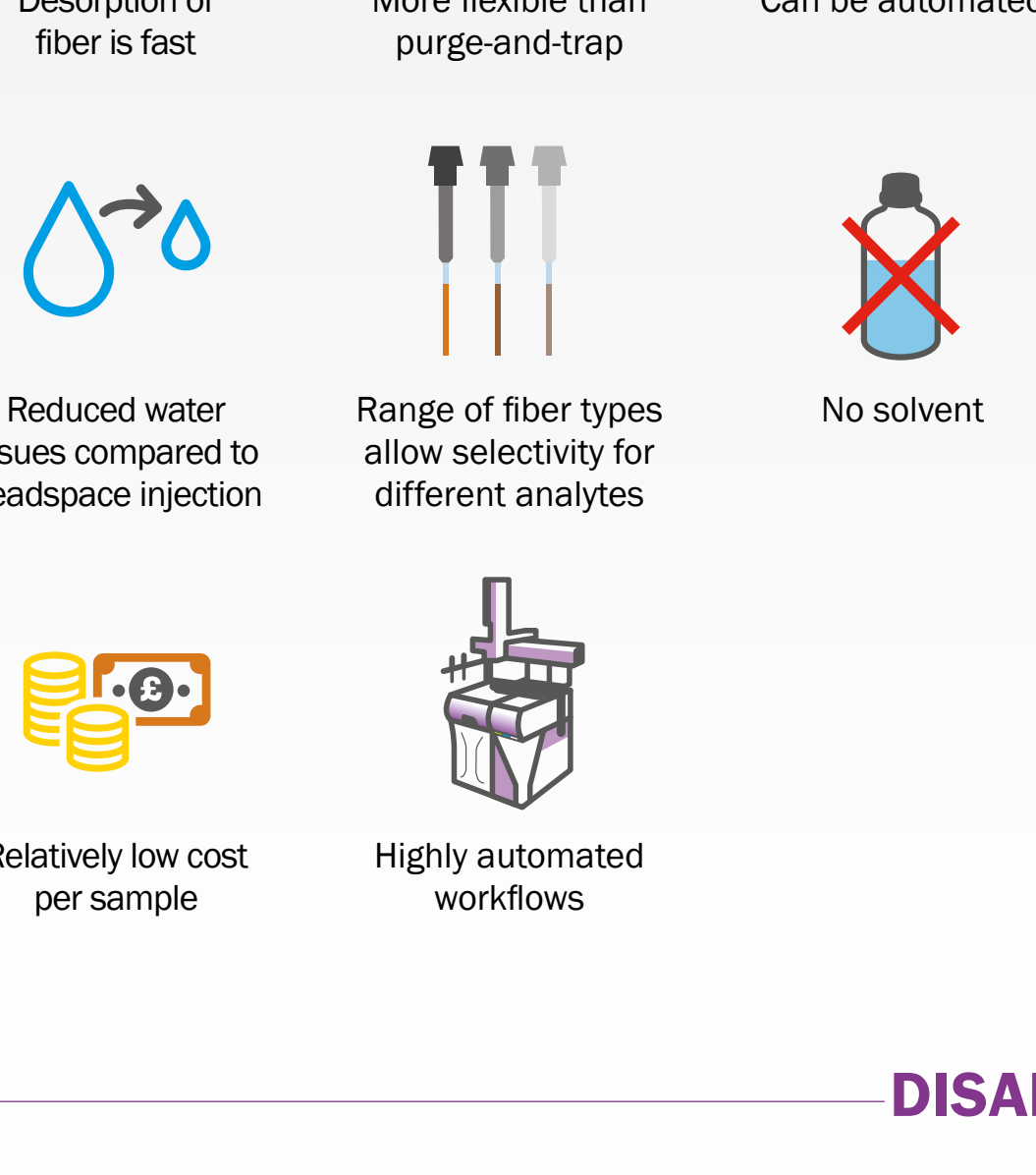
What types of samples are compatible?



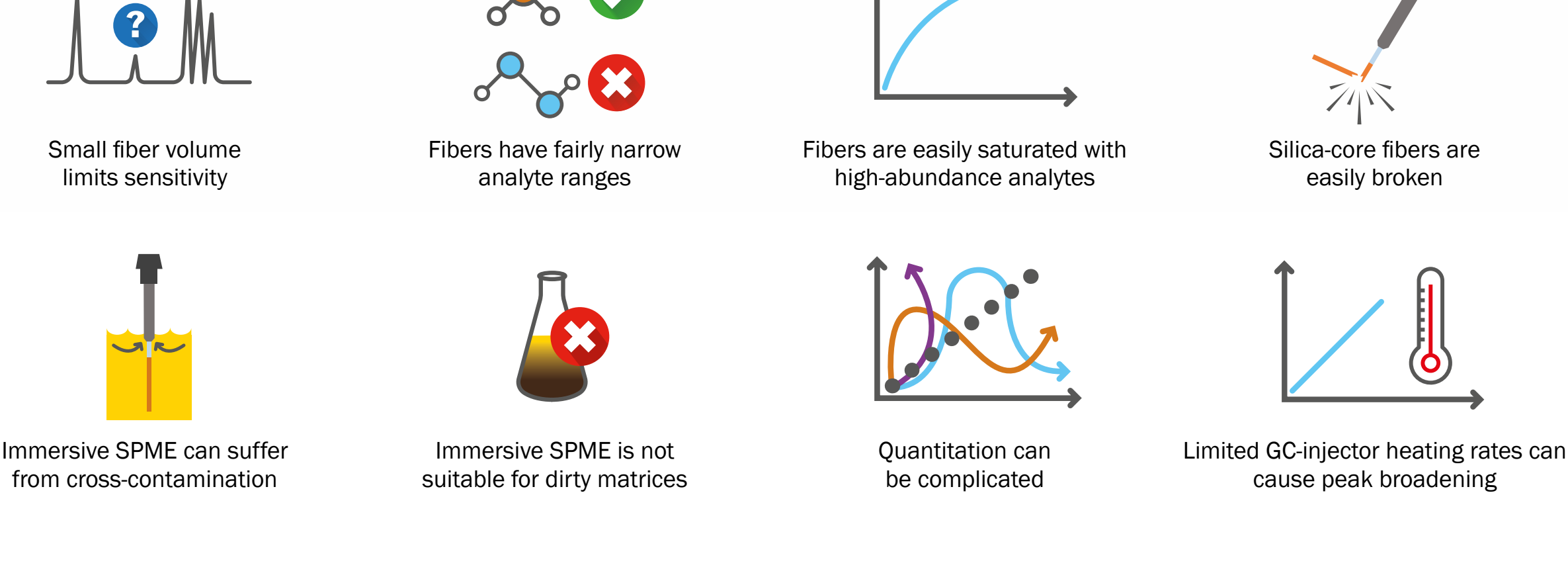
ADVANTAGES & DISADVANTAGES

SPME is a versatile technique with a range of benefits, enhanced further by the use of trapping.

ADVANTAGES



DISADVANTAGES



To learn more about automating SPME and SPME-trap using Markes Centri® automated sample extraction and concentration platforms, visit

www.markes.com/centri



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