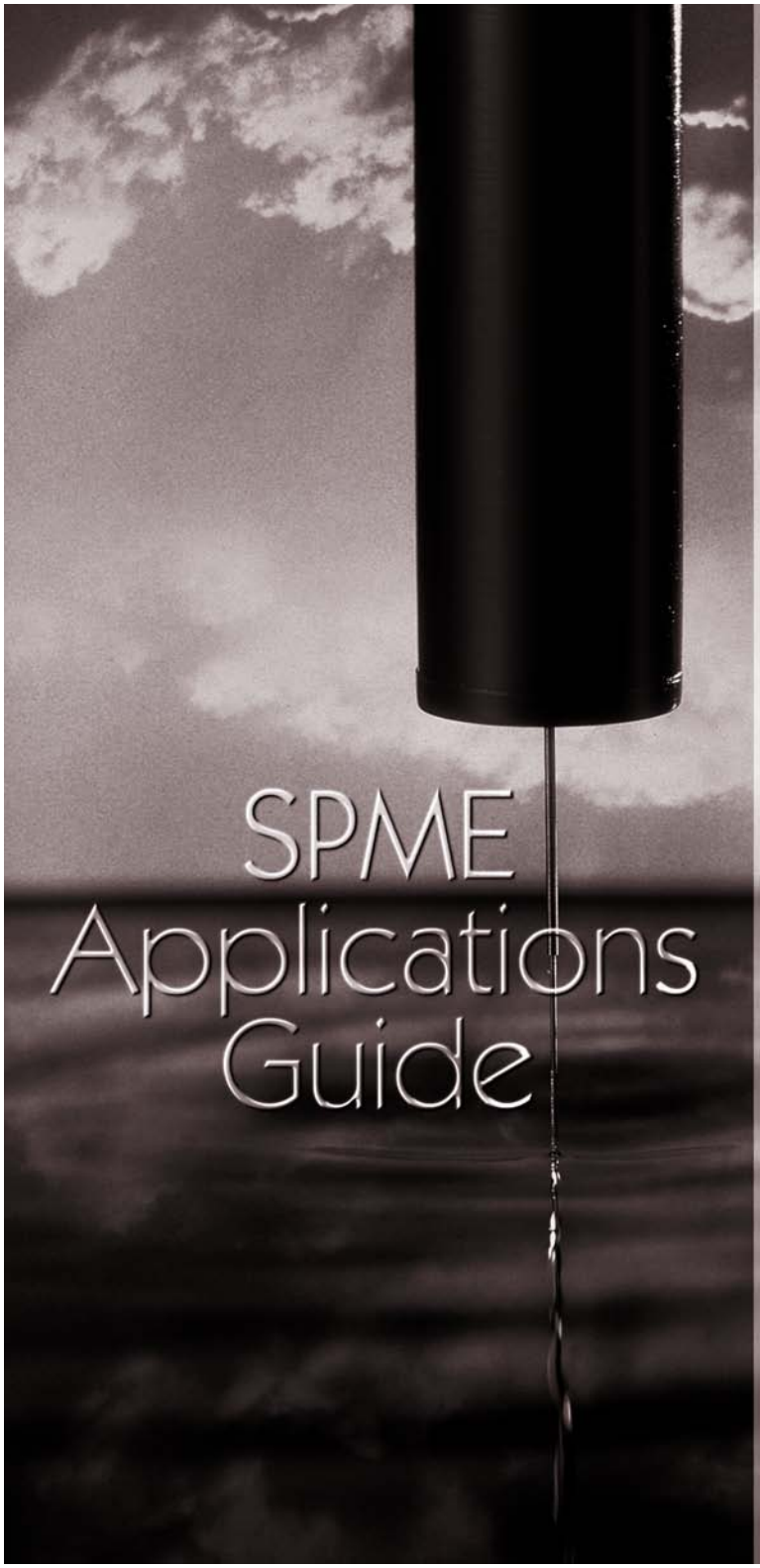

3rd Edition

SPME Applications Guide

Table of Contents

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SPME Applications Guide

The SPME Applications Guide is a bibliographic resource of more than 750 published technical articles about solid phase microextraction. With the continued growth of SPME, and its expansion into environmental, food, forensic, and other fields, we recognize the need for an organized bibliography. This guide should serve a useful purpose in your SPME research and analyses.

This guide is for general information only. We have made every attempt to make the information as complete and accurate as possible. Where entries are missing, information was not available at the time of printing.

The new additions to the reference list are highlighted in bold.

NOTE: Because of copyright restrictions, Supelco cannot provide copies of the articles listed. If you desire copies, please refer to the publications cited.

Using This Guide

This guide is organized in an easy-to-use format. The references are grouped into application areas (see the Table of Contents). The *Analyte/Matrix* column identifies the class of analytes and the sample matrix. The *Literature Reference* column provides the title of the article, journal reference, and authors. The next column describes the SPME fiber and conditions used in the sample extraction. The last column indicates the instrument used in the analysis.

Key to Abbreviations

Abbrev.	Description
AED	atomic emission detection
DVB	divinylbenzene
ECD	electron capture detection
FID	flame ionization detection
FPD	flame photometric detection
FTD	flame thermonic detection
GC	gas chromatography
HPLC	high pressure liquid chromatography
ICP	inductive coupled plasma
MS	mass spectrometry
MSD	mass selective detection
NPD	nitrogen/phosphorus detection
PAD	photodiode-array detection
PDMS	polydimethylsiloxane
PICI	positive ion chemical ionization
SIM	selective ion monitoring
TCD	thermionic-selective detection
TED	thermal energy detection
VIS	visible spectrophotometry

SPME Application Guide 3rd Edition

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
Books				
		Techniques for Analyzing Food Aroma, Marcel Decker ISBN: 0-8247-9788-4, Marsili, R.		
		Solid Phase Microextraction: A Practical Guide Edited by SueAnn Scheppers Wercinski Marcel Decker 15BN: 0-8247-7058-7		
		Applied SPME, 1999, 364-371 Royal Society of Chemistry, Cambridge, UK Coden: 67TUA8 Talon, R, Montel, M.		
		Solid Phase Microextraction: Theory and Practice Edited by Janusz Pawliszyn VCH, New York, 275pp (1997)		
		Applications of Solid Phase Microextraction Edited by Janusz Pawliszyn RSC Chromatography Monographs ISBN 0-85404-525-2 Royal Society of Chemistry 1999		
Foods				
601	**Aroma compounds in food**	**Developments in extraction techniques and their application to analysis of volatiles in foods Trends-Anal-Chem, May 2000, 19(5), 322-329 Sides, S., Robards, K., Helliwell, S.**	**Review article**	**GC**
602	**Contaminants in Food**	**Application of SPME in Food Analysis J. Chromatogr. A (2000), 880(1+2), 35-62 Kataok, H., Lord, H., Pawliszyn, J.**	**Review article**	**GC, LC, MS**
8	Caffeine and flavors in coffee/tea/cola	Solventless Determination of Caffeine in Beverages Using SPME with Fused Silica Fibers J. Chromatogr. 603: 185-191 (1992) Hawthorne, S., Miller, D., Arthur, C., Pawliszyn, J.	uncoated fiber 5 min	GC-MS
32	Flavors in coffee/fruit juice/ vegetable oil	Solid Phase Microextraction for Flavor Analysis J. Agric. Food Chem, 42: 1925-1930 (1994) Peppard, T., Yang, X.	100µm PDMS 10 min	GC/GC-MS
603	**Volatiles in vegetable oil**	**Analysis of volatile contaminants in vegetable oils by headspace SPME with Carboxen-based fibers. J. Chromatogr. 873 (2000): 79-94 Page, B., Lacroix, G.**	**Carboxen/PDMS 30-45 min @ 100°C headspace**	**GC-MS**
39	Halogenated volatiles in food	Application of SPME to the Headspace GC Analysis of Halogenated Volatiles in Selected Foods J. Chromatogr. 648 (1): 199-211 (1993) Page, B., Lacroix, G.		GC
41	Fatty acids C2-C10 in water	Determination of Fatty Acids Using SPME Anal. Chem: 67: 4396-4403 (1995) Pan, L., Adams, M., Pawliszyn, J.	85µm polyacrylate Low pH, salt derivative: 1-pyrene-diazomethane	GC/GC-MS
42	Flavors in corn oil	Measuring Flavors Using SPME Food Quality January/February 1995, pp40-41 Mindrup, R.	100µm PDMS 40°C, 45 min	GC-MS
181	Flavors in coffee, potato chips	SPME Associated with Microwave Assisted Extraction of Food Products J. High Res. Chromatogr. 20 (4): 213-216 (1997) Wang, Y., Bonella, M., Khaled, M., McNair, H.	100µm PDMS pH 2, salt headspace 10 min	SIM GC-MS

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
60	Sulfur volatiles in truffle aroma	Headspace SPME Analysis of Volatile Organic Sulfur Compounds in Black and White Truffle Aroma J. Agric. Food Chem, 43 (8): 2138 (1995) Pelusio, F., Nilsson, T., Tino, R., Larsen, B., Montnarell, L.		
604	**Aroma compounds in fermented cucumbers**	**Determination of major aroma impact compounds in fermented cucumbers by SPME-GC-MS-Olfactometry detection** **J. Chromatogr. Sci. (2000), 38(7), 307-314** **Marsili, R., Miller, N.**		**GC-MS**
61	Flavors in cinnamon bark	SPME of Flavor Compounds -- A Comparison of Two Fiber Coatings and Discussion of the Rules of Thumb for Adsorption LC-GC 13 (11): 882-886 (1995) Yang, X., Peppard, T.	100µm PDMS, 85µm polyacrylate 120°C headspace	GC-FID
62	Flavors in apple essence, seeds, candy	SPME and Chiral Gas Chromatography Separations LC-GC 13 (9): 734-740 (1995) Mani, V., Woolley, C.	100µm PDMS 30°C or 40°C headspace	GC-FID
63	Essential oils in hops	Determination of Essential Oils in Hops by Headspace SPME J. Agric. Food. Chem, 44: 1768-1772 (1996) Field, J., Nickerson, G., James, D. Heider, C.	100µm PDMS 50°C, 4 hr	GC-FID
605	**Essential oils in yarrow**	**Production of Yarrow (Achillea millefolium L.) in Norway: Essential Oil Content and Quality** **J. Agric. Food Chem, (2000) 48 No,12, 6205-6209** **Rohloff, J., Skagen, E., Steen, A., Iversen, T.**		
221	Essential oils in Virginia cedar oil	A Comparison of Selected Analytical Approaches to the Analysis of an Essential Oil Flavour and Fragrance Journal 12 (1): 1-8, (1997) Coleman, W., Lawrence, B.	100µm PDMS 10-120 sec headspace	GC-MS
396	Essential oils in Virginia cedar oil	Automatic Injection SPME-Chiral-GC-MSD Analysis of Essential Oils J.Chromatographic Sci., Vol. 36, Dec. 1998, 575-578 Coleman, W., Perfetti, T., Lawrence, B.	7µm PDMS 6 sec headspace stirring	GC-MS
444	Volatiles in sunflower oil	Identification of Volatile Compounds in Sunflower Oil by Headspace SPME and Ion-Trap GC/MS J. High Resolut. Chromatgr. (1998), 46(7), 2744-2747 Keszler, A., Heberger, K., Gude M.	100µm PDMS	GC-MS
569	12 Aldehydes in sunflower oil/water	Influence of extraction parameters and medium on efficiency of SPME sampling in analysis of aliphatic aldehydes J-Chromatogram-A. 11 Jun 1999; 845(1-2): 337-347 Keszler,-A; Heberger,-K	100µm PDMS 30 min @ 40°C headspace	GC-MS
447	Xylene in palm oil	Determination of trace xylene in contaminated palm oil by SPME and capillary GC Fenxi Huaxue (1999), 27(6), 676-678 Chen, W., Guo, C., Hu, C.	100µm PDMS 1 min. 60°C headspace	GC-FID
577	Dimetyl disulfide & methanethiol in butter	Volatile reduced sulfur compounds in butter by SPME J-Dairy-Res. Feb 1999; 66(1): 115-123 Shooter,-D; Jayatissa,-N; Renner,-N	85µm polyacrylate 10 min. @ 30-35°C	GC-EID
338	Benzene, toluene in vegetable oil	Determination of benzene & toluene in vegetable oil by SPME/HPLC J. Commod. Sci. (1999), 38(1), 3-14 Giuffrida, R., Clasadonte, M., Zerbo, A.	headspace	HPLC

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
606	**Volatiles in vegetable oil**	**Headspace SPME use for the Characterization of volatile compounds in vegetable oils of different sensory quality J. Agric Food Chem, (2000), 48(6), 2360-2367 Jelen, H., Obuchowska, M., Zawirska-Wojtasiak, R.**	**Carboxen/DVB/PDMS 20-60°C headspace**	**GC-FID**
106	Flavors in beer	Characterization of Beer Samples Using SPME-GC Analysis Supelco Reporter Vol. 16, #4, pg. 7 Vas, G.	100µm PDMS 10 min	GC-FID
607	**Sulfur compounds in beer**	**Determination of sulfur compounds in beer using headspace SPME and GC analysis with pulsed FPD detector J. Chromatogr. A. (2000), 872(1+2), 203-213 Hill, P., Smith, R.**	**Carboxen/PDMS headspace**	**GC-FPD**
100	Flavors in vodka	Characterization of Commercial Vodkas by SPME-GC/MS J. Sci. Food Agric. 70: 380-388 (1996) Ng, L., Hupe, M., Harnois, J., Moccia, D.	100µm PDMS 1 hr	GC-MS
202	Methylcyclopendienyl manganese tricarbonyl in beverages	Determination of Methylcyclopendienyl Manganese Tricarbonyl in Beverages by SPME Food Addit. Contam. 14 (3): 301-307 (1997) Forsyth, D., Dusseault, L.		
395	Aroma volatiles in onion	Determination of Fresh Onion (Allium Cepa L) Volatiles by SPME Combined with GC/MS Z Lebedsm Unters Forsch A (1998) 207: 39-43 Jarvedpaa, E., Zhung, Z., Huopalahti, R., King, J.	100µm PDMS 1 min headspace	GC-MS
101	Flavors in cheese	SPME for Cheese Volatile Compound Analysis J. Food Sci. 61: 1118-1129 (1996) Chin, H., Bernhard, R., Rosenberg, M.	100µm PDMS, polyacrylate 60°C, 20 min	GC, GC-MS
380	Aroma volatiles in cheese	Pattern Recognition of Swiss Cheese Aroma Compounds by SPME/GC and an Electronic Nose Milchwissenscaft (1998) 53 (5) 259-263 Jou, K., Harper, W.	85µm polyacrylate 40°C, 30 min headspace	GC-FID
449	Aroma volatiles in cheese	Cryo-trapping/SPME/GC analysis of cheese aroma Talanta (1999) 48(4), 747-753 Jaillais, B., Bertrand, V., Auger, J.	100µm PDMS 4 min @ 20°C headspace	GC-FID, EMS
187	Volatiles in whey protein	A Study of Volatile "Trapping" in Spray-Dried Whey Protein Concentrate by Crushing and/or Vacuuming and Detection by SPME/GC-MS Food Res. Int. 29: 495-504 (1996) Stevenson, R., Chen, X.		GC-MS
379	Volatiles in whey protein	Use of SPME of Volatile Compounds in Whey Protein Concentrates Milchwissenschaft (1998) 53 (4) 209-212 Yang, J., Li, W., Harper, W.	85µm polyacrylate 40°C, 30 min headspace, stirring	GC-MS
450	Volatiles in whey protein	Headspace sampling of whey protein concentrate solutions using SPME Food Res. Int. (1999), 31(5), 371-379 Le Quanch, M., Chen, X., Stevenson, R.	headspace	GC-MS
422	Flavors in protein	Isolation of Flavor Compounds from Protein Material ACS Symp. Ser. (1998), 705 (Flavor Analysis), 107-115 Mills, O., Broome, A.		
102	Flavors in tobacco	Qualitative and Quantitative Analysis of Flavor Additives on Tobacco Products Using SPME-GC-MS J. Agric. Food Chem. 45: 844-849 (1997) Clark, J., Bunch, J.	Carbowax/DVB 95°C, 15 min headspace	GC-MS

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
137	Phenols in tobacco smoke	Quantitative Determination of Phenols in Mainstream Smoke with SPME-GC Selected Ion Monitoring MS J. Chromatogr. Sci. 34: 272-275 (1996) Clark, J., Bunch, J.	Polyacrylate Buffer, 1 hr	GC-MS
608	**Acetates in Cigarette tobacco**	**Quantitative analysis of acetates in cigarette tobacco using SPME and GC-MS** **J. Chromatogr. Sci. (2000), 38(4), 137-144** **Watxon, C., Ashley, D.**		**GC-MS**
369	Carboxylic acid esters in tobacco	Derivatization of SPME GC-MS Determination of Organic Acids in Tobacco J. Chromatographic Science, Vol. 35, (1997) 209-212 Clark, J., Bunch, J.	85µm polyacrylate 15 min, stirring MeOH-HCl derivatives	GC-MS
431	Phenols in honey	Application of SPME in Determination of Phenol in Honey Riv. Sci. Aliment, (1997) 26(3/4), 97-102 Conte, L., Botolomeazzi, R., Moret, S., Sibaini, A., Marcazzan, G.		
433	Volatile organics in honey	Identification of Volatile Organic Compounds Present in Different Honeys Through SPME and GC/MS Ind. Alimenti., (1998), 37(368), 351-356 Guidotti, M., Vitali, M.		GC-MS
109	Aroma volatiles in carbonated cola beverages	Comparison of Dynamic Headspace Concentration on Tenax with SPME for Analysis of Aroma Volatiles J. Agric. Food Chem. 45: 2638-2641 (1997) Elmore, S., Erbahdir, M., Mottram, D.	100µm PDMS, 85µm polyacrylate 60°C, 30 min headspace	GC-MS
349	Aroma volatiles in brewed coffee	SPME Applications in Gas Chromatography Olfactometry Dilution Analysis J. Agric. Food Chem. 1999, 47, 1616-1618 Deibler, K., Acree, T., Lavin, E.	100µm, 30µm, 7µm PDMS 1-90 min headspace, stirring	GC-FID
119	Aroma in food products	Solid Phase Microextraction: A Valuable Problem Solver Food Product Design December 1996, pp 73-77 Marsili, R.	various fibers & extraction conditions	
128	Flavor volatiles in fruit juice	Analysis of Flavor Volatiles Using Headspace SPME J. Agric. Food Chem. 44: 2187 (1997) Steffen, A., Pawliszyn, J.	85µm polyacrylate 60 min, salt added headspace, stirring	GC-FID
609	**Aroma compounds in Brazilian fruit**	**Screening of Brazilian fruit aromas using SPME-GC-MS** **J. Chromatogr. A.,873(1), 117-127** **Augusto, F., Valenta, A., dosSantos, T., Rivellino, S.**	**various fibers headspace**	**GC-MS**
425	Volatiles in fruit	Analysis of Volatile Fruit Components by Headspace Solid Phase Microextraction Food Chem. (1998), 63(2), 281-286 Ibanez, E., Lopez-Sebastian, S., Ramos, E., Tabera, J. Reglero, G.	100µm PDMS 30 min @ 30°C headspace	GC-MS
130	Flavor volatiles in fruit beverage	Flavor Volatiles in Fruit Beverage with Automated SPME Food Test. Anal, 16: 2 (1996) Penton, Z.	100µm PDMS, 85µm polyacrylate 20 min, headspace	GC-FID
424	Oxidative byproducts in citrus hystrix oil	Changes in Citrus Hystrix Oil During Autoxidation Dev. Food Sci. (1998), 40 (Food Flavors: Formation, Analysis and Packaging Influences), 707-718 Pudil, F., Wijaya, H., Janda, V., Volfova, J., Valentova, H., Porkorny, J.		

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
358	Flavor compounds in orange juice	Optimization of SPME Analysis for Headspace Flavor Compounds of Orange Juice J. Agric. Food Chem. 1998, 46, 2744-2747 Jia, M., Zhang, H., Min, D.	100µm PDMS 60°C, 20 min headspace, stirring	GC-FID
451	Flavor compounds in orange juice	Pulsed electric field processing effects on flavor compounds and microorganism of orange juice Food Chem (1999), 65(4), 445-451 Jia, M., Zhang, Q, Min, D.		
561	Flavor compounds in orange juice	Volatiles from Unpasteurized and Excessively heated orange juice with SPME and GC Olfactometry J. Food Science, Vol.64, N0.5, 1999, 800-803 Bazemore, R., Goodner, K. Rouseff, R.	75µm Carboxen/PDMS 30 min Headspace 40°C	GC-MS
359	Flavors in fruit juices	Comparison of Gas-Sampled and SPME-Sampled Static Headspace for the Determination of Volatile Flavor Compounds Anal. Chem. Vol. 71, No. 1, January 1, 1999, pg 23-27 Miller, M., Stuart, J.	65µm PDMS/DVB 40°C, 30 min headspace	GC-MS
131	Flavor volatiles in apples	Solid Phase Microextraction for Quantitative Headspace Sampling of Apple Volatiles Anal. Chem. 68: 4114 (1996) Matich, A., Rowan, D., Banks, N.	100µm PDMS 30 min headspace	GC-MS
203	Flavor volatiles In apples	Rapid Analysis of Volatile Flavor Compounds in Apple Fruit Using SPME & GC-Time-of-Flight Mass Spec J. Agric. Food Chem. 45: 1801-1807 (1997) Song, J., Gardner, B., Holand, J., Beaudry, R.	100µm PDMS 2-8 min headspace	GC-FID
433	Volatiles in red delicious apples	Volatile Production and Fruit Quality During Development of Superficial Scald in Red Delicious Apples Food Res. Int. (1997), 30(2), 95-103 Paliyath, G., Whiting, M., Stasiak, M., Murr, D., Clegg, G.		
383	Flavor volatiles in tomato, strawberry	Application of SPME and GC/Time-o-Flight Mass Spectrometry for Rapid Analysis of Flavor Volatiles in Tomato and Strawberry Fruits J. Agric. Food Chem. 46: 3721-3726 (1998) Song, J., Fan, L., Beaudry, R.	65µm PDMS/DVB 23°C, 12 min headspace	GC-MS
452	Flavor volatiles in tomato, strawberry, raspberries, apples	A new concept for the measurement of total volatile compounds of food Z. Lebenam. Unters, Forsch A, 1999, 208(4), 254-258 Azodanlou, R., Darbellay, c., Luisier, J., Villettaz,J., Amode, R.		
387	Flavor volatiles in tomato	Comparison of Three Sample Preparation Techniques for the Determination of Fresh Tomato Aroma Volatiles Book: Flavor Science: Recent Developments, Buttery & Shadhidi, Washington, DC, 1998 p. 289-292 Krumbein, A., Ulrich, D.	100µm PDMS 30°C, 10 min headspace salt added	GC-MS
400	Flavor volatiles in tomato juice	Effect of Thermal Treatment in the Headspace Volatile Compounds of Tomato Juice Istituto di Indstrie Agrarie, University of Perugi, via S. Costnazo I-06126, Pergia-Italy Servili, M., Selvaggini, R., Begliomini, A., Montedoro, G.	65µm Carbowax/DVB 35°C, 30 min CaCl added	GC-MS
214	Strawberries & apples in fruit homogenate	Solid-Phase Microextraction: Artifact Formation and Its Avoidance Chromatographia 46: 63-66 (1997) Verhoeven, H., Beuerle, T., Schwab, W.	85µm polyacrylate 30 sec immersion	GC-MS

