

Miniaturization of SVOC in Water, Automated on ePrep ONE (equiv. EPA 3511)

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ePrep Applications

Key Benefits

- **EPA 3511 Equivalency:** Miniaturized Automation for SVOC Analysis
- **Cost Efficiency, and Sustainability:** Up to 85% reduction in solvents, standards and reagents
- **Laboratory Throughput:** Faster extraction cycles increase daily sample capacity
- **Analytical Flexibility:** Enables analysis of limited-volume samples from environmental monitoring or pilot studies

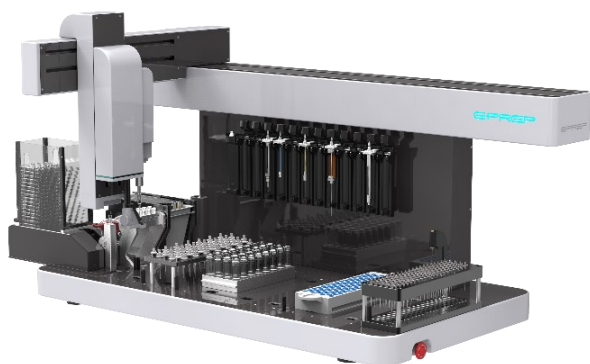


Figure 1 ePrep Sample Preparation Workstation

Introduction

EPA Method 3511 is widely used for SVOC determination in aqueous samples through liquid-liquid extraction (LLE). Traditional preparation involves labor-intensive procedures requiring significant solvent volumes and manual handling. This miniaturized automated approach using the ePrep system aligns with standard EPA 3511 workflows (Application Note 98-35038, 35 mL sample/2 mL DCM) while significantly advancing extraction efficiency.

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. The system automates all steps outlined in Figure 2.

Processing samples directly in 6 mL headspace (HS) high recovery (HR) field collection bottles

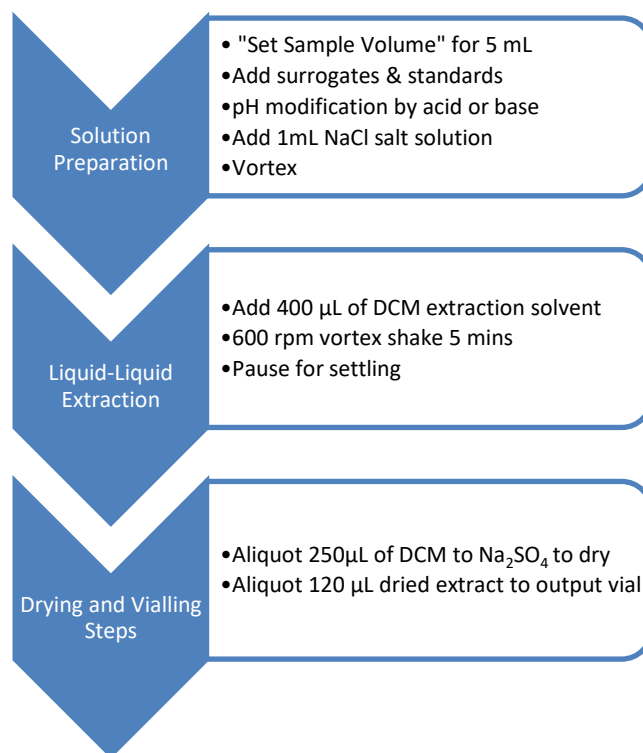


Figure 2: ePrep workflow flowchart

eliminates transfer steps and bottle washing, improving recoveries, reproducibility, reducing solvent usage, lowering labor costs, and enhancing safety.

Experimental

Instrumentation: ePrep Sample Preparation Work Station and miniaturized EPA 3511 configuration with acid extraction. Analytical GC/MS, GC/MS/MS or similar depending on LOD/LOQ.

