The application of MEPS for the on-site preparation of water samples

MEPS uses a barrel insert and needle BIN device to reduce Solid-Phase Extraction (SPE) to a micro-scale suitable for small volume samples and for the on-line adaptation of conventional SPE techniques. Because the SPE cartridge (BIN) is incorporated into the needle assembly of a gas-tight syringe, MEPS is also a simple field-portable SPE device that can be operated manually without the need for sampling pumps or, alternatively, may be incorporated into robotic sampling systems.

To demonstrate the application of MEPS we report the qualitative use of 18-MEPS for the sampling of water bodies in both industrial and urban environments. Water samples were extracted on-site and then the MEPS syringes were transported back to the laboratory overnight for elution and analysis of the retained components. 18-MEPS was used to collect samples directly from industrial discharges and also used to recover semi-volatile residue for GCMS analysis. The technique was also applied to sampling droplets on surface extracts of paint for non-destructive surface profiling (Fig. 2).

Conclusion

MEPS was shown to be suitable for field sampling of hazardous and unstable materials.

In-service determination of hydrocarbon materials followed by the elution of more polar components in a constant solvent.

Sequential elution of C18-MEPS with solvents with very different solvating properties was found to be consistent with residual monomers from an epoxy coating. The concentration of bisphenol A and partially reacted monomers form a profile typical of this particular epoxy location. Tris-(2-butoxyethyl)phosphate is a common flame retardant in floorpolishes and polymers and so is also a consistent with residual monomers from an epoxy coating. The concentration of bisphenol A and partially reacted monomers form a profile typical of this particular epoxy location. Tris-(2-butoxyethyl)phosphate is a common flame retardant in floorpolishes and polymers and so is also a

The surface extract showed the presence of a series of phenolic and phenoxypropandiols that are consistent with residual monomers from an epoxy coating. The concentration of bisphenol A and partially reacted monomers form a profile typical of this particular epoxy location. Tris-(2-butoxyethyl)phosphate is a common flame retardant in floorpolishes and polymers and so is also a

Enhanced concentration of analyte can be achieved using MEPS in combination with a larger volume syringe and more sampling cycles and analyzing a greater proportion of the MEPS eluate.

MEPS devices are glass and stainless steel construction allowing them to be fully immersed for sampling at depth or, alternatively, used at needle depth to avoid perturbing the stream from which the sample was drawn. An extension pole also allowed sampling from outflows that were offensive and could be read with ease of use and mechanical stability of the MEPS syringe to allow us to demonstrate the potential of a sampling service to a remote site without the need for portable power supplies or other sampling paraphernalia.

An extension pole also allowed sampling from outflows that were offensive and could be expected to allow the elution of hydrocarbon materials followed by the elution of more polar components in a constant solvent.

MEPS Online Kit.

This solution pack provides all the hardware, software and support needed to add online SPE capability to your GCMS platform, using the MEPS SPE system.