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
132	Aroma volatiles in strawberry	Analysis of Strawberry Aroma by SPME Dtsch. Lebesm - Rundsch. 91: 349 (1995) Ulrich, D., Eunert, S., Hober, E., Rapp, E.		
590	Aroma volatiles in strawberries	A new concept for the measurement of total volatile compounds of food. Z-Lebensm-Unters-Forsch-A. Apr 1999; 208(4): 254-258 Azodanlou-R; Darbellay,C; Luisier,JL; Villettaz,JC; Amado,R	PDMS, CW/DVB, PDMS/DVB polyacrylate 30 min @ 25°C headspace	GC-FID
133	Aroma volatiles in banana	Evaluation of the Solid Phase Microextraction of Aroma Compounds in Banana Collog.-Inst. Nat. Rech. Agron. 75 (Bioflavour 95) 117 (1995) Picque, D., Normand, A., Corrieu, G.		
150	Pyrazines	SPME of Pyrazines in Model Reaction Systems J. Sci. Food Agric. 72: 91 (1996) Ibanez, E., Bernhard, R.		
356	Menthol (natural)	SPME-GC-Mass Selective Detection Analysis of Selected Sources of Menthol J. Chromatogr. Sci. (1998), 36(8) 401-405 Coleman, W., Lawson, S.	65µm Carboxen/PDMS 50°C, 20 sec headspace	GC-MS
453	Menthol, menthone food/pharmaceutical	Determination of menthol and menthone in food and pharmaceutical products by SPME-GC J. Chromatogr., A 1999, 847 (1+2), 161-169 Ligor, M., Buszewski, B.	ethoxy dimethylsiloxane 15 min @ 30°C immersed	GC-FID
610	**Aroma in perfume**	**Measurement of gas-liquid partition coefficient and headspace concentration profiles of perfume materials by SPME and capillary GC-MS J. Chromatogr. Sci. (2000), 38(9), 377-382 Liu, Z. Wene, M.**	**7µm PDMS 10 min headspace**	**GC-MS**
611	**Flavor compounds in oatmeal**	**Contribution of volatiles to the flavor of oatmeal J. Sci Food Agric.1/15/2000, 80(2);, 247-254 Zhou, M, Robards, K., Helliwell, S., Glennie-Hommes, M.**	**100µm PDMS water solution @ 100°C headspace**	**GC-MS**
309	Flavors in food products	SPME for the Analysis of Flavors Techniques for Analyzing Food Aroma, pp81-112, Food Sci. Technol., New York (1997) Harmon, A.	various fibers & conditions	
388	Volatiles in consumer products	Analysis of Volatile Fragrance and Flavor Compounds by Headspace SPME Combined with Gas Chromatography/ Mass Spectrometry J. Chem. Educ. 1999, 76(2), 245-248 Galipo, R., Canhoto, A., Walla, M., Morgan, S.	100µm PDMS 30 min headspace	GC-MS
454	Organic content in alcoholic beverage	Research on alcoholic beverages at Alko's control Lab Kem.-Kemi, 1999, 26(2), 95-97 Lehtonen, P.	Finnish	GC-MS
455	Alcohols, esters, free fatty acids in Sake	Analysis of free fatty acids, higher alcohols and esters in sake by headspace-SPME Nippon Jozo Kyokaishi (1999), 94(3), 252-257 Utsunomiya, H.	Japanese	
312	Flavor volatiles in malt beverages	Headspace Gas Chromatography Profiles of Fruit-Flavored Malt Beverages, Using SPME J. Am. Soc. Brew. Chem. 55 (3): 112-118 (1997) Constant, M., Collier, J.	100µm PDMS 45°C, 45-60 min headspace	GD-FID

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
313	Alcohols, esters in beer	Solid Phase Microextraction for the Analysis of Some Alcohols and Esters in Beer: Comparison with Static Headspace Method J. Agric. Food Chem. 46 (4): 1469-1473 (1998) Wasowicz, E., Kaminski, E., Jelen, H., Wlazly, K.	85µm polyacrylate 50°C, 30 min headspace salt added	GC-FID
456	Dimethyl sulfide in beer	Headspace SPME for the analysis of dimethyl sulfide from beer J. Agric. Food Chem. 1999, 47(7), 2505-2508 Scarlata, C. Ebeler, S.	65µm Carboxen/PDMS 15 min @ 30°C headspace 1.5gm NaCl	GC-FPD
612	**Volatiles in whiskeys**	**Characterization of whiskeys using SPME with GC-MS J.Chromatogr. A (2000) 896, 351 Fitzgerald, G., James, K., MacNamara, K., Stack, M.**	**85µm polyacrylate 35 min headspace**	**GC-MS**
595	Aroma volatiles in Brandy	Changes in odor of Bartlett pear brandy influenced by sunlight irradiation. Chemosphere. Mar 1999; 38(6): 1299-1303 Kralj-Cigic,-I; Zupancic-Kralj,-L	100µm PDMS 15 min @ 40°C	GC-EIMS
613	**Aroma compounds in brandy**	**Analysis of brandy aroma by SPME and liquid-liquid extraction J. Sci. Food Agric. Apr 2000, 80(5), 625-630 Ebeler, S., Terrien, M., Butzka, C.**	**100µm PDMS 30 min @ 50°C Headspace**	**GC-FID**
135	Aroma volatiles in wine	Systematic Optimization of the Analysis of Wine Bouquet Components by SPME J. High Res. Chromatogr. 19: 258 (1996) Garcia, D., Magnaghi, S., Danzer, K.	85µm polyacrylate 15 min immersion, stirring pH 4, salt added	GC-FID
201	Procymidone residue in wine	Comparison of Two Recent Solventless Methods for the Determination of Procymidone Residues in Wines: Solid-Phase Microextraction-GC-MS and ELISA Tests J. Agric. Food Chem. 45: 1519-1522 (1997) Urruty, L., Montury, M., Braci, M., Fournier, J., Dournel, J.	100µm PDMS 30 min immersion stirring	GC-MS
314	Aroma volatiles in wine	Investigation of Wine Bouquet Components by SPME-Capillary GC, Using Different Fibers J. High Resolut. Chromatogr. 20 (12): 665-668 (1997) De La Calle Garcia, D., Feller, K., Reichbacher, M., Danzer, K., Hurlbeck, C., Bartzech, C.	85µm polyacrylate 30 min immersion stirring	GC-FID
428	Aroma volatiles in wine	Analysis of Wine Bouquet Components Using Headspace SPME-Capillary Gas Chromatography J. High Resolut. Chromatogr. (1998), 21(7), 368-373 De La Calle Garcia, D., Feller, K., Reichbacher, M., Danzer, K., Hurlbeck, C., Bartzech, C.	85µm polyacrylate 60 min headspace stirring salt added	GC-MS
94	Trichloroanisole in wine	Analysis of Cork Taint in Wine and Cork Material at Olfactory Sub-Threshold Levels by SPME J. Agric. Food Chem. 45: 1995-1997 (1997) Fisher, C., Fischer, U.	100µm PDMS 20°C, 30 min salt added	SIM-GC-MS
385	Trichloroanisole in wine	Detection of Cork Taint in Wine Using Automated SPME in Combination with GC-MS-SIM Book chapter 15: ACS Symposium Series 1999, Oxford University Press, "Flavor Analysis Development in Isolation and Characterization" Butzke, C., Evans, T., Ebeler, S.	100µm PDMS, 85µm polyacrylate 45°C, 25 min headspace	GC-MS-SIM
377	Sulfides, disulfides in wine	Headspace SPME Analysis of Volatile Sulfides and Disulfides in Wine Aroma J. Chromatogr. A 808 (1998) 211-218 Mestres, M., Busto, O., Guasch, J.	100µm PDMS, 85µm polyacrylate 30°C, 15 min, salt headspace	GC-FPD

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
406	Sulfides, disulfides in wine	Headspace SPME of Sulfides and Disulfides Using Carboxen/PDMS Fibers in the Analysis of Wine Aroma J. Chromatogr. A, 835 (1999) 137-144 Mestres, M., Sala, C., Marit, M., Busto, O., Guasch, J.	75µm Carboxen/PDMS 25°C, 30 min headspace stirring, salt added	GC-FPD
614	**Benzothiazoles in wine**	**Analysis of benzothiazole in Italian wines using SPME-GC-MS** **J. Agric. Food Chem. (2000), 48(4), 1239-1242** **Bellavia, V., Natangelo, M., Fanelli, R., Rotilio, D.**	**headspace**	**GC-MS**
363	Aroma volatiles in wine	Similarities in the Aroma Chemistry of Gewurztraminer Variety of Wines and Lychee (Litchi chinesis Sonn.) Fruit J. Agri. Food Chem. 1999, 47, 665-670 Ong, P., Acrees, T.	100µm PDMS 15 min headspace	GC-MS
427	Volatiles in wine	Fast Screening Method for Wine Headspace Compounds Using SPME and Capillary GC Technique Am. J. Enol. Vitic. (1998), 49(1), 100-104 Vas, G., Koteleky, K., Farkas, M., Ddobo, A., Vekey, K.	headspace	
397	Aroma volatiles in wine	Determination of Volatile Aroma Compounds of Blaufrankisch Wines Extracted by SPME J. Chromatographic Sci., Vol. 36, Oct. 1998, 505-510 Vas, G., Gal, L., Harangi, J., Dobo, A., Vekey, K.	100µm PDMS 10 min (headspace) 1 hr (immersion)	GC-MS
457	Flavor volatiles in wine	Classification of wine samples according to origin and grape varieties on the basis of inorganic and organic trace analysis Am. Laboratory, Oct. 1999, Vol. 31, No. 20, 26-34 Danzier, K, DeLaCalle Garcia, D, Thiel, G., Reichenbacher, M	85µm polyacrylate 60-90 min headspace Satr.salt	GC-FID
458	Aroma volatiles in wine	Examination of aroma production kinetics of different commercial wine yeast in fermenting muscat ottonel wines with the help of SPME headspace sampling and fast GC analysis Acta Aliment, (1999), 28(2), 133-140 Vaes, W., Blechschmidt, I., Kovacs, T., Vekey, K.	100µm PDMS 10 min headspace	GC-FID
582	Aroma volatiles in wine	Improvement of the chemometric variety characterization of wines by improving the detection limit for aroma compound J-High-Resolut-Chromatogr. Jun 1999; 22(6): 322-326 Weber,-J; Beeg,-M; Bartzsch,-C; Feller,-K-H; De-la-Calle-Garcia,-D; Reichenbaecher,-M; Danzer,-M	85µm polyacrylate 3 hr. , headspace NaCl added	GC-EMIS
459	Aroma volatiles in wine	Determination of volatiles from red wines made by carbonic maceration using SPME technique Acta Aliment, 1999, 28(1), 95-101 Vas, G., Loerincz, G.	100µm PDMS 10 min headspace	GC-EIMS
559	Aroma volatiles from toasted oak	Monitoring Toasting Intensity of Barrels by Chromatographic Analysis of Volatile compounds from Toasted Oak Wood J. Agric. Food Chem, 1999, 47, 4310-4318 Chatonnet, P., Cutzach, I., Pons, M., Dubourdieu, D.	100µm PDMS 30 min @ 22°C headspace	GC-FID
460	Polyphenolics in red wine	Assembly tests of "Nero d'Avola" with wines derived from an allocthonous cultivar: study of polyphenolic and aromatic profiles. Ind. Bevande (1999), 28(160), 119-126 Papucci, A, Monte, L., D'Agostino, S, Aozzino, P., Avellone, G	headspace Italian	GC-MS

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
315	Styrene in wine	Determination of Styrene in Wine by SPME and GC-MS Mitt. Klosterneuburg 47 (4): 117-123 (1997) Flak, W., Tscheik, G.		GC-MS
311	Methylisocyanate in wine	SPME Analysis of Methyl Isothiocyanate in Wine J. Agric. Food Chem. 45 (8): 3092-3094 (1997) Gandini, N., Riguzzi, R.	65µm Carbowax/DVB 30 min headspace salt added	GC-FID, NPD
366	Diacetyl in wine	Analysis of Diacetyl in Wine Using SPME -GC-MS J. Agric Food Chem. 1999, 47, 612-617 Hayasaka, Y., Bartowsky, E.	60µm Carbowax/DVB 24°C, 5 min headspace salt added	GC-MS
316	Pesticides in Wine	Determination of Pesticide Residues in Wine by SPME and GC/MS for Consumer Risk Assessment Food Addit. Contam. 15 (3): 280-287 (1998) Vitali, M., Guidotti, M., Giovinazao, R., Cendrone, O.		GC-MS
615	**Pesticide residue on vegetables**	**Applications of SPME to the Analysis of Pesticide Residues in Vegetables Pest. Manag Sci 56: 618-636 (2000) Volante, M.,Pontello, M., Volante, L. Cattaneo, M., Bianchi, M., Bianchi, M., Colzani, L.**	**100µm PDMS, 60µm Carbowax/DVB 50 min**	**GC-ECD GC-NPD**
432	Pesticides in food	Some Applications of SPME in the Analysis of Pesticide Residues in Food J. Environ. Sci. Health, Part B (1998), B33 (3), 279-292 Volante, M.,Cattaneo, M., Bianchi, M., Zoccola, G.		
461	Pesticides on strawberries	SPME of pesticide residues from strawberries Food Addit. Contam. (1999), 16(3), 111-117 Hut, R., Henniont, B., Urrutyt, L., Monturyt, M.	10µm PDMS 45 min @ 25°C	
462	Organophosphorus pesticides in fruit/fruit juices	Validation of a SPME method for the determination of organophosphorus pesticides in fruits and fruit juice J. Chromatogr. A (1999), 833(1), 35-42 Simplicio, A, Vilas Boas, L.	100µm PDMS 3 min immersed	GC-FPD
463	Organochlorine & organophosphorus in water/ethanol	A Systematic Approach to Optimize SPME determination of Pesticides in Ethanol/Water mixtures used as Food Simulates Anal. Chem. (1999), 71(13), 2417-2422 Batlle, R, Sanchez, C., Nerin, C.		
616	**Volatiles in water**	**Evidence for selectivity of absorption of volatile organics compounds by PDMS SPME fiber J. Chromatogr. A,(2000) 885, 457-464 Niedziella, S., Rudkin, S., Cooke, M.**	**30µm PDMS headspace**	
317	Aroma volatiles in water traps	Analysis of Aroma Release During Microwave Heating J. Agric. Food Chem. 45 (11): 4388-4392 (1997) Roberts, D., Pollien, R.	60µm Carbowax/DVB 10 min immersion, stirring	GC-FID
435	Aroma volatiles in food products	SPME Associated with Microwave Assisted Extraction of Food Products J. High Resolut. Chromatogr. (1997), 20(4), 213-216 Wang, Y., Bonilla, M., McNari, H., Khaled, M.		
318	N-nitrosamines in smoked hams	Rapid Semi-Quantitative Estimation of N-Nitrosodibulylamine and N-Nitrosodibenzylamine in Smoked Hams by SPME Followed by GC-Thermal Energy Analysis J. Chromatogr. A 788(1+2): 131-140 (1997) Sen, N., Seaman, S., Page, B.	85µm polyacrylate 10 min headspace stirring salt added	GC-thermal energy or MS

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
348	Flavor volatiles in beef	Application of SPME to the Analysis of Warmed Over Flavor in Beef Poster Paper, IFT 1999 Gruen, I., Fernando, L., Mobley, S.	100µm PDMS 35°C, 10 min headspace	GC-MS
617	**Aroma compounds in cooked pork**	**Two-fiber SPME combined with GC-MS for the analysis of volatile aroma compounds in cooked pork J. Chromatogr. A 905(2000), 233-240 Elmore, J. Mottram, D., Hierro, E.**	**Carboxen/PDMS. Carboxen/DVB/PDMS 30 min @ 60°C**	**GC-MS**
618	**Hexanal, pentanal in cooked turkey**	**A comparison of SPME fibers for measurement of hexanal and pentanal in cooked turkey Food Chem Feb. 2000, 68(3), 339-345 Brunton, N., Cronin, D, Durcan, R., Monahan, F.**	**Carboxen/DVB/PDMS 20 min, headspace @ 40°C**	**GC-FID**
423	Volatiles in meat	Comparison of Volatile Analysis of Lipid-Containing and Meat Matrices by SPME and SFE ACS Symp. Ser. (1998), 705 (Flavor Analysis), 107-115 Snyder, J., King, J., Zhang, Z.		
619	**Volatiles from salmonellas infected beef**	**SPME/GC of Salmonella-Infected Beef J Agric Food Chem, 2000, 48, 2253-2259 Ogihara, H., Horimoto, Y., Hai, Z., Skura, B., Nakai, S.**	**75µm Carboxen/PDMS 10 min**	**GC**
393	Volatiles from processed poultry	Use of Digital Aroma Technology and SPME GC-MS to compare Volatile compounds Produced by Bacteria isolated from Processed Poultry J. Sci. food Agric. 1998, 78, 343-348 Arnold, J., Senter, S.	100µm PDMS 30 min @ 37°C headspace stirred	GC-MS
253	Putrescine, cadaverine in borate buffer solution	An Electrodeposition Device for the Determination of Putrescine and Cadaverine by High-Resolution GC J. High Resolut. Chromatogr. 19 (5): 294-297 (1996) Conte, E., Miller, D.	carbon fibers 0-60 min, immersion stirring pH 8	HPLC (C18 column)
620	**Volatile bacteria metabolites in milk**	**Shelf-life prediction of processed milk by SPME -MS and multivariate analysis J. Agric Food chem (2000), 366(1), 106-111 Marsili, R.**	**75µm Carboxen/PDMS**	**GC-MS**
386	Oxidative byproducts in milk	Comparison of SPME and Dynamic Headspace Methods for the GC-MS Analysis of Lighted Induced Lipid Oxidation Products in Milk J. Chromatogr. Sci. 1999, 37, 17-23 Marsili, R.	75µm Carboxen/PDMS 45°C, 15 min headspace salt added	GC-MS
372	Off-flavors in milk	SPME-MS-MVA as an Electronic Nose for the Study of Off-Flavors in Milk J. Agric. Food Chem. 1999, 47, 648-654 Marsili, R.	75µm Carboxen/PDMS 45°C, 12 min headspace	GC-MS
621	**Chlorinated organics in breast milk**	**Application of SPME for the rapid analysis of chlorinated organics in breast milk Fresenius, J. Anal.Chem, Jan 2000, 366(1), 106-111 Rohrig, L., Meisch, H.**		**GC-ECD**
364	Off-flavors in food	Off Flavor and Malodors in Food: Mechanism of Formation and Analytical Techniques Book-Techniques for Analyzing Food Aroma, Marcel Decker ISBN: 0-8247-9788-4 Marsili, R.	various fibers and conditions	GC

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
376	Volatile metabolites in water	Evaluation of SPME for Analysis of Volatile Metabolites Produced by Staphylococci J. Agric. Food Chem. 1998, 46, 228-234 Vergnais, L., Masson, F., Montel, M., Berdague, J., Talon, R.	85µm polyacrylate 80°C, 15 min headspace, stirring	GC-FID
365	Volatiles in tea	Determination of Volatile Organic Compounds in Tea Industrie de la Bevande XXVI (1997) febbralo, 19-22 Guidotti, M.	100µm PDMS 50°C, 15 min headspace	GC-MS
622	**Polyphenols in green tea**	**Comparative Study and Partial characterization of Azorean green Tea Polyphenols** **J. Food Compos. Anal. (1999), 12(4), 273-287** **Baptista, J., da P Tavares, J., Carvalho, R.**		
319	Caffeine in tea, coffee	Quantitative Determination of Caffeine in Beverages, Using a Combined SPME-GC-MS Method J. Chem. Educ. 74 (9): 1130-1132 (1997) Yang, M., Orton, M., Pawliszyn, J.	bare fiber	GC-MS
381	Aroma volatiles in coffee	Characterization of Roasted Coffee and Coffee Beverages by SPME-GC and Principal Component Analysis J. Agric. Food Chem. 1997, 45: 4680-4686 Bicchi, C., Panero, O., Pellegrino, G., Vanni, A.	100µm PDMS, 7µm PDMS 60°C, 5 min headspace	GC-MS
302	Volatile aroma in brewed coffee	Obtention of a Brewed Coffee Aroma Extract by an Optimized Supercritical CO2-Based Process J. Agric. Food Chem. 1998, 46, 4011-4016 Ramos, E., Valero, E., Ibanez, E., Reglero, G., Tabera, J.	100µm PDMS 60°C, 10 min headspace	GC-MS
623	**Aroma volatiles in coffee**	**SPME Method Development for Headspace analysis of volatile flavor compounds** **J. Agri. Food Chem 2000, 48, (6) 2430-2437** **Roberts, D., Pollien, P., Milo, C.**	**PDMS/DVB** **60 min headspace** **pH 2**	**GC-MS**
624	**2-Acetyl-1-pyrroline in rice**	**Screening for 2-Acetyl-1-pyrroline in the Headspace of Rice using SPME/GC-MS** **J. Agric. Food Chem 2001, 49, 245-249** **Grimm, C, Bergman, jC., Delgado, J., Bryant, R.**	**Carboxen/DVB/PDMS** **80°C, 15 min** **headspace** **.75gm in 100µl H20**	**GC-MS**
464	2-MIB, geosmin in water	Microwave mediated distillation with SPME determination off-flavors, geosmin and methylisoborneol, in catfish tissue J. Chromatogr. A (1999), 833(2), 223-230 Zhu, M., Aviles, F., Conte, E., Miller, D., Perschbacher, P.	100µm PDMS 25 min immersed salt added	GC-MS
625	**2-MIB, geosmin in water**	**Microwave Distillation-SPME-GC Analysis of 2-methylisoboreneol and Geosmin in Catfish** **Am-Lab Feb 2000: 32(3), 40-48** **Lloyd, S., Grimm, C.**	**80µm Carboxen/DVB/PDMS** **60°C, 20 min**	**GC-IC-MS**
	2-MIB, geosmin in water	Analysis of 2-Methylisoboreneol and Geosmin in Catfish by Microwave Distillation-SPME J. Agri. Food Chem., 47, No. 1, pg. 164-169, 1999 Lloyd, S., Grimm, C.	100µm PDMS 40°C, 15 min saturated salt stirring	GC-MS
362	MIB & geosmin in water	Determination of Geosmin and 2-Methylisoboreneol in Water Using SPME and GC-Chemical Ionization/Electron Impact Ionization Ion Trap MS Analyst (Cambridge, U.K.) (1998), 123 (10), 2155-2160 McCallum, R., Pendleton, P., Scumann, R., Trinh, M.	Carboxen/DVB/PDMS 60°C, 30 min headspace stirring salt added	GC-MS

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
465	C2-C10 acid, aldehydes, phenols in swine manure	Evaluating Peats for their capacities to remove odorous compounds from liquid swine manure using headspace SPME J. Environ. Sci.Health, B34(4), 709-748 (1999) Rizzuti, A., Cohen, A., Hunt, P., Vanotti, M.	85µm polyacrylate 20 min @ 72°C headspace, pH 2	GC-MS

Polymers & Coatings

254	Degradation products in polymers	SPME as an Effective Means to Isolate Degradation Products in Polymers J. Environ. Polym. Degrad. 5 (2): 67-73 (1997) Hakkarainen, M., Karlsson, S., Albetsson, A.		
361	Volatile solvents in water-based coatings	Direct VOC Analysis of Water-Based Coating by GC and SPME J. Coating Technology, June 1997 Censullo, A., Jones, D., Wills, M.	65µm Carbowax/PDMS 5 min headspace salt added	GC-FID
626	**Volatile solvents in water-based coatings**	**Analysis of exempt paint solvents by GC using SPME J. Coat Technol. (2000), 72(900), 69-74 Bodrian, R., Censullo, A., Jones, D., Rashkin, M., Wills, M.**	**65µm Carbowax/PDMS 5 min headspace salt added**	**GC-FID**
466	Volatiles from varnished wire	Analysis of volatile varnishes of coated wires by SPME Fresenius' J. Anal. Chem. 1999, 364(7), 641-642 Hinz, D., Kwarteng-Acheampong, W., Wenclawiak, B.	headspace	GC-MS
426	Acetaldehyde in polyethylene bottles	Determination of Residual Acetaldehyde in Polyethylene Terephthalate Bottles on SPME Czech J. Food Sci. (1998), 36(8), 401-405 Cizkova, H., Voldrich, M., Dobias, J.		
467	Bisphenol A in plastic	Abbreviated analysis of bisphenol A with SPME in tableware and food containers Shigen Kankyo Taisaku, 1999, 35(5), 447-451 Takao, Y., Arizono, K.		
468	Residual solvents pharmaceutical samples	Headspace SPME method optimization for residual solvent analysis Acta pharm. Hung., 1999, 69(2), 77-84 Camarasu, C., Mezei, M., Szabo, A	65µm DVB/PDMS 30 min headspace 2gm NaCl,	

