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If you have questions about applying methodology described in this article to a current application, please contact our technical service chemists.

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Fast Screening of Water and Soil Samples, Using Solid Phase Microextraction (SPME)

Tamra L. Schumacher, Lancaster Laboratories, Lancaster, PA, USA

At Lancaster Laboratories, we use solid phase microextraction as a time-saving sample screening measure that provides valuable and reliable information on volatile organic compounds (VOCs) in water and soil samples. Samples containing concentrations above the calibration range of our purge and trap/GC and GC/MS analyses can be adjusted to concentrations within the calibration range. By eliminating system overload and cross-contamination, screening saves at least 30 minutes for high VOC-containing samples.

To be useful to us, a screening procedure must be fast (approximately 2 minutes), easy to use, and inexpensive to run, and must provide high productivity (at least 80-90 samples per technician per shift). The procedure must demonstrate high reliability and serviceability, the ability to monitor aromatic, halogenated, and aliphatic organics, and adaptability to

automation. SPME has met these specifications.

Figure A shows the result of our SPME/GC/FID screening process. A sample is characterized in less than 2½ minutes. Note that the 30µm polydimethylsiloxane SPME fiber and short, narrow bore, thick film SPB™-1 column enable us to monitor a wide range of analytes.

In our procedure at Lancaster Laboratories, SPME is fast, accurate, and easy to use. The system demonstrates a broad linear range without significant problems with carryover/contamination. The Varian 8200CX SPME AutoSampler we use is inexpensive to maintain. And, since we perform all GC maintenance and repairs in-house, we are able to minimize system downtime.

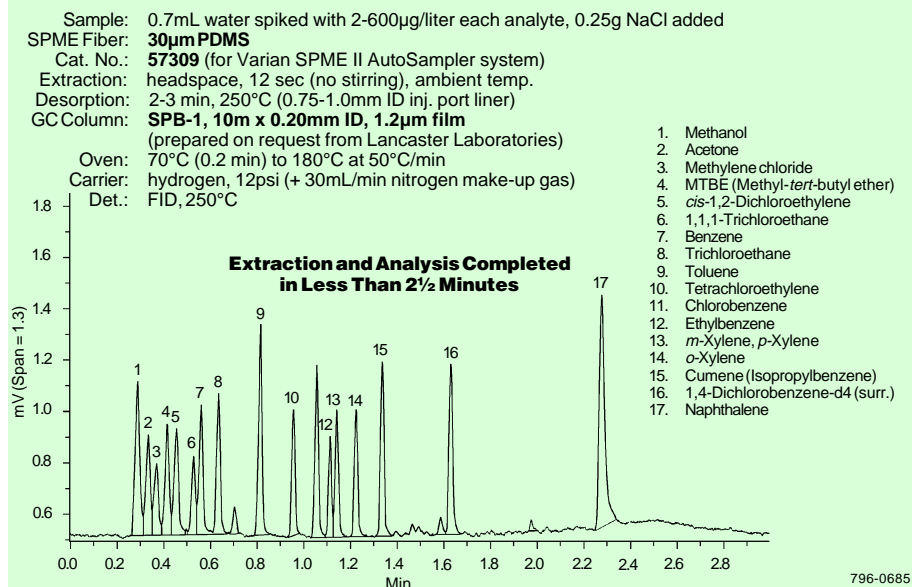


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"Thanks to SPME applications such as water and soil prescreening, we can meet our clients' needs in a timely and cost-effective manner."

— Tamra L. Schumacher,
Lancaster Laboratories

Figure A. Water Sample Screened for BTEX and Other Compounds



Ordering Information:

Description	Cat. No.
SPME Holder*	
manual sampling	57330-U
AutoSampler	57331
SPME Fibers, 30µm PDMS	
pk. of 3	
manual sampling	57308
AutoSampler	57309

*Initially you must order both holder and fiber assembly. Holder is reusable indefinitely. Use Cat. No. 57331 with Varian 8100/8200 AutoSampler (requires Varian SPME upgrade kit, available from Varian), or with Supelco™ SPME/HPLC interface.

Solid phase microextraction technology licensed exclusively to Supelco. US patent #5,691,206; European patent #0523092.

Acknowledgment

All information and illustrations in this article were submitted by Tamra L. Schumacher, Lancaster Laboratories (a division of Thermo Analytical, Inc.), 2425 New Holland Pike, P.O. Box 12425, Lancaster PA 17605-2425.

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Table 1. Good Agreement Between Purge and Trap and SPME

	Analyte / Mean % Agreement (µg/L detected)			
	Benzene	Toluene	Ethylbenzene	Xylene
Water Samples	119	125	91	93 (total)
Soil Samples	—*	107	97	91 (m,p) 96 (o)

*Below SPME limit of detectability N = 11 water samples or 8 soil samples.

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