

SVOC in Water by Non-Chlorinated Solvent (lower-than-water density), ePrep ONE Automated Sample Preparation

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ePrep Applications

Key Benefits

- Fully Automated: End-to-end processing, no manual handling
- Cost Efficiency, and Sustainability: Enhanced laboratory efficiency and throughput
- Excellent Analytical Performance: Improved reproducibility and accuracy
- Environmental: Non-chlorinated, reduced toxicity
- Safety: Reduces exposure to hazardous chemicals

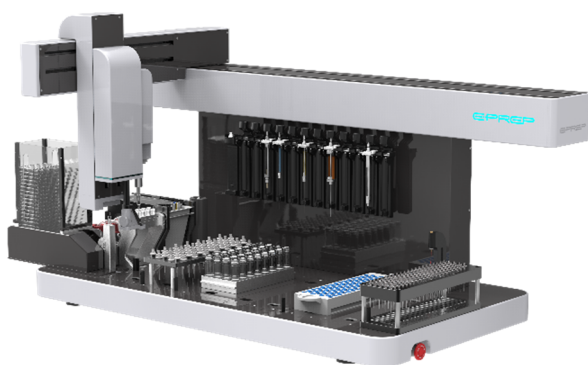


Figure 1: ePrep Sample Preparation Workstation

Introduction

The ePrep ONE delivers fully automated SVOC-Water sample preparation using low-density, non-chlorinated extraction solvents as an alternative to traditional dichloromethane (DCM). This approach eliminates health, safety, and environmental concerns associated with chlorinated solvents while maintaining excellent analytical performance.

The workflow features ePrep's automated micro liquid-liquid extraction (ALLEX) technology, using analytical syringes to create micron-sized organic droplets that maximize extraction efficiency. Modified cyclohexane-based extraction delivers improved extraction efficiency and scalability compared to conventional methods while significantly reducing solvent consumption and maintaining regulatory equivalence.

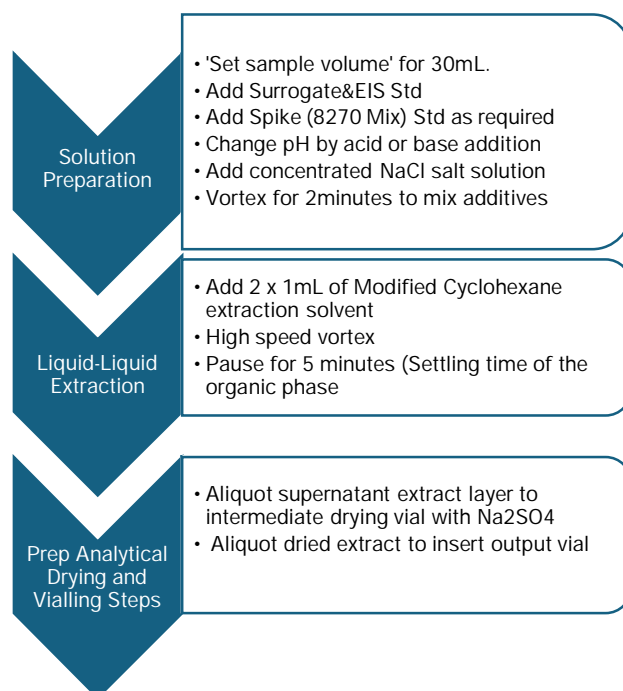


Figure 2: Flow chart – ePrep workflow

Processing samples directly in 40 mL VOA field collection bottles eliminates sample transfer and bottle washing, removing the risk of losing wall-absorbed target analytes. Using 2 mL extraction solvent provides a 15× concentration factor without evaporation or reconstitution steps.

Experimental

Instrumentation: ePrep Sample Preparation Work Station with low-density solvent extraction configuration. Analytical GC-MS/MS (Agilent 8890 GC with 7010B QQQ system).

Tap water samples were spiked with EPA 8270 Mega Mix at 3.33 ppb (yielding 50 ppb in final cyclohexane extract).

Quantification: Normalized against extractable internal standards (EIS) to account for extraction efficiency and workflow variability.