Natural Products

401	Volatiles in tobacco	Analysis of Tobacco Volatiles with SPME Dr. W.D. Koller, Federal Research Centre for Nutrition, Institute of Process Engineering, Engesserstr. 20, 76131 Karlsruhe/Deutschland	100µm PDMS 10 min headspace	GC-MS
402	Pesticides in water/MeOH extract	A Simple Screening for Pesticide Residues in Tobacco Dr. W.D. Koller, Federal Research Centre for Nutrition, Institute of Process Engineering, Engesserstr. 20, 76131 Karlsruhe/Deutschland	100µm PDMS 10 min immersion	GC-MS
102	Flavor additives in tobacco	Qualitative and Quantitative Analysis of Flavor Additives on Tobacco Products Using SPME-GC-MS J. Agric. Food Chem. 45: 844-849 (1997) Clark, J., Bunch, J.	65µm Carbowax/DVB 95°C, 15 min KCl added	GC-FID
430	Alkaloids in tobacco	Determination of Tobacco Alkaloids Using SPME and GC-NPD Chromatographia (1998), 47(7/8), 443-448 Yang, S., Smetena, I.	100µm PDMS 12 min, immersed 1% NH3OH solution	GC-NPD

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
627	**Acetates in cigarette tobacco**	**Quantitative analysis of acetates in cigarette tobacco using SPME-GC-MS J. Chromatogr. Sci (2000), 38(4), 137-144 Watson, C., Ashley, D.**	**headspace**	**GC-MS**
137	Phenols in cigarette smoke	Quantitative Determination of Phenols in Mainstream Smoke with SPME-GC-Selected Ion Monitoring Mass Spectrometry J. Chromatogr. Sci. 34: 272-275 (1996) Clark, J., Bunch, J.	85µm polyacrylate 60 min stirring	GC-FID
628	**Azo dyes in leather & textiles**	**Study on determination of prohibited azo dyes by SPME Fenxi Deshi Xuebao (2000), 19(1), 76-78 Xu, H., Tong, H.**	**reduced to aromatic amines w/Na2SO4**	**GC-MS**
210	Solvents in water-based coatings	Derivatization Solid-Phase Microextraction Gas Chromatographic Mass Spectrometric Determination of Organic Acids in Tobacco J. Chromatogr. Sci. 35 (5): 209-212 (1997) Clark, T., Bunch, J.	65µm Carbowax/DVB 5 min headspace stirring salt added	GC-FID
72	Monoterpenes in conifer needles	Analysis of Monoterpenes from Conifer Needles Using SPME J. High Res. Chromatogr. 18: 587-592 (1995) Schafer, B., Hennig, P., Engewald, W.	100µm PDMS 40°C, 5 min headspace	GC-FID
399	Monoterpenes in conifer needles	Changes in the Flavor of Monoterpenes During Their Autoxidation Under Storage Conditions Dept. of Food Chemistry, Prague Institute of Chemical Technology, Technicka 5, CZ-16628 Prague 6, Czechia Pokorny, J., Pudil, F., Volfova, J., Valentova, H.	65µm Carbowax/DVB 40°C, 10 min headspace	GC-MS
159	Terpenoids in herbs	Head-Space SPME for the GC-MS Analysis of Terpenoid in Herb-Base Formulations Fresenius' J. Anal. Chem. 356: 80 (1996) Czerwinski, J., Zygmunt, B., Namiensnik, J.		GC-MS
629	**Terpenoids in plant materials**	**SPME of Volatile Components from Natural Grassland Plants J. Agric.Food Chem. 2001, 49, 203-209 Cornuk, A., Carnat, A., Martin, B., Coulon, J., Lamaison, J., Berdague,J**	**100µm PDMS 15 min @ 44°C headspace, 1 gm in 40ml vial**	**GC-MSD**
320	Terpenoids in herbs	Head Space SPME for the GC-MS Analysis of Terpenoids in Herb-Based Formulations J. Anal. Chem. 356 (1): 80-83 (1996) Czerwinski, J., Zygmunt, B., Namiesnik, J.		GC-MS
630	**Monoterpens in essential oils**	**Examination of the enatomeric distribution of certain monoterpene hydrocarbons in selected essential oils by automated SPME-chiral GC -Mass spectrometry. J. Chromatogr. Sci., Mar.2000, 38(3), 95-99 Coleman, W., Lawrence, B.**	**6 se. headspace**	**GC-MS**
631	**Monoterpens & essential oils in peppermint**	**Monoterpene composition essential oil from peppermint (Mentah x piperita L.) w/regard to Leaf position using SPME and GC-MS Analysis J.Agric. Food Chem 1999, 3782-3786**	**100um PDMS 1 min @ 25°C headspace**	**GC-MS**
632	**Monoterpens & essential oils in mint plant**	**Biogenesis study of essential oils by SPME enatio-multidimensional GC-MS (MDGC/MS) GIT Lbor-Gachz (2000), 44(4), 358-362 Fuchs, S., Beck, T., Mosandl, A.**		**GC-MS**

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
633	**Essential oils in quava fruit**	**Chemical composition of the essential oil and headspace SPME of the quava fruit J. Essent. Oil Res (2000), 12(2), 153-158 Paniandy, J., Chane-Ming, J., Pieribattesti, J.**	**headspace**	**GC-MS**
469	Essential oils from aromatic plants	Rapid GC with resistance heated capillary columns. Analysis of essential oils from aromatic plants Git Spez. Sep. (1999), 19(1), 40-43 Theuerl, T., Kleibohmer,W., Blanke, R.		
389	Cuticular hydrocarbons in Dinoponera quadriceps ants	Solid Phase Microextraction and Cuticular Hydrocarbon Differences Related to Reproductive Activity in the Queenless Ant J. Chemical Ecology, 24: 473-490, 1998 Monnin, T., Malosse, C., Peeters, C.		GC-MS
89	Pheromones in insects	Solid Phase Microextraction, an Alternative Method for the Study of Airborne Insect Pheromones (Metamasius hemipterus, Coleoptera, Curculionidae) J. High Res. Chromatogr. 18: 669-670 (1995) Malosse, C., Ramirez-Luca, P., Rochat, D., Morin, J.	100µm PDMS 5 min headspace	GC-FID
634	**Pheromones of Rhinoceros beetles**	**Role of SPME in the identification of highly volatile Pheromones of two Rhinoceros beetles Scapanes australis and Strategus aloeus (Coleoptera, Scarabaeidae, Dynastinae) J Chromatogr. A, 885 (2000) 433-444, Rochat, D, Ramirez-Lucas,P., Malosse,C., Aldana,R. Kakul,T. Morin,J**	**Carboxen/PDMS 2 min**	**GC-MS**
635	**Volatiles in insecticide**	**The measurement of volatile compounds in Foray 48B, an insecticide prepared from Bacillus thuringiensis var. kurstaki Sci. Total Env., (2000) Vol. 263, No. 1-3, 155-160 van Netten, C., Bartlett, K., Chow, Y., Leung, V., Teschke, K.**		
434	Pheromones in insects	SPME, A New Tool in Pheromone Identification in Lipidoptera J High Resolut. Chromtogr. (1997), 20(6), 340-342 Frerot, B., Malosse, C., Cain, A.	7µm PDMS 5 min rubbed on fiber	GC-FID or GC-FTD
120	NH3, putrescine, methylamine in lure cultures	Solid Phase Microextraction Analysis of Static-Air Emissions of Ammonia, Methylamine, and Putrescine from a Lure for the Mexican Fruit Fly J. Agric. Food Chem. 44: 3554-3559 (1996) Robacker, D., Bartelt, R.	100µm PDMS 10 min headspace	FID
398	Chemical attractants in soy broth culture	Chemicals Attractive to Mexican Fruit Fly from Klebsiella pneumonia and Citrobacter freundii Cultures Sampled by SPME J. Chemical Ecology, Vol. 23, No., 12, 1997, 2897-2915 Robacker, D., Bartelt, R.	100µm PDMS 27°C, 30 min headspace	GC-MS
470	Pheromones	Pheromone analysis using capillary GC techniques J. Chromatogr., A 1999, 843(1+2), 199-236 Jones, G., Oldham, N.	review of use of SPME	GC
124	Pheromones in insects	Solid Phase Microextraction Technique Used for Collecting Semiochemicals, Identification of Volatiles Released by Individual Signaling Phylionorycter sylvella Moths Z. Nturforsch. C: Giosci. 51: 599 (1996) Karlson-Borg, A., Mozuaitis, R.	100µm PDMS 1-3 hr headspace	GC-MS
410	Pheromones in elephant urine	Purification, Identification, Concentration and Bioactivity of (Z)-7-dodecen-1-yl acetate: Sex Pheromone of the Female Asian Elephant, Elephas maximus Chem. Senses 22: 417-437 Rasmussen, L.E.L., Lee, T.D., Zhang, A., Roelofs, W.L., and Daves Jr., G.D.		GC-MS

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
394	Free fatty acids in exocrine secretions	Sampling Techniques for GC-MS Analysis of Long-Chain Free Fatty Acids from Insect Exocrine Glands J. Chromatogr. A 816 (1998) 169-175 Maile, R., Dani, F., Jones, G., Morgan, D., Orthius, D.	100µm PDMS, 65µm Carbowax/DVB 140°C, 30 min headspace	GC-MS
382	Volatile attractants in cultures	Attractants from Stryphylococcus aureus Cultures from Mexican Fruit Fly, Anastrepha ludens J. Chemical Ecology, Vol. 21, No. 11, 1861-1874 (1995) Robacker, D., Flath, R.	100µm PDMS 5 min - 24 hr headspace	GC-MS
471	Volatile attractants in bracket fungi	Volatiles of bracket fungi Fomtopsis pinicola and Fomes fomentarius and their functions as insect attractants J. Chem. Ecol. (1999), 25(3), 567-590 Faldt, J., Jonsell, M., Norlander, G., Borg-Karlson, A.		GC-MS
584	Alcholols, aldehydes in air	Volatiles from Fusarium verticillioides (Sacc.) Nirenb. and their attractiveness to Nitidulid beetles. J-Agric-Food-Chem. Jun 1999; 47(6): 2447-2454 Bartelt,-RJ; Wicklow,-DT	100µm PDMS 30 min	GC-FID/MS
472	Volatile attractants from apples	Identification of a new blend of apple volatiles attractive to the apple maggot, Rhagoletis pomonella J. Chem. Ecol., 1999, 25(6), 1221-1232 Zhang, A., Linn, C., Wright, S., Prokopy, R. Reissig, W., Roelogs, W.		GC-FID
636	**Pyrazine in Must**	**Headspace SPME method for determining 3-akyl-2 methoxy-pyrazine in musts by PDMS fibers J Chromatogr. Sci (2000), 880(1+2), 93-99 Sala, C., Mestres, M, Marit, M., Busto, O., Guasch, J.**	100µm PDMS **headspace**	**GC-NPD**
211	Musk compounds in cosmetic products	Nitro Musks in Cosmetic Products: Determination by Headspace SPME and Gas Chromatography with Atomic-Emission Detection Chromatographia 45: 138-144 (1997) Struppe, C., Schaefer, B., Engewald, W.	100µm PDMS 80°C, 30 min headspace	GC-AED
637	**Volatiles in Gardenia flower**	**Analysis of headspace constituents of Gardenia flower by GC-MS with SPME and dynamic headspace sampling Sepu, (2000-09) 18(5) 425-455 Liu, B., Gao, Y.**	**100µm PDMS 60 min @ 28°C headspace**	**GC-MS**
125	Fragrance in flowers	IFF Announces New Method for Living Flower Analysis Spray Technology & Marketing Oct. 1996, pp 26-30 Anon	75µm Carboxen/PDMS headspace	GC-MS
126	Fragrance in flowers	Flavors of Heliotrope Flowers, Analyzed by SPME Method Gakkaishi 2: 6 (1995) Nippon, Shokuhin Kagaku		GC-MS
746		**Influence of fiber coating in headspace SPME-GC analysis of aromatic and medicinal plants J.Chromatogr. A (2000) 892, 469**		
465	C2-C10 Acid, phenols, aldehydes in swine manure	Evaluating Peats for their capacities to remove odorous compounds from liquid swine manure using headspace SPME J. Environ. Sci.Health, B34(4), 709-748 (1999) Rizzuti, A., Cohen, A., Hunt, P., Vanotti, M.	85µm Polyacrylate 20 min @ 72°C headspace, pH 2	GC-MS
127	Cinnamon	Classification of the Botanical Origin of Cinnamon by SPME-GC Chromatographia 42: 2187 (1996) Miller, K,. Poole, C., Pawlowski, T.		

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
321	Epicuticular hydrocarbons in insect culture	SPME of Insect Epicuticular Hydrocarbons for GC-MS Analysis Rapid Commun. Mass Spectrom. 11 (8): 857-862 (1997) Moneti, G., Dani, F., Pieraccini, G., Turillazzi, S.		GC-MS
Pharmaceutical				
147	Volatiles in biological fluids	Application of Head-Space SPME for the Analysis of Volatile Metabolites J. Microbiol. Methods 25: 245 (1996) Milsson, T., Larsen, T., Montanarella, L., Madsen, J.		GC-MS
338	Solvents in pharmaceutical products	Determination of Residual Solvents in Pharmaceuticals with Automated SPME Chem. N. Z. 61 (4): 10-12 (1997) Penton, Z.	100µm PDMS 15 min headspace	GC-FID
149	Components in drugs	Analysis of Components in Crude Drugs by Headspace SPME Method Zasshi 16: 251 (1996) Yakugaku		
473	Residual solvents pharmaceutical samples	Headspace SPME method optimization for residual solvent analysis Acta pharm. Hung., 1999, 69(2), 77-84 Camarasu, C., Mezei, M., Szabo, A	65µm DVB/PDMS 30 min headspace 2gm NaCl,	GC
Biological				
638	**Proteins in plasma**	**Evaluation of SPME for the study of protein binding in human plasma samples** **J. Chromatogr. Sci. (2000), 38(10), 458** **Abdel-Rehim, M., Calsson, G., Bielenstein, M., Arvidsson, T., Blomberg, L.**		
99	Aniline, nitrobenzene, 4-n-pentylphenol, 4-chloro-3-methylphenol in bovine serum albumin	Measurement of the Free Concentration Using SPME: Binding to Protein J. Anal. Chem. 68: 4463-4467 (1996) Vaes, W., Ramos, E., Verhaar, H., Seinen, W., Hermens, J.	85µm polyacrylate 24°C, 9-14 min stirring K2PO4 buffered	GC-MS
140	Protein in bovine serum albumin	Solid Phase Microextraction of Biopolymers, Exemplified with Adsorption of Basic Proteins onto a Fiber Coated with Polyacrylic Acid J. Microcolumn Sep. 8: 1 (1996) Liao, J., Zeng, C., Hjerten, S., Pawliszyn, J.	85µm polyacrylate 5-240 sec immersion	HPLC-UV
411	Proteins	Optimization of SPME-Capillary Zone Electrophoresis-MS for High Sensitivity Protein Identification Electrophoresis (1998), 19(13), 2338-2347 Figeys, D., Ahang, Y., Aebersold, R.		capillary zone electrophoresis-MS
Toxicology				
639	**Drugs**	**Microextraction of drugs** **J. Chromatogr.,A, 902(2000) 17-63** **Lord, H., Pawliszyn, J.**	**review article**	
640	**Drugs in body fluids**	**Solid phase microextraction in biomedical analysis** **J. Chromatogr.,A, 902(2000) 167-194** **S. Ulrich**	**review article**	
641	**Volatile, semivolatiles in biological fluids**	**Headspace SPME procedures for gas chromatographic analysis of biological fluids and materials.** **J. Chromatogr.,A, 902(2000) 267-287** **Mills, G., Walker, V.**	**review article**	**GC**

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
642	**Hydrocarbon mixture in water**	**Accessing the aquatic toxicity of complex hydrocarbons mixtures using SPME Toxicol. Lett. 2000, 112-1113, 273-282 Parkerton, T, Sone, M., Letiski, D.**		
643	**Methadone in saliva**	**SPME in the determination of methadone in human saliva by GC-MS J. Anal Toxicol (2000), 24(2), 93-96 Dos Santos Lucas, A., Bermejo, A., Fernandez, P., Tabernero, M**	**100µm PDMS 30 min**	
29	Methadone in urine	Gas Chromatographic Analysis of Methadone in Urine Samples after Solid Phase Microextraction J. Microcolumn Sep. 6: 577-581 (1994) Chiarotti, M., Marsili, R.	100µm PDMS 15 min immersion pH 7.7	GC-MS
644	**Methadone, EDDP in human hair**	**Use of SPME for the determination of methadone and EDDP in human hair by GC-MS Forensic Sci. Int (2000) 107(1-3), 225-232 Luca, A., Bermejo, A., Tabernero, M., Fernadez, P., Strano-Rossi, S.**	**100µm PDMS 30 min, immersed**	**GC-MS**
563	Methadone, EDDP in plasma	Use of SPME for the determination of Methadone and its main metabolite, EDDP, in plasma by GC-MS J. Anal. Toxicol. 24, 66-69 (2000) Bermejo, A., Seara, R., dos Santos Lucas, A., Tabernero, M., Fernandez, P., Marsili, R.	100µm PDMS 30 min immersion 1:4 delution @ pH 9	GC-MS
474	Anorectics in urine	SPME and GC analysis of anorectic compounds in human urine J.Microcolumn Sep. 1997, ((4), 249-252 Chiarotti, M. Strano-Rossi, S., Marsili, R.		GC-MS
645	**Tetramine in blood**	**Rapid detection of tetramethylenedisulfotertramine in human blood by SPME-GC Anal. Chim. Acta (2000), 404(2), 329-334 Luan, T., Li, G., Zhao, M., Zhang, Z.**	**100µm PDMS**	**GC-FPD**
65	Anesthetics in human blood	Detection of Ten Local Anesthetics in Human Blood Using Solid Phase Microextraction and Gas Chromatography Jpn. J. Forensic Toxicol. 13 (2): 182-188 (1995) Kumazawa, T., Lee, X., Sato, K., Seno, H., Ishii, A., Suzuki, D.	100µm PDMS 100°C, 40 min headspace perchloric acid added	GC-FID
144	Anesthetics in blood	Extraction of Local Anesthetics from Human Blood by Direct Immersion-SPME Chromatographia 43: 59-62 (1996) Kumazawa, T., Sato, K., Seno, H., Ishii, A., Suzuki, O.	100µm PDMS 40 min immersion stirring salt added	GC-FID
342	Anesthetics in human blood	Simple Analysis of Local Anesthetics in Human Blood Using Headspace SPME and GC-MS-Electron Impact Ionization Selected Ion Monitoring J. Chromatog. B, 709 (1998), 225-232 Watanabe, T., Namera, A., Yaskiki, M., Iwasaki, Y., Kojima, T.	100µm PDMS 120°C, 45 min headspace NaOH added	GC-MS
475	Nereistoxin in human serum	Simple and Sensitive Analysis of Nereistoxin and its Metabolites in Human Serum using Headspace SPME-GC-MS J. Chromatographic Science 37(3):77-82(1999) Namera,A., Watabe,T., Yashiki,Y., Kojima,T., Urabe,T.	65µm DVB/PDMS 30 min @ 70°C NaCl added, headspace	GC-MS

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
419	Lidocaine in urine	Direct SPME Combined with Gas and Liquid Chromatography for the Determination of Lidocaine in Human Urine Chromatographia (1998), 47(11/12), 678-684 Koster, E., Hofman, N., DeJong, G .		GC, HPLC
646	**Lidocaine in plasma**	**Determination of lidocaine in plasma by direct SPME combined with GC J. Chromatogr., B. Biomed Sci. Appl (2000), 739(1), 175-182 Koster, E., Wemes, C., Morsink, J., deJong, G.**	**65µm PDMS/DVB 10 min immersed salt added**	**GC**
647	**Lidocaine in plasma**	**Evaluation of SPME in combination with GC as a tool for quantitative bioanalysis J. Microcolumn Sep. 2000, 12(5), 308-315 Abdel-Rehim, M., Bielenstein, M, Arvidsson, T.**	**Carbowax-DVB pH 9**	**GC-NPD**
420	Organochlorine compounds in blood	Determination of Persistent Organochlorine Compounds in Blood by SPME Extraction and GC-ECD Fresenius' J. Anal. Chem. (1998), 361(2), 192-196 Roehrig, L., Puettmann, M., Meisch, H.		GC-ECD
141	Chloroethers in biological samples	Determination of Chloroethenes in Environmental Biological Samples Using GC Coupled with SPME Chromatographia 42: 313 (1996) Xu, N., Vandegrift, S., Sewe, G.		
67	Solvent thinners in urine, blood	Simple Analysis of 5 Thinner Components in Human-Body Fluids by Headspace SPME J. Legal Medicine 107: 310-313 (1995) Lee, X., Kumazawa, T., Sato, K.	100µm PDMS 80°C, 5 min headspace	GC-FID
648	**Volatile organics in blood**	**Determination of volatile organic compounds in blood by headspace SPME-GC Weosjemg Uamkoi 2000, 29(1), 37-39 Hao, S., Kang, J., Zhou, S, Cui, J., Qi, Q., Han, K.**	**100µm PDMS 10 min**	**GC-FID**
649	**Volatile organics in blood**	**The use of SPME in conjunction with benchtop quadropole MS for the analysis of volatile organic compounds in human blood at low ppt. Levels J. Chromatogr. Sci. (2000), 38(2), 49-54 Cardinali, F., Ashley, D., Wooten, J., McCraw, J., Lemire, S.**	**100µm PDMS 10 min, headspace**	**GC-MS**
146	HydrocarbonsC9-C20 in blood	Analysis of Inflammable Substances in Blood Using Chemical Ionization Selected Ion Monitoring Jpn. J. Forensic Toxicol. 13 (2): 189 (1995) Iwasaki, Y., Yahiki, M., Nagsawa, N., Kojima, T., Miyazaki, T.	100µm PDMS NaOH added headspace	GC-MS
476	Flammables blood, urine	Analysis Method of Flammables in Blood by using headspace- SPME and Chemical ionized MS Detection Jpn. J. Legal. Med (49 Append): 80(1995) Iwasaki,Y., Yashiki,M., Nagasawa,N., Miyazaki,T., Kojima,T	100µm PDMS 10 min @ 90°C headspace	GC-MS
195	Cresol, phenols in human blood	Detection of Cresol Isomers and Phenol in Human Whole Blood by Headspace SPME and Capillary GC Jpn. J. Forensic Toxicol. 15 (1): 21-28 (1996) Lee, X., Kumazawa, T., Furuta, S., Kurosawa, T., Akiya, K., Skiya, I., Sato, K.	85µm polyacrylate 30 min @ 100°C NaCl added headspace	GC-FID
420	Chlorophenols in urine	Application of SPME and GC-MS for the Determination of Chlorophenols in Urine J. Chromatogr. B: Biomed. Sci. Appl. (1998), 707(1+2), 91-97 Lee, M., Yeh, Y., Hsiang, W., Chen, C.	85um polyacrylate 50 min, immersed pH 1	GC-MS

