

Trajan Scientific and Medical



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sub-ppt levels.

target LOD/ LOQ

essential but challenging, especially at

increasing injection volumes in analytical

and risk system fouling. Time-consuming

sample preparation is required to purify

essential for achieving ever decreasing

analytes and remove interfering matrix -

pro

manual

sive inter

esource

Time

Limitations of current methods:



Fully automated robotic sample preparation

Direct transfer to automated online SPE

10

11

12

CHRONECT[™] Workstation PFAS for automated PFAS analysis Per- and polyfluoroalkyl substances · Advantages of Online SPE & Automation: online SPE with LC-

- (PFAS) are a major environmental concern MS allows for large volume injections, analyte due to their persistence and harmful effects on human health. • Analytical challenges: accurate analysis of PFAS in different, complex matrices is
 - enrichment, and matrix removal, enhancing efficiency and reducing manual errors. Miniaturised automated approach, also of preceding solid-liquid extraction of solid matrices, offers economic and ecological advantages over manual methods, eliminating manual handling and lowering risk for error and external contamination.
- CHRONECT[™] is using modular components individually selected for a specific workflow. The CHRONECT™ Workstation PFAS fully automates the analytical procedure systems can compromise analytical quality of PFAS in solid and liquid environmental samples. It encompasses solid-liquid extraction, dispersive SPE, and online SPE LC-MS/MS, the analytical procedures are based on US EPA 1633 and in compliance with DIN 38414-14 and DIN 17892.

SPE elution merged with LC flow on column

LC-MS/MS analysis

CHRONECT ROBOTIC PAL3: 200 cm Dual head PAL

• Automated sample preparation prior to online SPE LC-MS/MS and autosampler for direct and SPE injections.

 Equipped with a variety of tools and modules, that are configured individually to meet the requirements of PFAS analysis.

High-Pressure-Dispenser (HPD)

• Syringe pump connected to ACE and injection valve; delivers solvents and sample through

- cartridges, elutes the cartridge in peak focusing mode for PFAS analysis.
- Equipped with trap between HPD and injector to remove system and solvent contaminants.

Automated Cartridge Exchanger (ACE)

- Places cartridges in flow path and returns them into tray; 4 high-pressure valves set the flow path.
- Cartridges: weak anion exchanger, ~3 mg sorbent material; in 10x1 mm PEEK housing.

SPH1299 Pump

• Can elute the cartridge depending on flow path setting: in peak focusing mode for PFAS analysis LC gradient merged with cartridge elution flow

• Equipped with trap between HPD and injector to remove system and solvent contaminants

Mistral – Column oven

• YMC Triart C18 100 x 3.0 mm ID, 3 μm, 12 nm analytical column and corresponding 50 mm guard column

TripleQuad LCMS (e.g., Shimadzu LCMS 8060NX)

Water: methanolic co-solvation approach combined with online SPE LC-MS/MS

• addition of MeOH to reach 50 % MeOH content, stabilising and resolubilising potential surface-adsorbed analytes, then injection to online SPE LC-MS/MS

Soil: fully automated extraction of soils combined with online SPE LC-MS/MS





Automated workflow







Retention time [min]



5

4

3



For elution the cartridge is transported to right clamp and HPD starts dispensing % NH₄OH/MeOH for elution in peak focusing mode (elution flow is merged with pump flow in T-rotor seal of ACE valve.

> Analytes are focused on analytical column as they elute from cartrdige and start separating with increasing gradient

Contact info@trajanscimed.com for further information

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