Results and Discussion

Analysis using EIS quantitation demonstrated excellent recovery rates and RSDs across EPA 8270 SVOCs. Phenolic compounds (2,4-dinitrophenol, pentachlorophenol, dinitro-cresol) showed recoveries consistent with traditional EPA 8270 methods. Select neutral analytes (bis(2-chloroethyl)ether, isophorone, bis(2-chloroethoxy)methane, 2,4-dinitrotoluene, dimethyl phthalate, di-n-octyl phthalate) may benefit from sequential neutral-then-acid extraction. This Application Note covers acid-modified extraction only; basic compounds (pH >11) require a separate dedicated workflow.

Scalability: 100 mL Sample Option

The workflow can be scaled to 100 mL samples using 120 mL glass bottles with 6 mL extraction solvent, providing a 16.7× concentration factor without evaporation steps. Analytical results demonstrated excellent recovery rates and reproducibility similar to the 30 mL method.

Conclusion

The ePrep ONE system provides fully automated SVOC-Water sample preparation using low-density, non-chlorinated extraction solvents to achieve results comparable to traditional DCM-based EPA Method 3511.

Excellent analytical recovery rates and reproducibility for EPA 8270 SVOCs. The method is scalable to 100 mL samples.

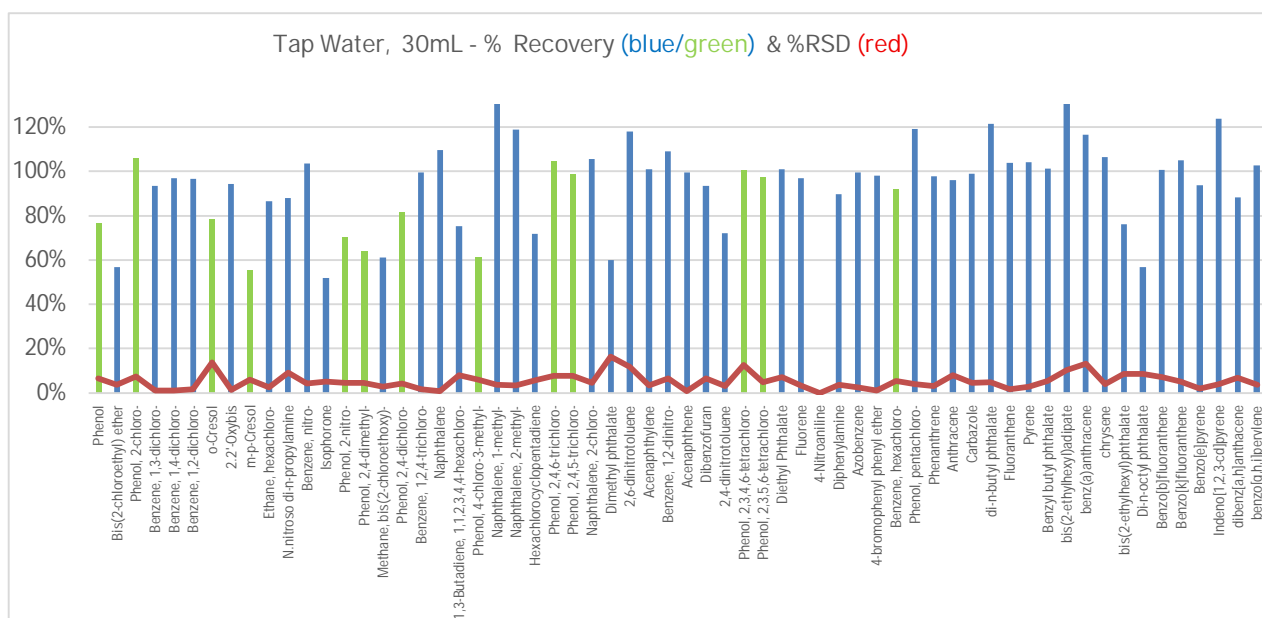


Figure :3 Recovery rate and RSDs SVOCs in Tap Water, extracted with solvent modified Cyclohexane

Other Publications and Resources

Publication	Description
98-35055AP	SVOC Water by Non Chlorinated Solvent Application Note
98-35038WP	White Paper: SVOC Water (EPA 3511)
98-35038SOP	Standard Operating Procedure: SVOC Water (EPA 3511)
Workflows	ePrep Plug-n-Play Workflow Available for SVOC Water by Non Chlorinated Solvent

* Contact your ePrep distributor to obtain copies of these resource materials

www.eprep-analytical.com

Publication No. 98-35055AN, R01

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