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
583	4-Chlorophenol in urine	Total 4-chlorophenol determination in urine samples of subjects exposed to chlorobenzene, using SPME and GC-MS. J-High-Resolut-Chromatogr. Jul 1999; 22(7): 427-428 Guidotti,-M; Ravaioli,-G; Vitali,-M	85µm polyacrylate 30 min salt added	GC-MS
477	PCBs in human serum	Determination of PCBs in human blood serum by SPME Cheosphere, 1999, 39(6), 905-912 Poon, K., Lam, P., Lam, M.		GC-ECD
68	Valproic acid in human plasma	Solid Phase Microextraction for the Determination of the Free Concentration of Valproic Acid in Human Plasma by Capillary GC J. Chromatogr. B 673: 299-305 (1995) Krogh, M., Johansen, K., Gonnesen, F., Rasmussen, K.	100µm PDMS 3 min immersion pH 2	GC-FID
69	Nicotine, cotinine in urine	Rapid Analysis of Nicotine and Cotinine in Urine Using Head Space Solid Phase Microextraction and Selected Ion Monitoring Jpn. J. Forensic Toxicol. 13 (1): 17-24 (1995) Yashiki, N., Magasawa, T., Kojima, T., Miyazaki, T., Iwasaki, Y.	100µm PDMS 80°C, 5 min headspace	GC-MS
478	Cartap in human serum	Simple Analysis of Cartap and Its Metabolites Using Solid Phase Microextraction and GC/MS Jpn. J. Forensic Toxicol. 16(2):142-143(1998) Namera,A., Watanabe,T., Yashiki,M., Iwasaki,Y., Kojima,T.	65µm DVB/PDMS 30 min @ 70°C immersed, NaOH added	GC-MS
479	Nicotine, cotinine in urine	Analysis of Nicotine and Cotinine in biological fluid sample by SPME Jpn. J. Legal. Med (49 Append): 80(1995) Iwasaki,Y., Yashiki,M., Nagasawa,N., Miyazaki,T., Kojima,T.	100µm PDMS 80°C, 5 min headspace	GC-MS
480	Stimulants in blood & urine	Analysis of Stimulants and Narcotics Bunseki 10:816-822(1995) Yashiki,M., Kojima,T.	100µm PDMS 20 min @100°C 3pH, (NH4)2SO4,NaCl headspace	GC-NPD
650	**Fenfluramine, amphetamine, methamphetamine in blood**	**Simple and simultaneous analysis of fenfluramine, amphetamine, and methamphetamine in whole blood by GC-MS after headspace SPME and derivatization Forensic Sci. Int. 2000, 109(3), 215-223 Namera, A., Yahiki, M., Liu, M., Okajima, K., Hara, K., Imamura, T., Kojima, T.**	**15 min, headspace**	**GC-MS**
481	Amphetamines, ecstasy in powder & tablets	SPME/Capillary GC for the profiling of confiscated ecstasy and amphetamine Chromatographia, (1999) 50 (3/4), 247-252 Kongshaug, K., Pedersen-Bjergard, S., Krogh,M., Rasmussen, K	65µm DVB/PDMS headspace/immersed 0.1M acetate buffer pH 5	GC-NPD
482	Ecstasy and amphetamines in urine	Automated determination of ecstasy and amphetamines in urine by SPME and capillary GC after polylchloroformate derivatization. J. Pharm. Bomed. Anal. (1999), 19(3+4), 463-475 Ugland, H., Kogh, M., Rasmussen, K.	100µm PDMS 16 min, immersed pH10	GC-NPD or MS
562	Amphetamines in urine	Rapid analysis of amphetamine, methamphetamine, MDA, and MDMA in urine using SPME, direct On-Fiber derivatization, and analysis by GC-MS J. Anal. Toxicol. 24, 11-16 (2000) Jurado, C., Gimenez, M., Soriano, T., Menedez, M., Repetto, M.	100µm PDMS 10 min @ 100°C headspace, 2N NaOH 20 min @ 60°C on fiber trifluoroacetic anhydride	GC-MS

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
483	Amphetamines in urine & blood	Rapid Analysis Amphetamines in Blood Using SPME 20th Japan Biomedical Mass Spectrometry:127-130(1995) Yashiki,M., Kojima,T.	100µm PDMS 5 min @ 80°C immersed, NaOH added	GC-MS
484	Amphetamines in urine & blood	Detection of Amphetamines and Inflammable Compounds in Biological Materials Using GC/MS and SPME Jpn. J. Forensic Toxicol. 12(2):120-121(1994) Yashiki, M., Kojima,T., Miyazaki,T.	100µm PDMS 5 min @ 80°C immersed, NaOH added	GC-MS
188	Amphetamines in urine	Quantitative and Qualitative Analysis of MDMA, MDEA, MA, and Amphetamine in Urine by Headspace/SPME and GC/MS Forensic Sci. Intl. 83 (3): 161-166 (1996) Centini, F., Masti, A., Comparini, I.	100µm PDMS 5 min @ 90°C headspace	GC-MS
70	Amphetamines in urine	Detection of Amphetamines in Urine Using Head Space SPME and Chemical Ionization Selected Ion Monitoring Forensic Sci Intl., 76(2), 169-177 (1995) Yashiki, M., Kojima, T., Miyazaki, T., Nagasawa, N., Iwasaki, Y., Hara, K.	100µm PDMS 5 min 80°C stirring	GC-FID
173	Amphetamines in blood	Rapid Analysis of Amphetamines in Blood Using Headspace SPME and Selected-Ion Monitoring Forensic Sci. Intl. 78 (2): 95-102 (1996) Nagasawa, N., Yashiki, M., Iwasaki, Y., Hara, K., Kojima, T.	100µm PDMS 5 min @ 80°C heptafluorobutyr- amide derivative	GC-SIM-MS
327	Amphetamines in urine	Method Optimization for the Analysis of Amphetamines in Urine by SPME Anal. Chem. 69 (19): 3899-3906 (1997) Lord, H., Pawliszyn, J.	100µm PDMS 15-60 min headspace stirring	GC-FID
192	Amphetamines in urine	Simple Clean-up of Methamphetamine and Amphetamine in Human Urine by Direct-Immersion SPME Jpn. J. Forensic Toxicol. 14 (3): 228-232 (1996) Ishii, A., Seno, H., Kumazawa, T., Suzuki, O., Nishikawa, M., Watanabe, K., Hattori, H.	100µm PDMS 30 min @ 65°C Na2CO3 added immersed	GC-NPD
145	Amphetamines in urine	Application of SPME Technique for the Detection of Urinar Methamphetamine and Amphetamine by GC J. Can. Soc. Forensic Sci. 29: 43, (1996) Ameno, K., Fuke, C., Ameno, S., Kinoshita, H., Ijirei, I.		GC
421	Amphetamines, methamphetamine in hair	Determination of Amphetamine and Methamphetamine in Human Hair by Headspace SPME and GC-NPD J. Chromatogr. B: Biomed. Sci. Appl. (1998), 707(1+2) 99-104 Koide, I., Noguchi, O., Okada, K., Yokoyama, A., Oda, H., Yamamoto, S., Kataoka, H.	100µm PDMS 15 min @45°C immersed, NaOH added	GC-NPD
194	Methamphetamine, cocaine in urine	Rapid Analysis of Methamphetamine and Cocaine in the Urine of Drug Abusers with SPME Chromatography 18 (3): 185-188 (1996) Makino, Y., Takgi, T., Ohta, S., Hirobe, M.	100µm PDMS 15 min immersion pH 10.5	GC-FTD
198	Amphetamines in urine	Screening Procedure for 21 Amphetamine-Related Compounds in Urine Using SPME and Gas Chromatography-Mass Spectrometry J. Chromatogr. Sci. 36: 1-7 (1998) Battu, C., Marquet, P., Fauconnet, A., Lacassie, E., Lachatre, G.	100µm PDMS 80°C, 10 min headspace salt added	GC-MS
566	Amphetamines in urine	Automated drug analysis by in-tube SPME-LC-MS Chromatography. Jun 1999; 20(2): 142-145 Kataoka,-H; Lord,-HL; Pawliszyn,-J	60cm x 0.25mm ID tube Omegawax 250	LC-MS electrospray

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
651	**Amphetamines in urine**	**Simple and rapid determination of amphetamine, methamphetamine and their methylenedioxyl derivatives in urine by automated in-tube SPME coupled with LC-electro-spray ionization mass spectrometry J. Anal. Toxicol (2000), 24(4), 257-265 Kataoka,-H; Lord,-HL; Pawliszyn,-J**	**In-tube Omegawax 250**	**LC-MS electrospray**
652	**Amphetamines methamphetamine in serum**	**Determination of amphetamine and methamphetamine in serum via headspace derivatization SPME-GC-MS J. Chromatogr. A, 896, (2000) 265-273 Lee, M., Song, Y., Hwang, B., Chou, C.**	**PDMS 40 min, headspace pH 9.5 heptafluorobutyric anhydride ethyl acetate**	**GC-MS**
71	Amphetamines, alcohols in urine, serum	Comparison of New Solid Phase Extraction Methods for Chromatographic Identification of Drugs in Clinical Toxicology Analysis Degel, F., Weidemann, G.	100µm PDMS, 85µm polyacrylate 60°C, 15 min headspace	GC-FID
485	Amphetamines in biological fluids	Some Problems of Detecting Amphetamines in Biological Materials by using Triage Pract. Forens. Med. 40:99-102 (1997) Watanabe,T., Namera,A., Yashiki,M., Iwasaki,Y., Kojima,T.	100µm PDMS 5 min @ 80°C CaCO3 added headspace	GC-MS
234	Drug Summary	Analysis of Drugs and Poisons in Legal Medicine J. Mass Spectrom. Soc. Jpn. 44: 321-333 (1996) Suzuki, O., Seno, H., Ishii, A.	Various fibers & conditions	
79	Drugs of abuse in urine	Determination of Drugs of Abuse Using SPME (German) Labor-Med. 18 (2): 112-118 (1995) Singer, K., Wenz, B., Seefeld, V., Speer, U.	100µm PDMS, 85µm polyacrylate 40°C, 20 min immersion, stirring	GC-MS
81	Cocaine in urine	Detection of Cocaine in Human Urine by SPME and Capillary GC with Nitrogen-Phosphorus Detection Jpn. J. Forensic Toxicol. 13 (3): 207-210 (1995) Kamazawa, T., Watanabe, K., Sato, K., Seno, H., Ishii, A., Suzuki, O.	100µm PDMS 30 min immersion, stirring NaF added	GC-FPD
653	**Volatiles from cocaine, heroin**	**SPME/GC-MS characterization of volatiles associated with cocaine and heroin Am. Lab, Sept. 2000, 32-34 Vu, D., Nicholas, P. Erikson, C.**	**30/50Carboxen/DVB/PDMS 85µm polyacrylate 90 min headspace**	**GC-MSD**
486	Methyl Benzoate on currency	Field and Laboratory comparison of the sensitivity and reliability of cocaine detection on currency using chemical sensors, humans, K-Os and SPME/GC/MS Proceeding SPIE-Int. Soc. Opt. Eng, 3576:41-46 (1999) Furton, K., Hsu, Y., Luo, T., Norelus, A., Rose, S.		GC-MS-MS
164	Barbiturates in water	Determination of Barbiturates by SPME and Ion Trap GC-MS J. Chromatogr. A 777: 275-282 (1997) Hall, B., Brodbelt, J.	65µm Carbowax/DVB 20 min immersion, stirring	GC-MS
572	Benzoylecgonine in urine	Aqueous phase hexyl chloroformate derivatization and SPME determination of benzoylecgonine in urine by GC-Quadrapole ion trap mass spectrometry J-Forensic-Sci. May 1999; 44(3): 527-534 Hall,-BJ; Parikh,-AR; Brodbelt,-JS	100µm PDMS 10 mi. @ 55°C hexyl chloroformate derivative	GC-EMIS
224	Barbiturates in urine and serum	Determination of Barbiturates by SPME and Capillary Electrophoresis Anal. Chem. 69: 1217-1222 (1997) Li, S., Weber, S.	polyvinyl coated metal rod 5, 10, 30 min	electrophoresis 230nm

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
596	Barbiturates in urine/serum	Artificial receptor-facilitated SPME of barbiturates. Anal-Chem. 1 Jun 1999; 71(11): 2146-2151 Li,-S; Sun,-LF; Chung,-Y; Weber,-SG	PVC/steel rod 5 min immersed	CE
654	**Meperidine in urine and blood**	**Detection of Meperidine (Pheonthiazin) in human blood and urine by Headspace SPME and Gas Chromatography Jpn. J. Forensic Toxicol. 13 (3): 211-215 (1995) Seno, H., Kumazawa, T., Ishii, A., Nishikawa, M., Hattori, H., Suzuki, O.**	**100°C, 30 min headspace salt & NaOH added**	**GC**
196	Phencyclidine in blood and urine	Simple Extraction of Phencyclidine from Human Body Fluids by Headspace SPME Chromatographia 43 (5-6): 331-333 (1996) Ishii, A., Kumazawa, T., Watanabe, K., Hattori, H., Suzuki, O.	100µm PDMS 90°C, 30 min headspace	GC-surface ionization detector
487	Diphenylmethane blood and urine	Simple Analysis of Diphenylmethane Antihistaminics and their Analogous in bodily Fluids by headspace SPME capillary gas chromatography J. Chromatogr. Sci. 35:275-279(1997) Nishikawa,M., Seno,H., Ishii,A. Suzuki,O., Kumazawa,T., Watanabe,K., Hattori,H.	100µm PDMS 10 min @ 98°C 10N NaOH	GC-FID
179	Ethanol in blood	Blood Alcohol Determination with Automated SPME: A Comparison with Static Headspace Sampling J. Can. Soc. Forens. Sci. 30: 7-12 (1997) Penton, Z.	65µm Carbowax/DVB 3 min headspace salt & NaF added	GC-FID
191	Ethanol in blood, urine	Detection of Ethanol in Human Body Fluids by Headspace SPME/Capillary GC Chromatographia 43 (7-8): 393-397 (1996) Kumazawa, T., Seno, H., Lee, X., Ishii, A., Suzuki, O., Sato, K.	65µm Carbowax/DVB 70°C, 10 min headspace, (NH4)2SO4	GC-MS
418	Ethanol in blood, urine	Improved Extraction of Ethanol from Human Body Fluids by Headspace SPME with a Carboxen/PDMS Fiber Chromatographia (1998), 47(9/10), 593-595 Lee, Z., Kumazawa, T., Sato, K., Seno, H., Ishii, A., Suzuki, O.	Carboxen/PDMS	
206	Antihistamine drugs in blood, urine	Simple Analysis of Diphenylmethane Antihistamines and Their Analogue in Bodily Fluids by Headspace SPME-Capillary Gas Chromatography J. Chromatogr. Sci. 35 (6): 275-279 Nishikawa, M., Seno, H., Ishii, A., Suzuki, O., Kumazawa, T., Watanabe, K., Hattori, H.	100µm PDMS 90°C, 10 min headspace	GC-FID
64	Tricyclic antidepressants in urine	Simple Extraction of Tricyclic Antidepressants in Human Urine by Headspace SPME Jpn. J. Forensic Toxicol. 13 (1): 25-30 (1995) Kumazawa, T., Lee, X., Tsai, M., Seno, H., Ishii, A., Sato, K.	100µm PDMS 100°C, 15 min headspace stirring	GC-FID
95	Tricyclic antidepressants in blood	Detection of Tricyclic Antidepressants in Whole Blood by Headspace SPME-Capillary GC J. Chrom. Sci. 35: 302-308 (1997) Lee, X., Kumazawa, T., Sato, K.	100µm PDMS 100°C, 60 min headspace NaOH added	GC-FID
488	Tricyclic antidepressants in urine, blood	Analysis of Tricyclic Antidepressant and that application for fatal intoxication by Headspace SPME Jpn. J. Legal. Med. 52:69(1998) Watanabe,T., Namera,A., Yashiki,M., Iwasaki,Y., Kojima,T.	100µm PDMS 45 min @ 120°C headspace, NaOH	GC-MS

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
352	Tetracyclic antidepressants in blood	Simple Analysis of Tetracyclic Antidepressants in Blood Using Headspace SPME and GC-MS J. Anal. Toxicology, Vol. 22 (5), 1998, 396-400 Namera, A., Watanabe, T., Yahiki, M., Iwasaki, Y., Kojima, T.	100µm PDMS 120°C, 45 min headspace NaOH added	GC-MS
655	**Antidepressant in urine**	**Direct coupling of microcolumn liquid chromatography with in-tube SPME for the analysis of antidepressant drugs Analyst (Cambridge UK) 2000, 125(5), 807-809 Saito, Y., Kawazoe, M, Jinno, K., Nayhashida, M.**	**In-tube**	**HPLC**
227	Diazepam in serum	Solvent-Modified Solid-Phase Microextraction for the Determination of Diazepam in Human Plasma Samples by Capillary Gas Chromatography J. Chromatogr. B 689: 357-364 (1997) Krough, M., Grefslie, H., Rasmussen, K.	85µm polyacrylate 4 min immersion pH 5.5 1-octanol added	GC-FID or FPD
656	**Amitriptyline in human urine**	**SPME coupled with microcolumn LC for the analysis of amitriptyline in human urine Chromatographia, (2000 Sept.) 52(5-6) 309-313 Jinno, K., Kawazoe, M., Hayashida, M.**		**HPLC**
371	Benzophenone-3 in water and urine	Determination Benzophenone-3 and Metabolites in Water and Human Urine by SPME and Quadrupole Ion Trap GC-MS Anal. Chimica Acta 371 (1998) 195-203 Felix, T., Hall, B., Brodbelt, J.	65µm Carbowax/DVB 45 min immersion	GC-MS
168	Antidepressants in blood	Solid Phase Microextraction with Capillary GLC and NDPD for the Assay of Antidepressant Drugs in Human Plasma J. Chromatogr. B 696: 217-234 (1997) Ulrich, S., Martens, J.	100µm PDMS 60 min immersion	GC-NDPD
657	**Phenothiazines urine, blood**	**Determination of Phenothiazines in human body fluids by SPME and LC-tandem mass spectrometry J.Mass Spec. (2000-9) 35(9) 1091-1099 Seno, H., Kumazawa, T., Ishii, A., Hattori, H., Nishikawa, M., Watanabe, K., Suzuki, O.**	**85µm Polyacrylate 60 min @ 40°C pH 8 stirring**	**LC-MS**
142	Phenothiazines urine, blood	Detection of Some Phenothiazines by Headspace SPME and GC Jpn. J. Forensic Toxicol. 14: 30 (1996) Kumazawa, T., Seno, H.,, Ishii, A., Hattori, H., Sato, K., Watanabe, K., Suzuki, O.	100µm PDMS 40 min @ 140°C headspace NaCl added	GC-FID
183	Herbicides in water and biological fluids	SPME and GC-ECD Determination of Dinitroaniline Herbicides in Surface Water and Biological Fluids Jpn. J. Forensic Toxicol. 15 (2): 151-153 (1997) Prosen, F., Watanabe, K., Ishii, A., Seno, H., Suzuki, O.	100µm PDMS 30 min @ 70°C water @ 90°C blood Na2SO4, headspace	GC-ECD
66	Organophosphate pesticides in urine, blood	Detection of Organophosphate Pesticides in Human Body Fluids by Headspace SPME and Capillary GC with Nitrogen-Phosphorus Detection Chromatogrphia 42(3/3): 135-140 (1996) Lee, X., Kumazawa, T., Taguchi, T., Sato, K., Suzuki, O.	100µm PDMS 100°C, 20 min pH 3 with HCl	GC-NPD
103	Malathion in blood	Rapid Analysis of Malathion in Blood Using Head Space Solid Phase Microextraction and Selected Ion Monitoring Forensic Sci. Int. 88: 125-131 (1997) Namer, A., Yashiki, M., Nagasawa, N., Iwasaki, Y., Kojima, T.	100µm PDMS 90°C, 5 min headspace	GC-MS

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
489	Parathion in blood	Rapid analysis of parathion in biological samples using headspace SPME and GC-MS Clin. Chem. Lab. Med. 1999, 37(6), 639-642 Musshoff, F., Junker, H., Madea, B	headspace	GC-MS
136	Carbamate in urine, serum	Determination of Some Carbamate Pesticides in Human Body Fluids by Headspace SPME/GC Jpn. J. Forensic Toxicol. 14 (3): 199-203 (1996) Seno, H., Kumazawa, T., Ishii, A., Nishif, M.	100µm PDMS 70°C, salt headspace	GC-NPD
490	Arylamide Herbicides in Serum	Simple Analysis of Arylamide Herbicides in Serum using Headspace SPME and GC-MS 6th Indo Pacific Congress on Legal Medicine and Forensic Science. 770-773(1998) Namera,A., Watanabe,T., Yashiki,M., Iwasaki,Y., Kojima,T.	100µm PDMS 45 min @ 90°C headspace, NaCl	GC-MS
107	Diazepams in biological fluids	Solid-Phase Microextraction/Liquid Chromatography (SPME/LC) for Drug Analysis in Biological Fluids Chromatography (1997), 18(4), 244-245, Jinno, K.	85µm polyacrylate 30°C, 3 hr	HPLC-UV, 200nm
658	**Drugs in biological fluids**	**SPME of drugs from biological matrices J. Chromatogr. A 885(2000) 445-455 Snow, N.**	**review article**	
234	Drugs in biological fluids	Analysis of Drugs and Poisons in Legal Medicine J. Mass Spectrom. Soc. Jpn. 44: 321-333 (1996) Suzuki, O., Seno, H., Ishii, A.	100µm PDMS & 85µm polyacrylate headspace NaCl, Na2SO4,	GC-MS
108	Volatiles in urine	Confirmation of Volatiles by SPME and GC-MS in the Investigation of Two Traffic Fatalities J. Anal. Toxicol. 1997, 21(4), 286-290 Brewer, W., Galipo, R., Morgan, S., Habben, K.	85µm polyacrylate 60°C, 10 min headspace	GC-MS
564	Tetarchoroethylene trichloroethylene in tissue, urine, serum	Tetrachloroethylene and trichloroethylene fatality: case report and simple headspace SPME-capillary GC determination in Tissues J. Anal.Toxicol, 24 (1), 22-26, (2000) Dehon, B., Humbert, L., Devisme, L., Stievenart, M., Mathieu, D. Houdret, N., Lhermitte, M.	100µm PDMS 1 min headspace 60°C	GC-ECD
113	Estrogen, steroids in water/biological fluids	Analysis of Steroids from Human Serum by SPME with Headspace Derivatization & GC J. High Res. Chromatogr. 20: 171-173 (1997) Okeyo, P., Rentz, S., Snow, N.	85µm polyacrylate 30 min immersion, stirring BSTFA derivative	GC-MS
373	Estrogen, steroids in water/biological fluids	Analysis of Estrogens and Anabolic Steroids by SPME with On-Fiber Derivatization and GC-MS J. Microcolumn Separations, 10(7) 551-556 (1998) Okeyo, P., Snow, N.	85µm polyacrylate 30 min immersion, stirring BSTFA derivative	GC-MS
404	Estrogen, steroids in water/biological fluids	On-Fiber Derivatization for Analysis of Steroids by SPME-GC-MS Book chapter Snow, N.	60µm Carbowax/DVB 60°C, 30 min immersion stirring BSTFA derivative	GC-MS
200	Ethanol, acetone, isoprene in human breath	Solid Phase Microextraction for the Analysis of Human Breath Anal. Chem. 69: 587-596 (1997) Grote, C., Pawliszyn, J.	100µm PDMS 10-60 sec headspace	GC-MS
659	**Isoprene in human breath**	**Determination of isoprene in human expired breath using SPME with GC-MS J Chromatogr, B. Biomed Appl. 739(1), 183-190 Hyspler, R, Crhova, S. Gasparic, J., Cizkova, M., Balasova, V., Zadak, Z.**	**Carboxen/PDMS 10 min @ 40°C from tedlar bag sample**	**GC-MS**