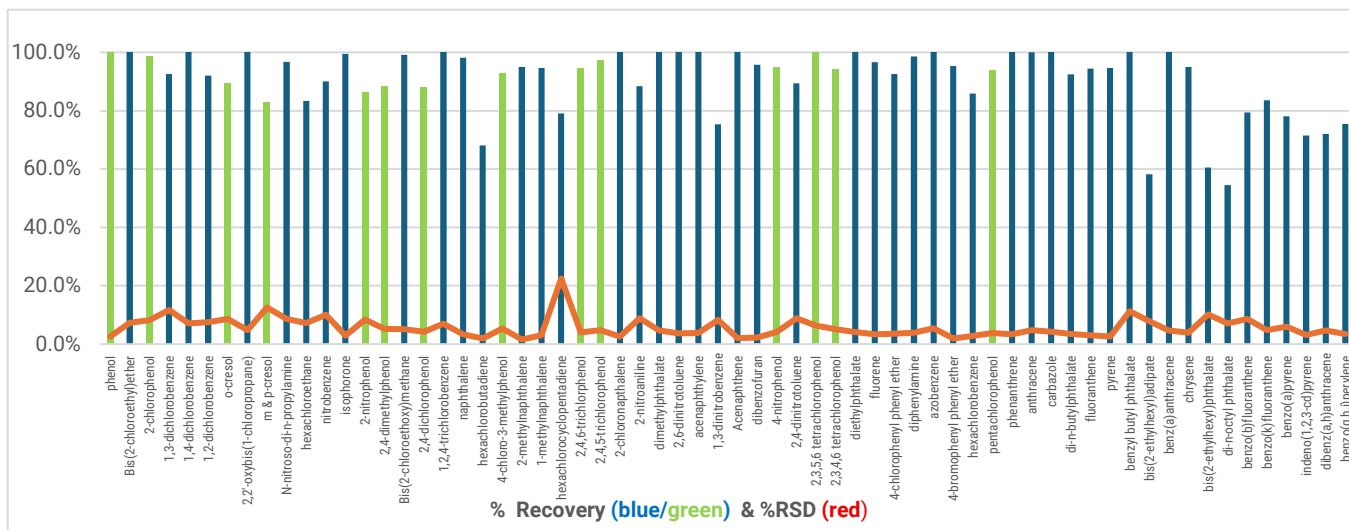


Figure 3: Recovery rate and RSDs for Drinking water – EIS normalised quantitation

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

Results and Discussion

Analysis demonstrated excellent recovery rates and RSDs (n=8) for 8270 SVOCs including phenolic compounds as shown in Figure 3.

Modifications to the workflow are easily made to target specific compound classes.

Conclusion

The ePrep ONE system delivers fully automated SVOC sample preparation with miniaturized volumes (5 mL/0.4 mL DCM), processing field samples without manual intervention.

When quantified against extractable internal standards, the method achieves recoveries and reproducibility comparable to conventional 35 mL/2 mL protocols. Providing a scalable solution that optimizes SVOC analysis while maintaining analytical quality, EPA 3511 regulatory compliance, and operational efficiency.

ePrep Miniaturization Advantages:

Parameter	ePrep Miniaturized 3511 (5mL)	Manual EPA3511 (35mL)	Manual EPA 3510 (1L Sep Funnel)
Minutes /sample	4.5	12.5	50
Samples/ batch	50	20	10
Sample/DCM volumes	5 mL /0.4 mL	35 mL/2 mL	1000 mL /180 mL
Est. Prep cost per sample @ 200samples/day	\$2.2/sample	\$11/sample	Not Available

Other Publications and Resources

Publication	Description
98-35058AP	Miniaturized EPA 3511 APP NOTE
98-35038SOP	Standard Operating Procedure SVOC Water (3511)
Workflows	ePrep Plug-n-Play Workflow Available for SVOC Water (3511 and Miniaturized 3511)

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

www.eprep-analytical.com

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