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
322	Chloroethenes in biological fluids	Determination of Chloroethenes in Environmental Biological Samples Using GC Coupled with SPME Chromatographia 42 (5/6): 313-317 (1996) Xu, N., Vadegrifts, S., Sewell		
660	**Halothane in biological samples**	**Rapid analysis of halothane in biological samples using headspace SPME and GC-MS - a case of double homicide** **J.Anal. Toxicol. (2000), 24(5), 372-376** **Musshoff, G., Junker, H., Madea, B.**		**GC-MS**
491	Clozapine in human plasma	SPME for the assay of clozapine in human plasma Fresenius' J. Anal. Chem, 1999, 364(7), 654-655 Kruggel, S., Ulrich, S.	100µm PDMS 30 min pH adj. NaOH	
575	Homocysteine in plasma/water	Determination of homocysteine and its related compounds by SPME-gas chromatography-mass spectrometry. J-Chromatogr,-B:-Biomed-Appl. 30 Apr 1999; 727(1-2): 1-8 Myung,-S-W; Kim,-M-S; Min,-H-K; Yoo,-E-A; Kim,-K-R	85µm polyacrylate 30 min immersed pH 3	GC-MS
405	γ-Hydroxybutyric acid in plasma, urine	Determination of gamma-Hydroxybutyric Acid (GHB) in Plasma and Urine by Headspace SPME and GC-Positive Ion Chemical Ionization MS Giampietro Frisom, Centre Behavioural and Forensic Toxicology Institute of Legal Medicine, University of Padova, Via Falloppio 50, I-35121 Padova Italy	50µm Carbowax/TPR100 70°C, 15 min headspace pH 6-7	GC-PICI-MS
323	1-Phenylethylamine in urine	Simple Extraction of 1-Phenylethylamine in Human Urine by Headspace SPME Jpn. J. Forensic Toxicol. 15(3): 189-193 (1997) Ishii, A., Seno, H., Prosen, F., Watanabee, K., Kumanzawa, T., Hattori, H., Suzuki, O.	65µm PDMS/DVB 30 min @ 90°C 10M NaOH, K2CO3 headspace	GC-NPD
324	Benzodiazepines in urine	Detection of Benzodiazepines in Human Urine by Direct Immersion SPME-GC Jpn. J. Forensic Toxicol. 15 (1): 16-20 (1997) Seno, H., Kumazawa, T., Ishii, A., Watanbe, K., Hattori, H., Suzuki, O.	65µm PDMS/DVB 30 min immersion	GC-FID
325	Benzodiazepines in water & urine	Determination of Five Benzodiazepines in Aqueous Solution and Biological Fluids, Using SPME with Carbowax/DVB Fiber Coating J. Microcolumn Sep. 10 (2): 193-201 (1998) Luo, Y., Pan, L., Pawliszyn, J.	65µm Carbowax/DVB 45°C, 60 min stirring pH 7, salt added	GC-FID, GC-MS
351	Benzophenones in urine	SPME and GC-ECD of Benzophenones for Detection of Benzodiazepines in Urine J. Anal. Toxicology, Vol. 23, Jan/Feb 1999 , 54-61 Prosen, F., Seno, H., Ishii, A., Watanabe, K., Kumazawa, T., Hattori, H., Suzuki, O.	100µm PDMS 30 min immersion, stirring pH 9.4 KOH added	GC-ECD
357	Benzodiazepines in urine	SPME-Microcolumn LC for the Analysis of Benzodiazepines in Human Urine Analusis (1998), 26(5), M27-M30 Jinno, K., Taniguchi, M., Hayashida, M.	Carbowax/TPR100 60 min immersion	HPLC-UV 220nm
326		SPME for Sample Preparation During Drug Metabolism Studies Pharmazie 53 (3): 172-177 (1998) Kroll, C., Borchert, H.		
328	Cyanide in blood	Analysis of Cyanide in Blood by Headspace SPME and Capillary GC Chromatographia 47 (3/4): 209-214 (1998) Takekawa, K., Oya, M., Kido, A., Suzuki, O.	Carbowax/DVB 50°C, 45 min headspace Na2SO4 added	GC-NPD

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
492	Lead in whole blood & Urine	Determination of Lead in Blood and Urine by SPME-GC Anal. Chem. 1999, 71(15), 2998-3002 Yu, X., Yuan, H., Gorecki, T., Pawliszyn, J.	headspace sodium tetraethyl borate derivative	
747	**Lead in whole blood & Urine**	**Speciation of Alkyllead and Inorganic lead by derivatization with deuterium-labeled sodium tetraethylborate and SPME GC-MS** **Anal. Chem. 2000, 72,1788-1792** **Yu, X, Pawliszyn, J.**	**100µm PDMS** **10 min, headspace** **sodium tetraethyl borate derivative**	**GC-MS**
416	Methylmercury in biological fluids or sediment	Determination of Methylmercury in Biological Samples and Sediments by Capillary GC Coupled with Atomic Adsorption after hydride derivatization and SPME J. Anal. At. Spectrom. (1998), 13(10), 1141-1144 He, B., Jiang, G., Ni, Z.	5cm fused silica fiber 90 min headspace KBH4 derivative	GC-AA
493	Alkalated Hg, Pb, Sn in urine	Simultaneous determination of Hg(III) and alkylated Hg, Pb, and Sn species in human body fluids using SPME-GC-MS-MS Fresenius' J.. Anal. Chem. (1999), 363(5-6), 466-468 Dunemann, L., Hajimiragha, H., Begerow, J.	100µm PDMS 10 min NaBEt4 derivatives pH 5.3	GC-MS-MS
661	**Organometallic**	**Coupling of SPME and GC-ECD for the determination of organometallic compounds** **Mikrochim Acta, (2000) 135 (No.1&2) 91-95** **Mothes, S, Wennrich, R.**		**GC-ECD**
329	Methanol in blood	Simple Extraction of Methanol in Human Whole Blood by Headspace SPME Jpn. J. Forensic Toxicol. 16 (1): 64-68 (1998) Lee, X., Kumazawa, T., Jurosawa, T., Akiya, K., Akiya, Y., Fruta, S., Sato, K.	Carboxen/PDMS 60°C, 10 min headspace stirring	GC-FID
330	Aromatic amines in urine, blood, milk	Solid Phase Microextraction of Monocyclic Aromatic Amines from Biological Fluid Anal. Chem. 70 (9): 1986-1992 (1998) DeBruin, L., Josephy, P., Pawliszyn, J.	65µm PDMS/DVB 45°C, 15 min headspace, salt added KOH added, pH >13	GC-FID
494	Trimethylamineuria in urine	Quantitative determination of trimethylamine in urine by SPME-GC-MS J. Chromatogr. B: Biomed Sci. Appl., 1999, 723(1+2), 281-285 Mills, G., Walke, V., Mughal, H.	65µm Carboxen/PDMS, 100µm PDMS 15 min @ 59°C headspace stirred	GC-MS
331	PAHs in urine	Fast Screening Method for the Profile Analysis of Polycyclic Aromatic Hydrocarbon Metabolites in Urine, Using Derivatization-SPME J. Chromatogr. G: Biomed. Sci. Appl. 705 (1): 132-138 (1998) Gmeiner, G., Krassnig, C., Schmid, E., Tausch, H.	85µm polyacrylate 35°C, 45 min stirring BSTFA derivative	GC-MS
495	BTEX in in urine & blood	SPME and GC-MS for determination of monoaromatic hydrocarbons in blood and urine. Application to people exposed to air pollutants Chromatographia, 1999, 50(3/4), 167-172 Andreoli, R., Manini, P. Bergamaschi, E., Brustolin, A., Mutti. A.	75µm Carboxen/PDMS headspace	GC-MS
591	BTEX in urine	Headspace solid-phase micro-extraction for the determination of BETX in urine. J-Chromatogr,-B:-Biomed-Appl. 19 Feb 1999; 723(1-2): 105-115 Fustinoni,-S; Giampiccolo,-R; Pulvirenti,-S; Buratti,-M; Colombi,-A	100µm PDMS 15 min @ 30°C headspace	GC-EMIS

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
662	**Toluene in blood**	**The comparison of toluene determination between headspace SPME and Headspace methods in glue sniffer's blood and urine samples J. Forensic Sci. (2000), 45(3), 702-707 Kim, N., Park, S.**	**100µm PDMS**	
496	Toluene, xylene in urine	Method for analyzing urinary toluene and xylene by SPME and its application to workers using organic solvents Bull. Environ, Contam. Toxicol. (1999), 62(2), 109-116 Asakawa, F., Jitsunari, F., Choi, J., Suna, S., Takeda, N., Kitamado, T.	100µm PDMS 5 min, NaCl, stirring	GC-FID
497	Toluene, benzene in human blood	Biomonitoring of benzene and toluene in human blood by headspace SPME Fresenius' J. Anal. Chem. (1999), 363(1)m 88-91 Schimmiing, E., Levsen, K., Koehme, C., Schuermann, W.	65µm Carboxen/PDMS 30 min @ 20°C headspace	GC-MS
332	Erythromycin in water	A Study of Erythromycin A Decomposition Products in Aqueous Solution by SPME-LC-MS Rapid Commun. Mass Spectrom. 10 (2): 225-234 (1998) Volmer, D., Hui, J.	65µm PDMS/DVB 15 min immersed 50% MeOH extr.	LC-MS
333	Corticosteroids in urine	Rapid Determination of Corticosteroids in Urine by Combined SPME-LC-MS Rapid Commun. Mass Spectrom. 11 (17): 1926-1934 (1997) Volmer, D., Hui, J.		LC-MS
663	**Beta blockers in urine, serum**	**Polypyrrole coated capillary in-tube SPME coupled with HPLC electrospray ionization MS for the determination of beta blockers in urine and serum samples J. Microcolumn Sep. (2000) 12(4), 255-266 Wu, J., Lord, H., Pawliszyn, J., Kataoka, H.**	**Polypyrrole capillary**	**LC-ESI-MS**
334	Flavor compounds in staphylococci	Evaluation of SPME for Analysis of Volatile Metabolites Produced by Staphylococci J. Agric. Food Chem. 46 (1): 228-234 (1998) Vergnaise, L., Masson, F., Montel, M., Berdague, J., Talon, R.	100µm PDMS, 85µm polyacrylate headspace stirring, salt added pH 3 for esters	GC-FID
498	Aldehydes, esters from bacteria	Application of SPME to measure volatile metabolites produced by Staphylococcus carnosus and Staphylococcus xylosus Book- Applied SPME, 1999, 364-371 Royal Society of Chemistry, Cambridge, UK Coden: 67TUA8 Talon, R, Montel, M.	100µm PDMS, 85µm polyacrylate 15 min, stirring esters @ 80°C, aldehydes @ 25°C headspace	GC-FID
392	Volatile metabolites in penicillium fungi	Application of Head-Space SPME for the Analysis of Volatile Metabolites Emitted by Penicillium Species J. Microbiological Methods, 25 (1996) 245-255 Nilsson, T., Larsen, T., Montanarrella, L., Madsen, J.	100µm PDMS, 85µm polyacrylate 25°C, 30 min (PDMS), 50 min (PA)	GC-MS
393	Volatiles in bacteria on poultry	Use of Digital Aroma Technology and SPME GC-MS to Compare Volatile Compounds produced by Bacteria Isolated from Processed Poultry J. Sci Food Agric. 1998, 78, 343-348 Arnold, J., Senter, S.	100µm PDMS 37°C, 30 min headspace	GC-MS
664	**Volatiles in lactic acid bacteria**	**Evaluation of SPME for the Isotopic Analysis of volatile compounds produced during fermentation by lactic acid bacteria J. Agric Food Chem. 2000, 48, 2222-2227 Goupry, S., Rochut, N., Robins, R., Gentil, E.**	**70µm Carboxen/PDMS 10 min headspace salt added**	**GC-C-IRMS**

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
570	Fatty acid esters in faeses	Headspace SPME with l-pyrenyldiazomethane in-fiber derivatization for analysis of fecal short-chain fatty acids J-Chromatogr,-B:-Biomed-Appl. 25 Jun 1999; 730(1): 113-122 Mills,-GA; Walker,-V; Mughal,-H	85µm polyacrylate 15 min 1-pyrenyldiazomethane derivative	GC-EMIS
335	Cannabinoids in water/saliva	Determination of Cannabinoids in Water and Human Saliva by SPME and Quadrupole Ion Trap GC-MS Anal. Chem. 70 (9): 1788-1796 (1998) Hall, B., Satterfield-Doeerr, M., Parikh, A., Brodbelt, J.	30µm PDMS 10 min immersion	GC-MS
665	**Dibenzylamine in saliva**	**Direct comparison of SPE and SPME for the GC determination of dibenzylamine in artificial saliva leachates from baby bottle teats Anal Chim Acta 2000, 414(1-2), 133-140 Niesner, G, Klampfl, C.**	**85µm polyacrylate pH 10**	**GC-MS**
340	Cannabinoids in hair	Solid-Phase Microextraction for Cannabinoids Analysis in Hair and Its Possible Application to Other Drugs J. Anal. Toxicology, Vol. 23, Jan./Feb. 1999 Strano-Rossi, S., Chiarotti, M.	30µm PDMS 15 min, immersion hair digested with 1N NaOH	GC-MS
666	**Lipophilic drugs in hair**	**Use of headspace SPME in hair analysis for organic compounds Forensic Sci. Int. (2000), 107(1-3), 129-148 Sporkiert, F., Pragst, F.**	**headspace hair digested with 4% NaOH**	
336	Review of use	SPME in Forensic Toxicology Jpn. J. Forensic Toxicol. 16 (1): 1-15 (1998) Namera, A., Yashiki, M., Kojima, T., Fukunaga, N.	various fibers and conditions	
337	Acylcarnitines in urine	Determination of Urinary Acylcarnitines by ESI-MS Coupled with SPME J. Mass Spectrom. 32 (11): 1195-1204 (1997) Mioder, M., Loster, H., Hraschuh, R., Popp, R.		ESI-MS
499	Methylxanthines in blood/urine	Extraction of methylxanthines from human body fluids by SPME Anal. Chim. Acta., 1999, 387(1), 53-60 Kumazawa, T., Seno, H., Lee, X., Ishii, A.	65µm Carbowax/DVB 1 hr @ 40°C 1ml of 1M HCl04	GC-NPD
414	Organic acid esters in urine	Urinary Organic Acid Screening by SPME of the Methyl Esters J. Chromatogr. B: Biomed Sci. Appl. (1998), 713(2), 427-432 Liebich, H., Gesele, E., Woll, J.	85µm polyacrylate 20 min immersion w/stirring trimethyloxonium tetrafluoroborate	GC-FID, -MS
667	**Semivolatile in tissue/blood**	**Validation of negligible depletion SPME as a tool to determine tissue/blood partition coefficient for semivolatiles and nonvolatile organic chemicals Toxicol. Appl. Pharmacol. (2000), 166(2), 138-144 Garicano, E., Vaes, W., Hermens, J.**		
415		New Mass Spectrometric Methods for the Fast Analysis of Biomedical-Relevant Substances CLB Chem. Labor Biotech. (1998), 49(11), 414-420 Volmer, D.		GC-MS
417	Verpamil & norverapamil in urine	SPME-HPLC Determination of Verpamil and Norverpamil Enantiomers in Urine J. Mass Spectrom. (1997), 32(11), 1195-1204 Asafu-Adjaye, E., Shiu, G.		HPLC

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
Forensics				
748	**Review**	**The use of SPME-GC in forensic analysis J. Chromatogr. Sci. (2000), 38(7), 297-306 Furton, K., Wang, J., Hsu, Y. Walton, J, Almirall, J.**		
500	Gasoline on skin	The detection and analysis of ignitable liquid residues extracted from human skin using SPME-GC Almirall, J., Wang, J., Lothridge, K, Furton, K.	100µm PDMS 15 min headspace	GC-FID
85	Accelerants in fire debris	A Simple, Inexpensive, Rapid, Sensitive and Solventless Technique for the Analysis of Accelerants in Fire Debris Based on SPME J. High Res. Chromatogr. 18: 625-629 (1995) Furton, K., Bruna, J., Almirall, J.	100µm PDMS 40°C, 20 min headspace	GC-FID
105	Gasoline, kerosene in fire debris	Forensic Application of the SPME Method to the Analysis of Gasoline and Kerosene Kaneko, T., Nakada, M.	100µm PDMS 22°C for 1 hr, or 80°C for 5 min headspace	GC-NPD
114	Accelerants in fire debris	Novel Method for Analysis of Gasoline from Fire Debris Using Headspace Solid Phase Microextraction J. Forensic Sci. 41: 12-22 (1996) Furton, K., Almirall, J., Bruna, J.	100µm PDMS 40°C, 20 min	GC-FID
115	Accelerants in liquid residue	The Recovery of Accelerants in Aqueous Samples from Fire Debris Using SPME Science & Justice 36 (4): 283-287 (1996) Almirall, J., Furton, K., Bruna, J.	100µm PDMS 20 min @ 40°C	GC-FID
143	Accelerants in fire debris	Determination of Liquid Accelerants in Arson Suspected Fire Debris Using Headspace SPME Anal. Commun. 33: 129 (1996) Steffen, A., Pawliszyn, J.	100µm PDMS 15 min @ 70°C headspace	GC-FID
594	Accelerants in fire debris	A comprehensive sample preparation scheme for a accelerants in suspect arson cases. J-Forensic-Sci. May 1999; 44(3): 504-515 Ren,-QL; Bertsch,-W		GC, GC-MS
668	**TNT, 2,4-DNT, RDX in soil**	**Development of field screening methods for TNT, 2,4-DNT, and RDX in soil. Talanta, 39: 419-28 (1992) T Jenkens, et al**		
344	explosives in salt water	Trace Analysis of explosives in Seawater Using SPME and GC-Ion Trap Mass Spectrometry Anal. Chem., Vol. 70, No. 14, July 15, 1998, pg. 3015-3020 Barshick, S., Griest, W.	65µm Carbowax/DVB 60 min immersion stirring	GC-MS
669	**Explosives from solids, water**	**Application of SPME to the recovery of explosives and ignitable liquid residues from forensic specimens J. Chromatogr A, 885(2000) 419-432 Furton, K., Almirall, J., Bi, M., Wang, J., Wu, L.**	**65µm Carbowax/DVB 25 min, 25% NaCl immersion stirring**	**GC-ECD HPLC**
592	explosives in water	An improved interface for coupling SPME to HPLC applied to the analysis of explosives J-High-Resolut-Chromatogr. May 1999; 22(5): 279-282 Wu,-L; Almirall,-JR; Furton,-KG	50µm Carbowax/TPR	HPLC-UV 254nm

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
Water				
1	BTEX compounds, PCBs, solvents in water	The Application of Chemically Modified Fused Silica Fibers in the Extraction of Organics from Water Matrix Samples and Their Rapid Transfer to Capillary Columns Water Pollution Research J. Canada 24: 179 (1989) Belardi, R., Pawliszyn, J.	uncoated fiber 1 min	GC-FID
3	VOCs in water	Solid Phase Microextraction for the Direct Analysis of Water: Theory and Practice LC-GC 10: 656-661 (1992) Arthur, C., Potter, D., Buchholz., K, Motlagh, S., Pawliszyn, J.	100µm PDMS 2-5 min salt added	GC-FID
4	VOCs, PCBs, solvents in water	Practical and Theoretical Aspects of Solid Phase Microextraction for the Direct Analysis of Groundwater Proceedings 15th Annual EPA Conference-Analysis of Pollutants in Environment, Norfolk, VA, May 1992 Arthur, C., Buchholtz, K., Motlagh, S., Killam, L., Pawliszyn, J.	100µm PDMS 5-14 min salt added	GC-FID
6	BTEX, gasoline in water	Analysis of Substituted Benzene Compounds in Groundwater Using SPME J. Env. Sci. Technol. 26: 979-983 (1992) Arthur, C., Potter, D., Lim, M., Motlagh, S., Killam, L., Pawliszyn, J.	56µm PDMS 2-6 min stirring	GC-FID
7	BTEX compounds in water	Dynamics of Organic Compounds Extraction from Water Using Liquid-Coated Fused Silica Fibers Anal. Chem. 64: 1187-1199 (1992) Louch, D., Motlagh, S., Pawliszyn, J.	56µm PDMS 2-6 min stirring	GC-FID
10	BTEX compounds in water	Detection of Substituted Benzenes in Water at the pg/mL Level Using Solid Phase Microextraction and GC-Ion Trap Mass Spectrometer J. Chromatogr. 625: 247-255 (1992) Potter, D., Pawliszyn, J.	100µm PDMS 30 min stirring	GC-FID
11	Organics in water	Environmental Analysis of Organic Compounds in Water Using Solid Phase Microextraction J. High Res. Chromatogr. 15: 741-744 (1992) Arthur, C., Pratt, K., Belardi, R., Motlagh, S., Pawliszyn, J.	100µm PDMS 14 min stirring	GC-MS
14	Phenols in water	Determination of Phenols by SPME and GC Analysis J. Environ. Sci. Technol. 27 (13): 2844-2848 (1993) Buchholz, K., Pawliszyn, J.	85µm polyacrylate 60 min stirring salt added, pH 2	GC-FID, -MS
230	Phenols in water	Determination of Phenolic Compounds in Waste Water by Solid-Phase Microextraction Fresenius' J. Anal. Chem. 357: 326-332 (1997) Moeder, M., Schrader, S., Franck, U., Popp, P.		GC-MS
670	**Phenols in water**	**Sorption of phenols to dissolved organic matter investigated by SPME Sci. Total Environ. (2000), 253(1-3), 63-74 Ohlenbusch, G., Kumke, M., Frimmel, F.**		
15	VOCs, phenols, semivolatiles in water	Recent Advances in Solid-Phase Microextraction (SPME) of Environmental Samples Proceedings Water Quality Technology Conference Miami, FL, Nov. 1993 Arthur, C., Pratt, K., Belardi, R., Motlagh, S., Pawliszyn, J.	100µm PDMS 5 min (volatiles) 10 min (semivolatiles) headspace stirring, salt added	GC-MS

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
671	**4-Quinolones in water**	**Influence of pH and other modifying factors on the distribution behaviors of 4-Quinolones to Solid phase and humic acids studied by "negligible-depletion" SPME-HPLC Environ Sci Technol. 20000, 34, 4989-4994 Lutzhoft, H. Vaes, W., Freidig, A., Halling-Sorrensen, B. Hermens, J.**	**CW/TPR** **pH 3-5.5**	**HPLC 260NM**
501	24 Semivolatiles in waste water	Development of SPME-GC method for the determination of organic compounds in waste water Acta Hydrochim. Hydrobiol. 1999, 27(4), 1913-199 Grote, C., Belau, E., Levsen, K., Wunsch, G.		GC
565	Semivolatiles in fish, water	Polyacrylate-Coated SPME fibers as a tool to simulate body residues and target concentrations of complex organic mixtures for estimation of baseline toxicity Environ. Sci. Technol. 2000, 34, 324-331 Verbruggen, E., Vaes, W., Parkerton, T., Hermens, J.	85µm polyacrylate 5-150 min	GC-MS
19	Chlorohydrocarbons in water	Determination of Volatile Chlorinated Hydrocarbons in Air and Water with Solid-Phase Microextraction Analyst 118: 1501, Dec. 1993 Chai, M., Arthur, C., Pratt, K., Pawliszyn, J., Belardi, R.	100µm PDMS 20 min (immersion) 10 min (headspace)	GC-ECD
436	Chlorohydrocarbons in water	Analysis of Volatile Halogenated Hydrocarbons in Water by SPME and GC-MS Chem. Listy (1998), 92(9), 633-642 Janda, V., Viden, I.	100µm PDMS 20 min stirred	GC-MS
20	PAHs, PCBs in water	Rapid Determination of Polyaromatic Hydrocarbons and Polychlorinated Biphenyls in Water Using Solid-Phase Microextraction and GC/MS J. Environ. Sci. Technol. 28: 298 (1994) Potter, D., Pawliszyn, J.	15µm PDMS 10 min stirring	GC-MS
672	**PAHs in water**	**Quantitative analysis of PAHs in water by SPME-HPLC Huanjing Huaxue (2000) 19(4), 382-384 Li, Y., Zhang, X., Xu, R., Cai, W., Wang, G., Song, Y.**		
22	VOCs, BTEX, PAHs in wastewater, sludge	Analysis of Organic Compounds in Environmental Samples Using Headspace Solid Phase Microextraction J. High Res. Chromatogr. 16: 689-692 (1993) Zhang, A., Pawliszyn, J.	100µm PDMS stirring, varied time saturated salt	GC-MS
673	**Jet fuels in ground water**	**Source identification of underground fuel spills by SPME/High Resolution GC/genetic algorithms Anal. Chem. (2000), 72(2), 423-433 Lavine, B., Ritter, J., Moores, A., Wilson, M., Faruque, A., Mayfield, H.**		
674	**Organic chemicals in waste water**	**Quantification of synthetic organic chemicals in biological treatment process effluent using SPME-GC Water Environ. Res, (2000), 72(1), 98-104 Magbanua, B., Mitchell, D., Gehniger, S., Bowyer, R., Grady, C., Leslie, J.**	**85µm polyacrylate**	**GC-FID**
675	**Musk fragrances in water**	**Optimization of SPME for the GC-MS determination of synthetic musk fragrances in water samples J. Chromatogr. A, (2000) 903(1-2), 203-210 Winkler, M., Headley, J., Peru, K.**	**PDMS/DVB 45 min @ 30°C**	**GC-MS**

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
502	Polycyclic musk in surface water	Occurrence and distribution of organic compounds in the aquatic system in Berlin, Germany. Part 3, Determination of synthetic musks in Berlin surface water applying SPME and GC-MS Acta Hydrochim Hydrobiol (1999), 27(3), 150-156 Heberer, T., Gramer, S., Stan, H.		GC-MS
676	**PAHs in water/soil**	**SPME and headspace SPME for the determination of high molecular-weight PAHs in water and soil samples J. Chromatogr. Sci., (2000) 38(12) 528-534 Doong, R., Chang, S., Yuh-Chang**	**100µm PDMS 85µm polyacrylate 20-60 min**	
677	**PAHs in water/soil**	**Determination of Distribution Coefficients of priority PAHs using SPME Anal. Chem. 2000, 72(15), 3647-3652 Doong, R., Chang, S.,**	**100µm PDMS 85µm polyacrylate 20-60min.**	
678	**PAHs in water/soil**	**SPME FOR determining the Distribution of 16 USEPA PAHs in water J.. Chromatogr.. A 2000, 879(2), 177-188 Doong, R., Chang, S., Sun,, Y.**	**100µm PDMS 85µm polyacrylate 20-60 min**	**GC-MS**
585	PAHs in water/humic material	Interaction between natural organic matter (NOM) and (PAH) comparison of fluorescence quenching and SPME. Fresenius'-J-Anal-Chem. Jun 1999; 364(4): 313-319 Doll,-TE; Frimmel,-FH; Kumke,-MU; Ohlenbusch,-G	7µm PDMS 20 min	GC-MS
25	PAHs, semivolatiles in water	Solid Phase Microextraction -- A Solventless Sample Preparation Method for Organic Compounds in Water American Environmental Lab April 1994, p 43-45 Shirey, R., Mani, V., Savrock, J.	7µm PDMS (PAHs) polyacrylate (semivol) 15 min, stirring saturated salt	GC-FID, -ECD
679	**Volatiles in water**	**Optimization of Extraction Conditions for Low-Molecular-Weight analytes using SPME J. Chrom. Sci., Vol. 38, March 2000, 109-116 Shirey, R.**	**six different fibers 15 min headspace sat. salt, pH2,7,11**	**GC-MS**
680	**Semivolatiles in water**	**Optimization of Extraction Conditions and Fiber Selection for Semivolatile Analytes using SPME J. Chrom. Sci., Vol. 38, July 2000, 279-288 Shirey, R.**	**seven different fibers 30 min, immersed sat. salt, pH2,7,11**	**GC-MS**
440	PAHs in water	Solvent-Free Method for the Determination of PAHs in Wastewater by SPME-HPLC with Photodiode-Array Detector J. Chromatogr. A (1998), 823(1+2), 211-218 Negrao, M., Alpenduradu, M.	100µm PDMS 45°C, 30 min stirring	HPLC-PAD
26	BTEX compounds in water	Analysis of BTEX in Water by Commercially Available SPME and CLOT Column Gas Chromatography J. Chromatogr. 677: 201-205 (1994) Sama, L., Webster, G., Friesen-Fisher, M., Ranjai, R.	100µm PDMS 35 min stirring	GC-FID
30	Nitrobenzenes in water	Determination of the Semi-Volatile Compounds Nitrobenzene, Isophorone, 2,4-Dinitrotoluene and 2,6-Dinitrotoluene in Water Using SPME with Polydimethylsiloxane-Coated Fiber J. Chromatogr. A 678: 313 (1994) Horng, J., Huang, S.	100µm PDMS 15 min stirring saturated salt	GC-FID
31	VOCs, chloropesticides in water	Rapid Analysis of Environmental Samples Using SPME and Narrow Bore Capillary Columns J High Res. Chromatogr. 18: 495-499 (1995) Shirey, R.	100µm PDMS 15 min stirring saturated salt	GC-MS

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
47	BTEX compounds in water	Determination of BTEX Compounds in Water by Solid-Phase Microextraction and Raman Spectroscopy Anal. Chem. 67: 600-605 (1995) Wittkamp, B., Tilotta, D.	100µm PDMS	GC-FID
681	**Volatiles**	**A new method for the rapid determination of volatile substances: the SPME-direct method Part 1: Apparatus and working conditions** **Sens, Acatuators, B. (2001) B72 (2) 184-187** **Bene, A., Fornage, A., Luisier, J., Pichler, P., Villettaz, J.**		
48	Methylmercury derivatives in water and fish	Determination of Methymercury in Fish and River Water Samples Using in situ Sodium Tetraethylborate Derivatization Followed by SPME and GC-MS J. Chromatogr. 696: 113-122 (1995) Cai, Y., Bayona, J.	100µm PDMS 10 min stirring headspace sodium tetraborate	GC-MS
407	Organomercury in water and soil	SPME and GC-MIP-AED for the Speciation Analysis of Organomercury Compounds J. High Resol. Chromatogr. 1999, 22 (3) 181-182 Mothes, S., Wennrich, R.	100µm PDMS 25°C 50 min (immersion) 20 min (headspace)	GC-MIP-AED
18	Bismuth III in water	Solid Phase Microextraction of Metal Ions Microchim. Acta 112: 41 (1993) Otu, E., Pawliszyn, J.	bare, or 100µm PDMS 60 min immersion	UV / VIS 460nm
682	**Dimethylarsinic acid arsonic acid**	**Speciation of dimethylarsinic acid and monomethyl-arsonic acid by SPME-GC-ion trap MS** **J. Chromatogr.A 2000, 873(1), 129-135** **Mester, Z., Pawliszyn, J.**	**100µm PDMS** **thioglycol methylate derv.**	**GC-MS**
96	Organo Hg, Sn, Pb in water	Sensitive, Simultaneous Determination of Organomercury Lead, and Tin Compounds with Headspace SPME Capillary GC Combined with Inductively Coupled Plasma MS Anal. Chem. 69: 1604-1611 (1997) Moens, L., DeSmaele, T., Dams, R., VanDen Broeck, P., Sandra, P.	100µm PDMS 10 min headspace stirring pH 5.3 NaBEtr derivative	ICP-MS
153	Organo Sn, Pb in water	Preconcentration and Determination of Sn- and Pb-Organic Species in Environmental Samples by SPME and GC-AED Fresenius' J. Anal. Chem. 354: 587 (1996) Tutschiku, S., Mothes, S., Wennrich, R.		GC-AED
215	Organo Sn in water	Determination of Organotin Compounds in Water Samples by Solid-Phase Microextraction (SPME) and GC-MS Ann. Chim. (Rome) 87: 497-504 (1997) Guidotti, M., Vitali, M.		GC-MS
152	Methyltin in water	Rapid Determination of Methyltin Compounds in Aqueous Samples Using SPME and Capillary GC Followed by in situ Derivatization with Sodium Tetraethylborate J. High Res. Chromatogr. 18: 767 (1995) Morcillo, Y., Cai, Y., Bayona, J.	100µm PDMS 29°C, 2-35 min headspace stirring NaBEtr derivative	GC-FPD
161	Lead derivatives in water	Determination of Tetraethyllead and Inorganic Lead in Water by SPME-GC Anal. Chem. 68: 3008 (1996) Gorecki, T., Pawliszyn, J.	100µm PDMS 10 min headspace	GC-MS

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
683	**Lead derivatives in water**	**Determination of Tetraethyllead by SPME-thermal desorption quartz furnace atomic absorption spectrometry J. Anal. At. Spectrom. 2000, 15(16), 705-709 Sandra Fraguairo, M, AlavapMoreno, F., Isela, B.**	**10 min, headspace**	**AA**
23	Organotin compounds in water	Rapid Determination of Butyl, Phenyl and Cyclohexyl Tin Compounds in Aqueous Samples Using SPME and Capillary Gas Chromatography Following in situ Derivatization with Sodium Tetraethylborate CID-CSIC Jordi Girona, 18-26, E-8034, Barcelona, Spain Morcillo, Y., Cai, Y., Porte, C., Bayona, J.	100µm PDMS 30 min immersion stirring NaBEt4 derivative	GC-FPD
503	Organo-tin, -lead, -mercury in water	Determination of organometallic compounds in surface water and sediment samples with SPME-CGC-ICPMS Mikrochim. Acta (1999), 130(4), 241-251 De Smaele, T., Moens, L., Sandra, P., Dams, R.	100µm PDMS 10 min headspace	GC-ICPMS
235	Rare earth elements	Separation of Cerium from Other Rare-Earth Elements with Application to Samarium-Neodymium and Lanthanum-Cerium Chronometry Nucl. Instrum. Methods Phys.Res.Sect.B 117: 201-208 (1996) Rehkaemper, M., Gaertner, M., Galer, S., Goldstein, S.		
580	Selenite, selenate in water	Selective determination of selenite and selenate using SPME and GC-MS J-High-Resolut-Chromatogr. Jul 1999; 22(7): 414-416 Guidotti,-M; Ravaioli,-G; Vitali,-M	35 min, agitation piazselenol derivative immersed	GC-MS
49	Nitroaromatics in water	Enrichment of Nitroaromatic Compounds from Water Samples by SPME GIT Spex Chromatogr. 14: 85-87 (1995) Schaefer, B., Engewald, W.		
160	Hetero aromatics in water	Trace Analysis of Hetero Aromatic Compounds in Water by SPME J. High Res. Chromatogr. 19: 627 (1996) Johansen, S., Pawliszyn, J.	85µm polyacrylate 60-200 min stirring pH 8, salt added	GC-MS
218	BTEX in water	Determination of Benzene Derivatives in Water by SPME Anal. Chim. Acta 343: 101-108 (1997) Huang, S., Cheng, C., Sung, Y.		
50	Nitrophenols in water	Enrichment of Nitrophenols from Water by Means of SPME Fresenius' J. Anal. Chem. 352: 535-536 (1995) Schafer, B., Engewald, W.	100µm PDMS 5 min stirring pH <2, saturated salt	GC-NPD
504	2,4-dinitrophenol in water	Determination of 2,4-dinitrophenol by SPME couple GC-MS Sepu (1999), 17(2), 131-133 Lu, X., Zhao, X., Ye, F., Xu, G.	85µm polyacrylate 30 min, immersed pH2, satr. salt Chinese	GC-MS
51	Fuel hydrocarbons in water	Quantitative Analysis of Fuel-Related Hydrocarbons in Surface Water and Wastewater Samples by SPME Anal. Chem. 68: 144-155 (1996) Langenfeld, J., Hawthorne, S., Miller, D.	100µm PDMS 45 min stirring	GC-FID
684	**VOCs in water**	**Determination of volatile organic compounds (VOCs) in drinking water using SPME Anal. Sci. Technol. (2000) 13(3), 277-281 Park, G., Lee, S.**	**100µm PDMS**	**GC-MS**

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
82	VOCs in water	An Evaluation of Solid Phase Microextraction for Analysis of Volatile Organic Compounds in Drinking Water J. High Res. Chromatogr. 18: 617-624 (1995) Nilsson, T., Ogaard-Madison, J., Montanrilla, L., Larsen, B., Facchetti, S., Pelusioj, F.	100µm PDMS 20-80°C, 60 min headspace stirring	GC-MS
685	**MTBE in surface water**	**Determination of MTBE in surface water by use of SPME Environ, Sci.Technol. (2000), 34(7), 1359-1364 Achten, C., Puettmann, W.**	**Carboxen/DVB/PDMS 69 min 25% NaCl, stirred**	**GC-MS**
686	**MTBE, Ethanol, other oxygenates in water**	**Trace Analysis of Ethanol, MTBE, and related Oxygenate Compounds in Water using SPME and GC-MS Anal. Chem. 2000, 72, 4654-4658 Cassada, D., Zhang, Y., Snow, D., Spalding, R.**	**Carboxen/DVB/PDMS 25 min immersed stirred Sat. salt,**	**GC-MS**
354	MTBE, EBE, BTEX in water	Analysis of Water Samples for Trace Levels of Oxygenated and Aromatic Compounds Using Headspace SPME and Comprehensive Two-Dimensional Gas Chromatography J. Microcolumn Separations, 10 (7), 597-604 (1998) Gaines, R., Ledford, E., Stuart, J.	75µm Carboxen/PDMS 40°C, 10 min headspace saturated salt	GC-FID
581	Tetrachloroethene in water	Role of humic acids in the titanium oxide-photocatalysed degradation of tetrachloroethene in water. Water-Res. Jun 1999; 33(8): 1827-1836 Selli,-E; Baglio,-D; Montanarella,-L; Bidoglio,-G	100µm PDMS	GC-MS
175	Trihalomethanes in water	Detection and Quantification of Trihalomethanes in Drinking Water from Alexandria, Egypt Contam. Toxicol. 56: 397-404 (1996) Hassan, A., Benfenati, E., Fanelli, R.		
687	**Dichlorobenzene in water**	**Analysis of dichlorobenzene in water by SPME J. Chin. Chem. Soc (2000) 47(2) 415-420 Liu, Y., Ho, W.**	**100um PDMS 30 min**	**GC-ECD**
83	Benzene, halobenzene in water	Application of Solid Phase Microextraction (SPME) in Combination with GC/FID: The Determination of Benzene and Halogenated Benzenes in Pure and Octanol-Saturated Water Chem-Anal (Warsaw) 40: 897-904 (1995) Popp, P., Paschke, A., Schroeter, U., Oppermann, G.		GC-FID
688	**Benzene derivatives in surface water**	**Matrix effect for several derivatives of benzene in water by SPME Chromatographia 2000, 51(suppl.) S328-S330 Javorszky, E., Molnar, E., Torkos, K. Borossay, J.**		
86	Organics in water	Comparison of On-line SPE-HPLC and SPME-GC for the Analysis of Microcontaminants in Water Chromatographia 41: 462-470 (1995) Rivasseau, C., Caude, M.		HPLC
217	Haloethers in water	Determination of Haloethers in Water by SPME J. Chromatogr. A 769: 239-246 (1997) Huang, S., Ting, C., Lin, C.	100µm PDMS 40 min, immersion saturated salt	GC-FID
586	Trichlorofluoroether in water	Anaerobic biotransformation of trichlorofluoroethene in groundwater microcosms. Environ-Sci-Technol. 15 Jun 1999; 33(12): 2040-2045 Vancheeswaran,-S; Hyman,-MR; Semprini,-L	100µm PDMS headspace salt, agitation	GC-MS

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
90	Aromatics in water	Determination of Volatile Organic Compounds in Water by Solid Phase Micro-Extraction and Infrared Spectroscopy Environ. Sci. Technol. 30: 1212-1219 (1996) Heglund, D., Tilotta, D.	parafilm, 30 min	GC-FID
505	Hydroxyaromatics in water	Determination of hydroxyaromatic compounds in water by SPME coupled to HPLC J. Chromatogr. A. (1999), 835(1+2), 127-135 Wu, Y., Huang, S.	PDMS/DVB or CW-TPR	HPLC 280nm
229	71 organics in gaseous mixture	Calibration of a Commercial Solid-Phase Microextraction Device for Measuring Headspace Concentrations of Organic Volatiles Anal. Chem. 63: 364-372 (1997) Bartlet, R.	100µm PDMS 25°C, 30 min headspace	GC-FID
155	VOCs in water	Sampling Volatile Organic Compounds Using a Modified Solid Phase Microextraction Device J High Res. Chromatogr. 19: 155 (1996) Zhang, Z., Pawliszyn, J.	100µm PDMS 10 min headspace stirring, saturated salt	GC-MS
205	Volatiles in water	Solid Phase Microextraction of Volatile Compounds Using Carboxen-Polydimethylsiloxane Fibers Chromatographia 46: 419-424 (1997) Popp, P., Paschke, A.	75µm Carboxen/PDMS 30 min headspace stirring	GC-FID, ECD
240	Volatiles in water	Application of Solid-Phase Microextraction to the Analysis of Volatile Organic Compounds in Water J. Chromatogr. A 742: 181-189 (1996) Santos, F., Galceran, M., Fraisse, D.	100µm PDMS, 85µm polyacrylate 12 min stirring	GC-FID
689	**BTEX in water**	**Static headspace, SOME and headspace SPME for BTEX determination in aqueous samples by GC Anal. Chim. Acta. 2000, 415(1-2), 9-20 Menendex, J., Sanchez, M., Uria, J., Martinez, E., Medel, A.**	**100µm PDMS**	**GC-FID**
506	BTEX in water	In-tube SPME-GC of volatile compounds in aqueous solution Analyst (Cambridge, UK), 1999, 124(5), 651-655 Tan, B, Marriott, P., Morrison, P., Lee, H.	1 meter capillary	GC-FID
117	Solvents, C2-C4 acids in water	Carbon Isotope Analysis of Semivolatile Organic Compounds in Aqueous Media Using SPME and Isotope Ratio Monitoring GC/MS Anal. Chem. 69: 944-950 (1997) Dias, R., Freeman, K.	polyacrylate, Carbowax, cyclodextrin 10-30 min stirring	GC-MS
225	Organochlorine semivolatiles in water	Application of Solid-Phase Microextraction to the Headspace GC Analysis of Semivolatile Organochlorine Contaminants in Aqueous Matrices J. Chromatogr. A 757: 173-182 (1997) Page, B., Lacroix, G.	100µm PDMS 87°C, 45 min headspace & immersion salt added	GC-ELCD
507	Polar organics in water	Analysis of organochlorine compounds in water by SPME/GC Fenxi Huaxue, 1999, 27(7), 768-772 Zhang, D, Zhou, Z., Tang, Y., Wu, C., Zhen, W. Xu, Y.	100µm PDMS 70°C, headspace Chinese	GC-ECD
151	BTEX in water	Protocol for the Analysis of High Concentrations of Benzene, Toluene, Ethylbenzene, and Xylene Isomers in Water Using Automated SPME-GC-FID Environ. Sci. Technol. 30: 1521 (1996) Thomas, S., Ranjan, S., Webster, G., Sarna, L.	100µm PDMS 5 min immersion	GC-FID

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
154	Organics in water	Solid Phase Microextraction Coupled to GC: A New Method for the Analysis of Organics in Water J. Chromatogr. A 733: 143 (1996) Eisert, R., Levson, K.	various fibers and conditions	GC-MS, AED
162	Surfactants in water	SPME Coupled with HPLC for Determination of Alkylphenol Ethoxylate Surfactants in Water Anal. Chem. 68: 1521 (1996) Boyd-Boland, A., Pawliszyn, J.	Carbowax/TPR 100 50 min immersion stirring	HPLC UV, 220nm
690	**Surfactant in water**	**Identification and characterization of Fenton oxidation products of surfactants by EMS and SPME-GC-MS Fatty alcohol polyethoxy sulfates. Rapid Commun, Mass Spectrom 2000, 14(10), 834-839 Cuzzola, A., Raffaelli, A., Saba, A., Salvadori, P.**		
508	Diethylphthalate in water	Trace determination of diethylphthalate in aqueous media by SPME-HPLC J. Chromatogr. A 841(1999) 177-185 Kelly, M., Larroque, M.	60µm DVB/PDMS 15 min immersed NaCl	HPLC UV, 226nm
588	Phthalates esters in water	In-tube SPME-LC analysis of phthalate esters in water samples Chromatography. Jun 1999; 20(2): 124-125 Saito,-Y; Nakao,-Y; Jinno,-K	40m x 0.25mm capillary	HPLC
691	**Phthalates esters in water**	**Determination of phthalate esters in water samples by SPME and GC with mass spectrometric detection J. Chromatogr. A (2000), 872 (1&2), 191-201 Penalver, A., Pocurull, E, Borrull, F., Marce, R.**	**85µm polyacrylate**	**GC-MS**
178	4-Nonylphenol in sea water	Determination of 4-Nonylphenol. Part 2: Orthogonal Array Design as a Chemometric Method for the SPME of 4-Nonylphenol in Water J. Microcolumn Sep. 8 (2): 131-136 (1996) Chee, K., Wong, M., Lee, H.	100µm PDMS 30 min immersion stirring	GC-FID
219	BTEX in water	Direct Solid Phase Microextraction for the Determination of BTEX in Water and Waste Water J. High Res. Chromatogr. 19: 472-474 (1996) Valor, I., Cortada, C., Molto, J.	100µm PDMS 10 min stirring	GC-FID
208	BTEX compounds in water	A New Porous-Layer Activated-Charcoal-Coated Fused Silica Fibre: Application for Determination of BTEX Compounds in Water Samples Using Headspace SPME and Capillary Gas Chromatography Chromatographia 45: 183-189 (1997) Djozan, D., Assadi, Y.	100µm charcoal coated fiber / PDMS 25°C, 15 min stirring salt added	GC-FID
169	Chlorinated 1,3-butadienes in water	Analysis of Chlorinated 1,3-Butadienes by SPME and GC-MS J. Chromatogr. A 737: 85-91 (1996) Fattore, E., Benfenati, E., Fanelli, R.	100µm PDMS 30 min immersion	GC-MS
692	**Styrene in water**	**SPME method for the quantitative analysis of styrene in water J. Chromatogr.Sci. (2000), 38(7), 315-318 Silva, F., DeCarvalho, C., Cardeal, Z.**	**85µm polyacrylate headspace**	**GC-FID**
170	Semivolatiles in water	Trends in Extraction of Semivolatile Compounds from Water for Environmental Analysis Anal. Commun. 33 (9): 15H-17H Poole, S., Poole, C.		

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
509	Semivolatiles in water	Studies of the composition of distillates from leachate by GC-MS coupled to SPME Rapid Commun. Mass Spectrom (1999), 13(10), 966-970 Saba, A., Pucci, S., Raffaekki, A., Salvadori, P.	pH 4 or 10 headspace/immersed	GC-ms
216	Petroleum hydrocarbons in water	Water Analysis by Solid-Phase Microextraction Based on Physical Chemical Properties of the Coating Anal. Chem. 69: 1992-1998 (1997) Saraullo, A., Martos, P., Pawliszyn, J.	100µm PDMS 30 min headspace stirring	GC-FID
272	BTEX	Application Methods of SPME for the Classification of BTEX GIT Labor-Fachz. 41 (12): 1191-1195 (1997) Van der Heide, M., Petry, P.		
273		SPME as a Method for Preparing Environmental Samples Pol. J. Environ. Stud. 6 (5): 5-12 (1997) Ligor, M., Buszewski, B.		
274		SPME in Pretreatment of Environmental Samples Huaxue Jinzhan 10 (1): 74-84(1998) Jia, J., He, Y., Huang, J.		
275	Aqueous samples	Direct SPME of Complex Aqueous Samples with Hollow Fiber Membrane Protection Anal. Commun. 33 (7): 219-221(1996) Zhouyao, Z., Poerschmann, J., Pawliszyn, J.		
693	**Semivolatiles in humic material**	**Sorption of very hydrophobic organic compounds onto PDMS and dissolve humic organic matter. 1. Adsorption or partitioning of VHOC on PDMS coated SPME fibers-never-ending story** **Environ Sci Technol 2000, 34, 3824-3830** **Poerschmann, J., Gorecki, T., Kopinke, G.**	**7um, 30um PDMS** **20 min**	
276	Phenols, PAHs in wastewater	SPME for Determining Distribution of Chemicals in Aqueous Matrixes Anal. Chem. 69 (4): 597-600 (1997) Zhang, A., Kopinke, G., Pawliszyn, J.	100µm PDMS 10 sec stirring	GC-MS
277	Chlorinated organics in water	Water Solubility and Octanol/Water-Partitioning of Hydrophobic Chlorinate Organic Substances Determined by Using SPME/GC Fresenius' J. Anal. Chem. 360 (1): 52-57 (1998) Paschke, A., Popp, P.		
278	Phenols in water	Determination of Phenols by Solid-Phase Microextraction J. Chromatogr. A 767 (1+2): 171-175 (1997) Bartak, P., Cap, L.	85µm polyacrylate 25°C, 60 min headspace pH 1, salt added	GC-FID
439	Chlorophenols in water	Determination of Chlorophenols Using SPME and GC/MS Ann. Chim. (Rome) (1998), 88(9-10), 629-635 Guidotti, M., Ravaioli, G.		GC-MS
279	VOCs in water	Pollution of Ground and Drinking Water with Volatile Organic Compounds, SPME and GC/MS Analysis Toxicol. Environ. Chem. 55 (1-4): 73-81 (1996) Hassan, A., Benfenati, E., Facchini, G., Fanelli, R.		GC-MS

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
280	Trihalomethanes in water	Determination of Trihalomethanes in Drinking Water by SPME-GC with Electron-Capture Detection Toxicol. Environ. Chem. 60(1-14): 39-45 (1997) Chen, M., Mao, I., Hsu, C.		GC-ECD
281	Chloroacetic acid esters in water	Determination of Chlorinated Acetic Acids in Drinking Water by in situ Derivatization and Solid Phase Microextraction Int. J. Environ. Anal. Chem. 66 (3): 215-224(1997) Aikawa, B., Burk, R.	30µm PDMS 1 min headspace stirring methanolic HCl added	GC-ECD
510	Sulfur compounds in water, N2 & propane	Studies on the application of SPME for analysis of volatile organic sulfur compounds in gaseous and liquid samples Chem. Anal. (Warsaw), 1999, 44(3A), 485-493 Wardencki, W., Namiesnik, J.		FPD-GC
339	Geosmin, 2-MIB in water	Rapid Analysis of Geosmin and 2-Methylisoborneol in Water Using SPME Procedures Water Research Vol. 32, No. 7, 2140-2146 (1998 Lloyd, S., Lea, J., Zimba, P., Grimm, C.	100µm PDMS 40°C, 30 min headspace, stirring salt added	GC-MS
362	2-MIB, geosmin in catfish	Analysis of 2-Methylisoboreneol and Geosmin in Catfish by Microwave Distillation-SPME J. Agri. Food Chem., 47, No. 1, pg. 164-169, 1999 Lloyd, S., Grimm, C.	100µm PDMS 40°C, 30 min headspace, stirring salt added	GC-MS
446	MIB & geosmin in water	Determination of Geosmin and 2-Methylisoboreneol in Water Using SPME and GC-Chemical Ionization/Electron Impact Ionization Ion Trap MS Analyst (Cambridge, U.K.) (1998), 123 (10), 2155-2160 McCallum, R., Pendleton, P., Scumann, R., Trinh, M.	80µm Carboxen/DVB/PDMS 60°C, 30 min headspace stirring salt added	GC-MS
511	34 Odor compounds in water	Headspace SPME for the determination of trace levels of taste and odor compounds in water samples Analyst (Cambridge, UK) 1999, 123(4), 459-466 Bao, M., Mascini, M., Griffini, O., Burrini, D., Santianni, D., Barbieri, K.	65µm DVB/PDMS 40 min @ 20°C NaCl, stirring immersion/headspace	GC-Ion trap MS
282	Chemical warfare compounds	On-Site Sample Work-Up Procedures to Isolate Chemical Warfare-Related Compounds, Using SPE & SPME Technology Analytical Chemistry Associated with the Destruction of Chemical Weapons NATO ASI Ser., Ser. 1 13: 65-76 (1997) Alcaraz, A., Hulsey, S., Whipple, R., Andresen, B.		
116	Nerve agents in water	Determination of Chemical Warfare Agents in Natural Water Samples by SPME Anal. Chem. 69: 1866-1872 (1997) Lakso, H., Ng, W.	65µm PDMS/DVB 30 min headspace saturated salt	GC-FID GC-MS
560	Chemical warfare agents in water	In-situ derivatisation of degradation products of chemical warfare agents in water by SPME and GC-MS analysis J. Chromatogr-A, Feb 1999, 832(1+2), 173-182 Sng, M., Ng., W.	65µm Carboxen/PDMS 20°C, N-methyl-N-(tert-butyl dimethylsilyl) trifluoro-acetamide derivative	GC-MS
283	Volatiles in wastewater	Rapid Determination of Volatile Organic Compounds in Environmentally Hazardous Wastewaters, Using SPME Anal. Chem. 358 (7-8): 833-837 (1997) James, K., Stack, M.		

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
284	TNT, DNT salt in seawater/ sediment	Trace salt Signatures from World War II Unexploded Undersea Ordinance Environ. Sci. Technol. 32 (9): 1354-1358 (1998) Darrach, M., Chutjian, A., Plett, G.	65µm PDMS/DVB 15 min pH 8 agitation	directly into MS
285	Aromatic amines in water	Determination of Aromatic Amines by SPME-GC-MS in Water Samples J. Chromatogr. A 791(1+2): 221-230 (1997) Muller, L., Fattore, E., Benfenati, E.	65µm Carbowax/DVB 30 min stirring pH 7.6, salt added	GC-MS
578	Aromatic amines in water	SPME coupled with HPLC for the determination of aromatic amines. Anal-Chem. 15 Jan 1999; 71(2): 310-318 Wu,-Y-C; Huang,-S-D	65µm PDMS/DVB, CW-TPR	HPLC-UV 280nm
286	Volatiles in water	Inter-Laboratory Studies for the Validation of SPME for the Quantitative Analysis of Volatile Organic Compounds Compounds in Aqueous Samples Anal. Chim. Acta 356 (2-3): 113-123 (1997) Nilsson, T., Ferrari, R., Facchetti, S.	100µm PDMS 30 min headspace & immersion stirring	GC-ECD
597	Volatiles (BTEX) in water	Solid-phase micro-extraction of volatiles from water using open cap vials Chromatographia. May 1999; 49(9-10): 513-519 Matisova,-E; Sedlakova,-J; Simon,-P; Welsch,-T	100µm PDMS 5 min. @ 25C stirred	GC-FID
287	VOCs, pesticides in water and air	Capabilities for the Direct Determination of Triphenyl- and Triethylarsine in Water by SPME Followed by GC-A Amer. Environ. Lab, 9 (10): cover, 5-6 (1997) Mothes, S., Wennrich. R.	Carboxen/PDMS, 100µm PDMS various conditions	GC-MS
374	Organoarsenicals in water and soil	Determination of Organoarsenicals in the Environment by SPME-GC-MS J. Chromatogr. A 807 (1998) 253-263 Szostek, B., Aldstadt, J.	100µm PDMS 10 min immersion methyl thioglycolate (derivative)	GC-MS
288	Iodinated volatiles in water	SPME with Temperature-Programmed Desorption for the Analysis of Iodinated Disinfection Byproducts Anal. Chem. 70 (3): 638-644 (1998) Frazey, P., Barkley, R., Siever, R.	85µm polyacrylate 15 min immersion stirring	GC-ECD
289	Chloroethers in water	Determination of Chloroethers in Aqueous Samples, Using SPME Acta Hydrochim. Hydrobio. 25 (6): 329-334 (1997) Wennrich, L., Engewald, W., Popp, P.		GC-FID or MS
513	Chloroethers in water	GC trace analysis of haloethers in water: Comparison of different extraction techniques Int. J. Environ.Anal. Chem (1999), 73(1), 31-41 Wennrich, L., Engewald, W., Popp, P.		GC-FID or MS
514	Aliphatic aldehydes in water/oil	Influence of extraction parameters and medium on efficiency of SPME sampling in analysis of aliphatic aldehydes J. Chromatogr., A 1999, 845(1+2), 337-347 Keszler, A., heberger, K.	100µm PDMS 30 min @ 40°C immersed/headspace	GC-MSD
515	Glycerol ethers in water	Improved extraction of glycerol ethers from water by SPME by Carboxen-PDMS coated fiber Chromatogrophia, 1999, 50 (3/4), 155-159 Bensoam, J., Cicolella, A., Durjardin, R.	75µm Carboxen/PDMS 25°C, sat. NaCl immersed	GC-FID

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
516	Amines/alcohols in water	Evaluation of SPME for the anlaysis of hydophilic compounds J. Exposure Anal.Environ. Epidemiol. 1999, 9(3) 181-191 Shoemaker, J. Munch, J., Behmer, T.	75µm Carboxen/PDMS	
517	Polar volatiles in water	SPME of volatile polar compounds in water J. High Resolut. Chromatogr. (1999), 22(2), 109-115 Matisova, E, Sedlakova, J., Slezackova, M., Welsch, T.	85µm polyacrylate 50°C headspace	GC-MS
290	VOCs, pesticides in water and air	On-Site Sampling for Volatiles and Pesticides, Using SPME Amer. Environ. Lab. 10 (2): 21-22 (1998) Shirey, R., Mani, V, Mindrup, R.	100µm PDMS, 75µm Carboxen/PDMS 2-3 min, headspace stirring, salt added	GC-MS
291	Petroleum hydrocarbons in water	Solvent-Free and Rapid Determination of Petroleum Hydrocarbons in Water by SPME UFZ-Ber. Optimierung Umweltvertiraeglicher Analysenverfahren fuer Mineraloelkohlenwasserstoff IM Boden 12: 14-17 (1997) Christall, B.		
367	C3-C16 hydrocarbons in water	Partition Infrared Method for Total Gasoline Range Organics in Water Based on SPME Environ. Sci. Technol, 1999, 33, 814-819 Stahl, D., Tilotta, D.	130µm Teflon film 30 min immersion	IR 4000-2690 cm-1
518	MMT in water	Determination of methylcyclopentadienylmanganese tricarbonyl (MMT) in aqueous samples by SPME-GC-AED Analyst (Cambridge, UK), (1999), 124(1), 71-73 Yang, F., Chau, Y.	100µm PDMS 15 min @ 20°C headspace	GC-AED
519	VOCs, BTEX, pesticides, PCBs from water	Efficiency of direct SPME from water: Comparison of different fiber types including a new C8-coating Chromatographia, 1999, 49(11/12), 686-690 Popp, P., Paschke, A.	variety of fibers	
512	Iodinated THMs in drinking water	SPME for the determination of iodinated trihalomethanes in drinking water J. Chromatogr., A (1999), 841(2), 197-206 Cancho, B., Ventura, G., Galceran, M.	65µm CW/DVB/PDMS 10 min @ 20°C NaCl used	GC-ECD
292	Iodinated organics in water	Solid Phase Microextraction and Analysis of Iodinated Organic Compounds Avail. UMI, Order No. DA9812871 from: Diss. Abstr. Int., B 58 (10): 5364 (1998) Frazey, P.	85µm polyacrylate	GC-ECD
288	Iodinated volatiles in water	SPME with Temperature-Programmed Desorption for the Analysis of Iodinated Disinfection Byproducts Anal. Chem. 70 (3): 638-644 (1998) Frazey, P., Barkley, R., Siever, R.	85µm polyacrylate 15 min immersion stirring	GC-ECD
694	**Cyanogen chloride in water**	**Simultaneous determination of cyanogen chloride and cyanogen bromide in treated water at sub-ug/L levels by a new SPME-GC-ECD method J. Chromatogr. A 897(2000) 307-315 Cancho, B., Ventura, F., Galceran, M.**	**Carboxen/DVB/PDMS 15 min, headspace 2-3pH, 25% salt added**	**GC-ECD**
695	**Acetic acid in water**	**Determination of acetic acid in aqueous samples, by water-phase derivatization, SPME, and GC J. Chromatogr. A., (2000), 874(2), 225-234 Wittmann, G., Van Langenhove, H., Dewulf, J.**	**85µm Polyacrylate headspace benzenal bromide derv.**	**GC-FID**

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
411	Chloroacetic acids in water	Determinationof Chlorinated Acetic Acids in Drinking Water by in-situ Derivatization-SPME Interri J. Environ. Anal. Chem. 66: 215-224 (1997) Aikawa, B., Burk, R.		
520	Haloacetic acids in water	SPME coupled with GC-ion trap mass spectrometry for the analysis of haloacetic acids in water J. Chromatogr., A 1999, 859(2), 159-172 Sarridon, M., Santos, F., Galceran, M.		GC-Iontrap MS
696	**Haloacetic acids in water**	**In situ derivatization/SPME for the determination of haloacetic acids in water Anal. Chem. 2000 Oct. 15, 72(20), 4865-4873 Sarrion, M. Santos, F., Galceran, M.**	**Carboxen/PDMS headspace dimethyl sulfate derv.**	**GC-ITMS**
353	Chlorobenzenes in water	Using SPME to Determine Partition Coefficients to Humic Acids and Bioavailable Concentrations of Hydrophobic Chemicals Environ.Sci Technol, 1998, 32, 3430-3435 Ramos, E., Meijer, S., Vaes, W., Verhaar, H., Hermens, J.	7µm PDMS 20 min immersion pH 7	GC-FID
576	Chlorobenzenes in water	SPME-capillary GC determination of chlorobenzene compounds in water Lihua-Jianyan,-Huaxue-Fence. Mar 1999; 35(3): 103-105 Yang,-HB	100µm PDMS 5 min, agitated 0.5gm NaOH immersed	GC-ECD
697	**Chlorinated benzenes in water**	**Trace analysis of ten chlorinated benzenes in water by headspace SPME J. Chromatogr. A (2000) 874(1), 149-154 He, Y., Wang, Y., Lee, H.**	**100µm PDMS headspace salt, agitated**	**GC-MS**
698	**Fungicides in water**	**Determination of fungicides in natural waters using SPME and GC coupled with ECD and MS detection J. Chromatorgr A., 893 (2000), 143-156 Lambropoulou, D., Konstantinou, I., Albanis, T.**	**100µm PDMS 30 min, agitated 20% NaCl, pH 4 immersed**	**GC-MS**
699	**Chlorothalonil in water**	**Determination of aqueous chlorothalonil with SPME-GC J. Chromatogr. A, 896 (2000) 105-110 Chen, S., Su, Y., Jen, J.**	**100µm PDMS 40 min, salt added, stirred**	**GC-ECD**
293	Acidic herbicides in water	Gas-Phase Post-Derivatization Following SPME for Determining Acidic Herbicides in Water Anal. Chem. 70 (9): 1963-1968 (1998) Lee, M., Lee, R., Lin, Y., Chen, C., Hwang, B.	85µm polyacrylate 50 min immersion, stirring pH 1, salt added diazomethane (deriv.)	GC-MS
521	Fungicides in water	SPME of the antifouling Irgarol 1051 and fungicides dichlofluanid and 4-chloro-3-methylphenol in water samples J. Chromatogr. A, (1999), 839(1+2), 253-260 Penalver, A., Pocurull, E., Borrull, F., Marce, R.	85µm polyacrylate 1 hr. @ 60°C immersion, salt added	GC-MS
568	T2 mycotoxin in water	Determination of trichothecene (T2 mycotoxin) in aqueous sample with solid-phase microextraction technique followed by GC-FID J-High-Resolut-Chromatogr. Jul 1999; 22(7): 424-426 Lee,-PK; Kee,-SYK; Ng,-W; Gopalakrishnakone,-P	85µm polyacrylate 75 min, immersed satr. salt stirred	GC-FID
294	PAHs in water	SPME of PAHs from Aqueous Samples, Using Fibers Coated with HPLC Chemically Bonded Silica Stationary Phases Anal. Chem. 69 (24): 5001-5005 (1997) Liu, Y., Lee, M., Hageman, K., Yang, Y, Hawthorne, S.	100µm silica/epoxy 60°C, 30 min headspace	GC-FID, -MS

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
295	PAHs	Separation and Determination of Polycyclic Aromatic Hydrocarbons by SPME/Cyclodextrin-Modified Capillary Electrophoresis Anal. Chem. 69 (9): 1726-1731 (1997) Nguye, A., Luong, J.		
700	**PAHs in water**	**Monitoring of PAH in water using headspace SPME and capillary GC Microchem J. (1999), 63(2), 276-284 Djozan, D., Assadi, Y.**		
701	**PAHs in water**	**SPME for determining the distribution of sixteen USEPA polycyclic aromatic hydrocarbons in water samples J. Chromatogr. A. (2000) 879, 177 Doong, R., Chang, S., Sun, Y.**		
296	Aromatics in water	Determination of Aromatic Compounds in Water by SPME and Ultraviolet Absorption Spectroscopy Anal. Chem. 69 (1): 1197-1203 (1997) Wittkamp, B., Hawthorne, S., Tilotta, D.	PDMS chip 30-50 min immersion	UV spectroscopy 220-300nm
344	RDX, TNT metabolites in salt water	Trace Analysis of salt in Seawater Using SPME and GC-Ion Trap Mass Spectrometry Anal. Chem., Vol. 70, No. 14, July 15, 1998, pg. 3015-3020 Barshick, S., Griest, W.	Carbowax/DVB 10 min immersion stirring	GC-MS
297	Phthalates, surfactants in water	Characterization of Water-Soluble Components of Slurries Using SPME Coupled to LC-MS J. Microcolumn Sep. 10 (2): 225-234 (1998) Moeder, M., Popp, P., Pawliszyn, J.	65µm Carbowax/TPR 1-15 hr. pH 2, satr. salt	LC-MS
598	Organophosphorus compounds in leachate	Comparative studies of the leachate of an industrial landfill by GC-MS,LC-nuclear magnetic resonance and LC-MS J-Chromatogr,-A. 29 Jan 1999; 831(2): 243-256 Benfenati,-E; Pierucci,-P; Fanelli,-R; Preiss,-A Godejohann,-M; Astratov,-M; Levsen,-K; Barcelo,-D		GC-MS
702	**Fatty acids in waste water**	**Development of a headspace SPME procedure for the determination of free volatile fatty acids in waste water J Chromatogr. A,(2000) 873(1), 107-115 Abalos, M., Bayona, J., Pawliszyn, J.**	**85µm Carboxen/PDMS headspace stirring**	**GC-FID, MS**
703	**Fatty acids in water**	**Application of GC coupled to chemical ionisation MS following headspace SPME for the determination of free volatile fatty acids in aqueous samples. J. Chromatogr. A 891 (2000) 387-294 Abalos, M., Bayona, J.**	**85µm Carboxen/PDMS 20 min headspace 3.75 g NaCl, pH 1.5**	**GC-CI-MS**
593	Fatty acids in waste water	Analysis of volatile fatty acids in waste water collected from a pig farm by a SPME method. Chemosphere. Feb 1999; 38(4): 823-834 Yo,-S-P	65µm Carbowax/DVB 20 min immersion stirred	GC-MS
704	**Volatile, semivolatiles in water & soil**	**Solid Phase microextraction: a promising technique for sample preparation in environmental analysis J. Chromatogr. A 889 (2000) 3-14 Alpendurada, M.**	**review article**	

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
Pesticides				
441	Pesticides in water	Determination of Pesticides in Aqueous Environmental Samples via SPME (Solid-Phase Microextraction) GIT Frachz. Lab. 39: 25-26 (1995) Eisert, R., Levsen, K.		
522	Pesticides in water	Quantitative analysis of pesticides in water by SPME coupled with Mass Spectrometry Spectra. Anal. 1999, 28(208), 23-29 Massat, F. Laurent, A.	100µm PDMS, 65µm DVB/PDMS 30 min agitated	GC-MS
523	Organochlorine & organophosphorus in water/ethanol	A Systematic Approach to Optimize SPME determination of Pesticides in Ethanol/Water mixtures used as Food Simulates Anal. Chem. (1999), 71(13), 2417-2422 Batlle, R, Sanchez, C., Nerin, C.		
442		Solid-Phase Microextraction (SPME) GIT Frachz. Lab. 39: 325-331 (1995) Popp, P., Kauert, A., Kalbitz, K.		
123	Organophosphorus pesticides in water	Pesticide Analysis by SPME Am. Env. Lab. April 1997, pp 20-22 Eisert, R., Gorecki, T., Pawliszyn, J.	100µm PDMS 60 min immersion	GC-FID
104	Insecticides, fungicides in water	Influence of Ethanol on Pesticide Extraction in Aqueous Solutions by SPME J. Agric. Food Chem. 44: 3871-3877 (1996) Urruty, L., Montury, M.	100µm PDMS 30 min headspace	GC-MS
122	Pesticides in water	Simultaneous Determination of 60 Pesticides in Water Using SPME and GC/MS Analyst 121: 929-938, July 1996 Boyd-Boland, A., Magdic, S., Pawliszyn, J.	100µm PDMS 50 min immersion stirring, salt added	GC-MS
241	Nitrogen- & phosphate-pesticides in water	Solid-Phase Microextraction of Nitrogen- and Phosphorus-Containing Pesticides from Water and GC Analysis Environ. Sci. Technol. 30: 3259-3265 (1996) Choudhury, T., Gerhardt, K., Mawhinney, T.	100µm PDMS 60 min immersion stirring, salt added	GC-NPD
52	Pesticides in water	Determination of Organophosphorus, Triazine, and 2,6-Dinitroanailine Pesticides in Aqueous Samples via SPME and GC with NPD Detection Fresenius J. Anal. Chem. 351: 555-562 (1995) Eisert, R., Levsen, K.	100µm PDMS, 85µm polyacrylate 25 min immersion stirring, salt added	GC-NPD
443	Organophosphate pesticides in water	Simple Extraction of Organophosphate Pesticides Using (SPME) Before Capillary Gas Chromatography Hochudoku 13 (2): 122-123 (1995) Lee, X., Kumazawa, T., Taguchi, T., Sato, K., Suzuki, O.		GC-NPD, -MS
167	Organophosphorus insecticides in water	Analysis of Organophosphorus Insecticides from Environmental Samples Using SPME J. Chromatogr. A 736: 219-228 (1996) Magdic, S., Boyd-Boland, A., Jinno, K., Pawliszyn, J.	85µm polyacrylate 60°C, 60 min immersion salt added	GC-NPD
93	Organophosphorus pesticides in water	Matrix Effects on SPME of Organophosphorus Pesticides from Water J. Chromatogr. A 767: 195-203 (1997) Valor, I., Molto, J., Apraiz, D., Font, G.	85µm polyacrylate 60°C, 45 min immersion stirring	GC-NPD

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
118	Organophosphorus pesticides in water	Solid Phase Microextraction of Organophosphorus Pesticides from Water J. Chromatogr. A 759: 225-230 (1997) Sng, M., Lee, F., Lakso, H.	65µm PDMS/DVB 30 min immersion	
524	Organophosphorus pesticides in water	Determination of organophosphorus pesticides in water using GC-MS Qim. Nova (1999), 22(2), 197-200 Silva, F., Cardeal, Z., De Carvalho, C.	100µm PDMS Portuguese	GC-MS
350	Organophosphorus pesticides in food plant	The Application of SPME in the Analysis of Organophosphorus Pesticides in a Food Plant Environ Sci. Technol. 1998, 32, 3816-820 Chen, W., Poon, K., Lam, M.	100µm PDMS 90 min immersion (water)	GC-FPD
525	Pyrethrins in insect spray, shampoo, flowers	Heterogenic catalytic hydrolysis and analysis of natural pyrethrins in subcritcal water coupled w/SPME-GC-MS Fresenius'J. Anal. Chem. 1999, 364(7), 625-630 Krappe, M, Hawthorne, S., Weclawiak, B.	100µm PDMS 20 min @ pH 2 immersed	GC-FID or MSD
705	**Pyrethroids in water**	**SPME of pyrethroid pesticides from water at low and sub-ppt levels at different temperature J.High Resolut.Chromatogr. (2000), 23(7/8), 485-488 Barrionuevo, W., Lancas, F.**	**100µm PDMS 5 min 40-90°C**	**GC-ECD**
299	Organophosphorus pesticides in water	Online Determination of Organophosphorus Pesticides in Water by SPME and GC with Thermionic-Selective Detection J. High Resolut. Chromatogr. 20 (9): 487-492(1997 Lopez-Avial, V., Young, R., Becker, W.	30µm PDMS 30 min immersion stirring	GC-TCD
390	Organophosphorus pesticides in water	SPME for quantitative analysis of organophosphorus Pesticides in Environmental Water Samples J. Chromatogr. A 808 (1998) 257-263 Beltran, J., Lopez, F., Hernandez, F.	100µm PDMS, 85µm polyacrylate 30 min stirring, salt added	GC-NPD
706	**Pesticides in water**	**SPME for the determination of systemic and non-volatile pesticides in river water using GC with NPC and ECD J. Chromatogr. A 893(2000) 347**		**GC-NPD ECD**
707	**Nitrogen herbicides in water**	**Use of SPME for the Quantitative determination of Herbicides in soil and water samples Anal. Chem. 2000, 72, 2313-2322 Hernandez, F., Beltran, J., Lopez, F, Gaspar, J.**	**Carbowax DVB 30 min salt added, stirred**	**GC-MS SIM mode**
28	Nitrogen herbicides in water	Solid Phase Microextraction of Nitrogen-Containing Herbicides J Chromatogr. 704: 163-172 (1995) Boyd-Boland, A., Pawliszyn, J.	85µm polyacrylate 50 min immersion pH 2, salt added	GC-NPD
53	Triazine herbicides in water	Automated Determination of S-Triazine Herbicides Using Solid-Phase Microextraction J. Chromatogr. 705: 305-312 (1995) Barnabas, I., Dean, J., Fowlis, I., Owen, S.	100µm PDMS 15 min (manual) 3 min (automated) immersion	GC-NPD
177	Triazine herbicides	Determination of Triazine Herbicides in Environmental Samples J. Chromatogr. 733: 295-335 (1996) (review) Dean, J., Wade, G., Barnabas, I.	100µm PDMS 10 min immersion (water)	GC-NPD
111	Triazine herbicides in water	Validation of SPME for the Analysis of Triazine Herbicides at ppt Level in Aqueous Samples J. Chromatogr. A. 795 (1998) 371-376 Nilsson, T., Ferrari, R., Basta, R., Dellavedova, P.	Carbowax/DVB 30 min immersion, stirring salt added	GC-NPD, GC-MS

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
708	**Urea herbicides in water**	**Indirect analysis of urea herbicides from environmental water using solid phase microextraction J. Chromatogr. A. 890 (2000) 303-312 Berrada, H., Font,G., Molto, J.**	**85µm polyacrylate immersed sat. salt, pH 4**	**GC-NPD**
231	Pesticides	Minimization of Solvent Consumption in Pesticide Residue Analysis J. Chromatogr. A 754: 43-47 (1996) Wan, H., Wong, M.	overview article	
156	Organochlorine pesticides in water	Online Determination of Organochlorine Pesticides in Water by SPME and GC-ECD J. High Res. Chromatogr. 19: 247 (1996) Young, R., Lopez-Avila, V., Beckert, W.	100µm PDMS 20 min immersion stirring	GC-ECD
180	Chlorinated pesticides in water	Optimization of a Technique of SPME and Capillary GC with ECD for the Determination of Nine Organochlorine Pesticides in Drinking Water Analusis 25 (3): 51-54 (1997) Almeida, M., Conceicao, P., Alpendurada, M.		GC-ECD
709	**Chlorinated pesticides in water**	**Application of SPME and GC with ECD for the analysis of chlorinated pesticides in water Spectra Anal (2000) 29(213) Boussahel, R., Bouland, S., Montiel, A., Moussaoui, K**	**100µm PDMS 20min.**	**GC-ECD**
710	**Organochlorine pesticides in water**	**Monitoring organochlorine pesticides from landfill leachates by GC-ECD detection after solid phase microextraction J. Chromatogr. A 891 (2000) 305-311 Bras, I., Santos, L., Alves, A.**	**100µm PDMS 30 min @ 55°C immersion stirring**	**GC-ECD**
711	**Organochlorine pesticides in herbs**	**SPME for organochlorine pesticides residues analysis in Chinese herbal formulations J. Chromatogr. A 891 (2000) 305-311**		
43	Organophosphorus pesticides in water	Element-Selective Detection of Pesticides by Gas Chromatography-Atomic Emission Detection and SPME J. Chromatogr. A 683: 175-183 (1994) Eisert, R., Levsen, K., Wunsch, G.	100µm PDMS 20 min immersion	GC-AED
526	Organophosphorus in water	Determination of organophosphorus pesticides in water by SPME Talanta (1999), 49(2), 393-402 Su, P., Huang, S.	85µm polyacrylate	GC-FPD
712	**Pesticide residue various matrices**	**Solid Phase microextraction in pesticides residue analysis J. Chromatogr. A 885 (2000) 389-404 Beltran, J., Lopez, F., Hernandez, F.**	**review article**	
713	**Pesticides in water**	**An approach to solventless sample preparation procedure for pesticide analysis using SPME/supercritical fluid extraction technique Anal. Chim. Acta 2000, 418(1), 69-77 Salleh, S., Saito, Y., Jinno, K.**		**HPLC**
87	Pesticides in water	Determination of Pesticides in Aqueous Samples by SPME In-Line Coupled to Gas Chromatography-Mass Spectrometry Am. Soc. Mass Spectrom. 6: 1119-1130 (1995) Eisert, R., Levsen, K.		GC-MS

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
157	Contaminants in water	Development of a Prototype System for Quasi-Continuous Analysis of Organic Contaminants in Surface or Sewage Water Based on In-Line Coupling of SPME to GC J. Chromatogr. A 737: 59 (1996) Eisert, R., Levsen, K., Wuensch, G.	85µm polyacrylate 10 min immersion	GC-FID
77	Metolachlor in water	Solid Phase Microextraction of the Herbicide Metolachlor in Runoff and Tile Drainage Water Samples J. Chromatogr. A 725: 129 (1996) Webster, G., Gaynor, J., Ng, H., Graham, J., Sama, L.	100µm PDMS 15 min immersion stirring	GC-ECD
193	Metolachlor in water	Comparative SPE, SPME, and Immunoassay Analysis of Metolachlor in Surface Runoff and Tile Drainage J. Agric. Food Chem. 44: 2736-2741 (1996) Graham, K., Ng, H., Tan, C., Gaynor, J., Cancilla, D., Webster, G., Drury, C., Welacky, T., Sarna, L.	100µm PDMS 15 min immersion stirring	GC-ECD
112	Polar herbicides	Application of SPME Coupled with HPLC for Analysis of Polar Herbicides Request from Environmental Institute, European Commission Joint Research Centre, 21020 Ispra (Va) Italy Nilsson, T.		HPLC
190	Pesticides in water	Analysis of Pesticides in Environmental Water Sample by SPME-HPLC J. Chromatogr. 754: 137-144 (1996) Jinno, K., Muramats, T., Saito, Y., Kiso, Y., Magdic, S., Pawliszyn, J.	85µm polyacrylate 60°C, 60 min immersion salt added	HPLC-UV 220nm
242	Pesticides in water	Pesticides by Solid-Phase Microextraction: Results of Round Robin Test Analyst (Cambridge) 121: 1381-1386 (1996) Gorecki, T., Mindrup, R., Pawliszyn, J.	100µm PDMS 45 min immersion stirring	GC-MS
438	Pesticides in water	SPME and GC for Rapid Analysis of Pesticides Aanalusis (1998), 26(6), M137-M143 Miege, C., Dugay, J.	Review	GC-MS
298	Chlorinated pesticides	Analysis of Organochlorine Pesticides by SPME J. Chromatogr. A 723: 111-112 (1996) Magdic, S., Pawliszyn, J.	100µm PDMS 90 min immersion salt added	GC-MS, -NPD
527	Organochlorine pesticides in water	Optimization of SPME conditions using a response surface methodology to determine organochlorine pesticides in water by GC-ECS J. Chromatogr. A (1999), 844(1+2), 425-432 Aguilar, C., Penalver, A, Pocurull, E., Ferre, J., Borrull, F., Marce, R.	85µm polyacrylate 45 min @ 60°C immersed agitated	GC-ECD
300	Pesticides in water	Effect of Various Parameters Governing SPME for the Trace Determination of Pesticides in Water J. Chromatogr., A 795 (1): 27-42 (1998) Dugay, J., Miege, C., Hennion, M.	65µm PDMS/DVB 25°C, 30 min immersion pH 7, salt added	GC-NPD
301	Pesticides in water	SPME and GC-MS Detection for the Determination of Pesticides in Aqueous Samples J. Chromatogr. A. 795 (1): 105-115 (1998) Aguilar, C., Penalver, S., Pocurull, E., Borrull, F., Marce, R.	85µm polyacrylate 55°C, 45 min immersion stirring, salt added	GC-MS

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
528	Pesticides in water	Analysis of some pesticides in water samples using SPME-GC with different Mass Spectrometric techniques J. Chromatogr, A, 859(2): 193-202 (1999) Natangelo, M., Tavazzi, S., Fanelli, R., Befenatti, E.		GC-MS
714	**Fentin in environmental samples**	**Headspace SPME capillary GC-ICP-MS for the determination of the organotin pesticide fentin in environmental samples** **J.Anal. At. Spectrom. (2000), 15(6), 651-656** **Vercauteren, J., DeMeester, A, DeSmaele, T. Vanhaecka, F., Moens, L., Dams, R., Sandra, P.**	**100µm PDMS** **10-20 min** **75-85°C** **NaBEt4** **pH 8**	**GC-ICP-MS**
445	Pesticides in water	Analysis of Pesticides in Environmental Water Samples by SPME-HPLC J. Chromatogr. A 754 (1+2): 137-144 (1996) Jinno, L., Muramatsu, T., Saito, Y., Kiso, Y., Magdic, S., Pawliszyn, J.	85µm polyacrylate 60°C, 60 min immersion stirring, salt added	HPLC-UV 220nm
587	Pesticides	Study on solventless sample preparation of pesticides with SPME-SFE technique. Chromatography. Jun 1999; 20(2): 126-127 Selleh,-SH; Saito,-Y; Jinno,-K	85µm polyacrylate 3 hr @ 60°C	HPLC-UV
715	**Biologically active substance in water**	**SPME-GC-MS of biologically active substance in water samples** **J. Chromatogr. A., (2000) 873(1), 95-106**	**85µm polyacrylate** **65µm Carbowax/DVB** **30 min**	**GC-MS**
223	PCBs in water	SPME and Headspace SPME for the Determination of PCBs in Water Samples Anal. Chem. 1998, 70, 2510-2515 Llompart, M., Fingas, M., Li, K.	100µm PDMS 100°C, 30 min headspace/immersion stirring	GC-MSD
Soil				
36	Hexachlorocyclohexane in soil	Application of SPME and GC with Electron-Capture and Mass Mass Spectrometric Detection for the Determination of Hexachlorocyclohexanes in Soil Solutions J. Chromatogr. 687: 133-140 (1994) Popp, P., Kalbitz, K., Opperman, G.	100µm PDMS 20-30 min immersion stirring	GC-ECD, GC-MS
74	Diesel fuel in soil	Solid Phase Microextraction-GC for Analysis of Diesel Fuel Residues in Soil Request from Dept. Soil Science, University of Manitoba Winnipeg, MB, Canada R3T 2N2. Graham, K., Webster, B., Sarna, L.	100µm PDMS 55°C, 30 min headspace	GC-FID
716	**THF, methanol in distillate**	**Analysis of THF and methanol in distillation residue samples by automated headspace SPME-GC with FID** **J Chromatogr. Sci. (2000), 38(3), 117-121** **Gavlick, W.**	**65µm PDMS/DVB**	**GC-FID**
717	**PAHs in soil**	**Solid Phase Microextraction of PAHs from soil** **Chem. Ana., 2000 (45 No.6) 835-842** **Sedukiene, I., Vickackaite, V., Kazlauskas, R.**		
567	PAHs in soil	Chemical characterization and screening of hydrocarbon pollution in industrial soils by headspace SPME J-Chromatogr,-A. 2 Jul 1999; 848(1-2): 279-295 Havenga,-WJ; Rohwer,-ER	100µm PDMS 40 min headspace	GC-MS

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
75	Pesticides in soil	Extraction of Pesticides by Solid Phase Microextraction (from Soil) Request from: Dept. Environmental Assessment, Swedish University of Agricultural Sciences, PO Box 7050, Uppsala, Sweden Bengsson, S., Berglof, T.	100µm PDMS immersed, water solution	GC-ECD, -NPD
529	Triazines, carbamates in soil leachates	Determination of polar pesticides in soil by SPME couple to HPLC-MS Fresenius'J. Anal. Chem. (1999), 363(7), 680-685 Moder, M., Popp, P., Eisert, R., Pawliszyn, J.	85µm polyacrylate salt added	HPLC-MS
718	**Triazines, in soil leachates**	**Determination of triazines in soil leachates by SPME coupled to GC-MS** **J. Chromatogr. A 2000, 874(2), 247-255** **Zambonin, C.., Palmisano, F.**		**GC-MS**
530	Organophosphorus pesticides in soil	Determination of organophosphorus pesticides in soil by headspace SPME Fresenius'J. Anal. Chem (1999), 363(7), 673-679 Ng, W., Teo, M., Lakso, H.	85µm polyacrylate 1 hr @ 80°C headspace over soil	GC-FID
76	Lindane in water and soil	Analysis of Lindane in Water and Soil by Solid Phase Microextraction Request from: Dept. Soil Science, University of Manitoba, Winnipeg MB, Canada R3T 2N2. Anderson, K., Sarna, L., Webster, B.	30µm & 100µm PDMS 58°C 40 min (headspace) 15-20 min (immersion)	GC-ECD
92	Chlorobenzenes in soil and water	Analysis of Chlorobenzenes in Soils by Headspace SPME and GC-Ion Trap MS J. Chromatogr. A 771: 181-189 (1997) Santos, F., Sarrion, M., Galceran, M.	100µm PDMS headspace	GC-Ion Trap MS
238	Chlorobenzenes, nitrobenzenes, anilines in soil, water	Analysis of Chloro- and Nitroanilines and Benzenes in Soil by Headspace Solid-Phase Microextraction J. Chromatogr. A 746: 71-81 (1996) Fromberg, A., Nilsson, T., Larsen, R., Montanarella, L., Facchetti, S., Madsen, J.	85µm polyacrylate headspace 50°C, 30 min	GC-ECD
97	Semivolatiles in solids	Coupled Subcritical Water Extraction with SPME for Determining Semivolatile Organics in Environmental Solids Anal. Chem. 68: 3892-3898 (1996) Hageman, K., Mazeas, L., Grabanski, C., Miller, D., Hawthorne, S.	100µm PDMS 15 min immersion	GC-MS
719	**Chlorophenols in soil**	**Determination of chlorophenols in soil using accelerated solvent extraction combined with SPME** **Anal. Chem. (2000), 72(3), 46-551** **Wennrich, L, Popp, P., Moeder, M.**		**GC-MS**
531	Volatiles and semivolatiles in soils/water	Headspace SPME for the determination of volatile and semivolatile pollutants in soils Talanta (1999), 48(2), 451-459 Llompart, M., Li, K., Fingas, M.	100µm PDMS 30 min @ 20°C headspace	GC-MSD
532	PAHs, hydrocarbons in pollutant crust	Investigation by SPME and GC-MS of organic films on stone monuments Rapid. Commun. Mass Spectrom. (1999), 13(10), 895-900 Angelis, F., Di Tullio, A., Mellerio, G., Quaresima, R, Volpe, R		GC-MS
533	Aldehydes, acids from palmitic acid	Degradation of palmitic (Hexadecanoic) acid deposited on TiO2 coated self cleaning glass: kinetics of disappearance, intermediate products and degradation pathways New J. Chem (1999), 23(4), 365-374 Romeas, V., Pichat, P., Guillard, C., Chopin, T., Lehaut, C.		

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
534	PAHs in organic matter	Interaction between natural organic matter (NOM) and polycyclic aromatic compounds, Comparison of fluorescence quenching and SPME Fresenius'J. Anal. Chem. (1999), 364(4), 313-319 Myung, S., Kim, M., Min, H., Yoo, E. Kim, K.	85µm polyacrylate 30 min pH3, immersed alkyl formate derivative	GC-MS
172	Elemental analysis of soil	Elemental and Organometallic Analysis of Soil Using Glow-Discharge MS and GC-MS Rapid Commun. Mass Spectrom. 10: 341-346 (1996) Barshick, C., Barshick, S., Mohill, M., Britt, P., Smith, D.	100µm PDMS 50°C, 10 min salt added	GC-MS
174	Mercury species in natural gas condensate	Performance Improvements in the Determination of Mercury Species in Natural Gas Condensate Using Online Amalgamation Trap or SPME with Capillary GC-Microwave-Induced Plasma Atomic Emission Spectrometry Analyst 121: 1055-1060 (1996) Snell, J., Frech, W., Thomassen, Y.		GC-ICP
535	Organomercury in soil and water	SPME and GC-MIP-AED for the speciation analysis of organomercury compounds J. High Resolut. Chromatogr. (1999), 22(3), 181-182 Mothes, S., Wennrich, R.		GC-MIP-AED
239	BTEX, chlorinated hydrocarbons in soil	The Determination of Volatile Organic Compounds in Soils Using SPME with Gas Chromatography-Mass Spectrometry J. High Res. Chromatogr. 19: 515-519 (1996) James, K., Stack, M.	100µm PDMS 5 min headspace	GC-MS
197	VOCs in water and sediment	Environmental Analysis of Volatile Organic Compounds in Water and Sediment by GC J.Chromatogr. A 733A 733: 119-141 (1996) (review) Kuran, P., Sojak, L.	overview article	
536	VOCs in sediment	Determination of VOC contamination in borehole sediments by headspace SPME-GC analysis Fresenius' J. Anal. Chem 1999, 364(7), 645-647 Dermietzel, Jurgen, Strenge, G.	water solution headspace	
720	**Butyltin in water**	**Determination of butyltin compounds in aqueous samples by GC w/FPD and headspace SPME after in-situ hydride derivatization Aanl. Sci. 2000, 16(6), 585-588 Jiang, G, Liu, J.**	**NaBEt4 Japanese**	**GC-FID**
721	**Butyltin in water**	**Determination of butyltin species in water and sediment by SPME-GC-FID J.Chromatogr. A (2000), 873(1), 61-71 Millan, E., Pawliszyn, J.**	**NaBEt4**	**GC-FID**
722	**Butyl-, phenyltin in water**	**SPME: a new procedure for the control of butyl- and phenyltin pollution in the environment by GC-FID Analyst (Cambridge, UK) 2000, 125(2), 263-268 Aguerre, S., Montigny, C, Lespes, G., Gaultier, M.**	**100µm PDMS 60 min, immersed NaBEt4**	**GC-FID**
199	Organotin in humic organic matter	Solid Phase Microextraction to Study the Sorption of Organotin Compounds onto Particulate and Dissolved Humic Organic Matter Environ. Sci. Technol. 31: 3629-3636 (1997) Poerschmann, J., Kopinke, F., Pawliszyn, J.	100µm PDMS 30 min immersion	GC-MS
343	Methylmercury derivative in soil	Development of a Technique for the Analysis of Inorganic Mercury salts in Soils by GC-MS Intl. J. Mass Spectrometry 178 (1998) 31-41 Barshick, C., Barshick, S., Britt, P., Lake, D., Vance, M., Walsch, E.	100µm PDMS, 65µm PDMS/DVB 50°C, 5 min stirring, salt added methyl bis(dimethyl-gloximate) pyridinecobalt (III)	GC-MS

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
723	**Methylmercury derivative in soil**	**Determination of methylmercury by SPME-ICP-MS: a new sample introduction method for volatile metal species J. Anal. AT. Spectrom (2000) 15(7), 837-842 Mester, Z., Lam, J., Sturgeon, R, Pawliszyn, J.**		**ICP-MS**
209		Applications of Sorbent Extraction in Environmental Analysis Chem. Anal. (Warsaw) 42 (3): 297-314 (1997) Gorlo, D., Namiesnik, J., Zygmunt, B.		
303	PCBs in ocean & leachate water	Coupled Subcritical Water Extraction with SPME for Determining Semivolatile Organics in Environmental Solids Anal. Chem. 69: 801 (1997) Hageman, K., Mazeas, L., Grabanski, C, Miller, D., Hawthorne, S.	100µm PDMS 15 min immersion	GC-ECD
304	PCBs in soil	Solid-Phase Microextraction of Polychlorinated Biphenyls J. Chromatogr. A 800 (2): 257-266 (1998) Yang, Y., Miller, D., Hawthorne, S.	100µm PDMS 15 min immersion	GC-ECD
370	PCBs in soil	Adsorption versus Absorption of PCBs onto SPME Coatings Anal. Chem. 1998, Vol. 70, 1866-1869 Yang, Y., Hawthorne, S., Miller, D.	7µm PDMS 5 hr immersion stirring, salt added	GC-ECD
537	PCBs in soil & sediment water slurry	Headspace SPME for the determination of PCBs in soils and sediments J. Microcolumn Sep. (1999), 11(6), 307-402 Llompart, M., Li, K., Fingas, M.	100µm PDMS 30 min @ 100°C headspace	GC-MS
724	**PAHs in sediment**	**Determination of PAHs in sediment using SPME w/GC-MS J. Chromatogr. Sci. (2000), 38(2), 55-60 Cam,D., Gagni, S., Meldolesi, L., Galletti, G.**	**100µm PDMS**	**GC-MS**
538	Bisphenol A in water	An attempt by SPME with on-column silylation for a rapid and highly sensitive determination of bisphenol A Bunseki Kagaku (1999) 48(6), 589-593 Takao, Y. Lee, H., Arizono, K.	BSTFA derivative Japanese	GC-MS
305		SPME of Semivolatile Organic Compounds from Odoriferous Samples Hazard. Ind. Wastes (28th) 734-738 (1996) Wojtowicz, C., Clifton, A., Willy, D.		
Air				
725	**Organic vapors in gaseous matrices**	**Application of SPME for determination of organic vapors in gaseous matrices J. Chromatogr. A, 885(2000) 405-418 Namiesnik, J., Zygmunt, B., Jastrzebska, A.**	**review article**	
726	**Volatiles in air**	**Airflow Rate in the Quantitation of Volatiles in Air Streams by Solid Phase Microextraction Anal. Chem 2000, 72, 3949-3955 Bartelt, R., Zilkowski, B.**	**100µm PDMS 30 min**	**GC-FID**
727	**Volatile organic in air**	**Sorbent trapping of volatile organic compounds from air J. Chromatogr. A, 885 (2000) 120-151 Harper, M.**	**Carboxen/PDMS review article**	
55	BTEX in air	Analysis of Environmental Air Samples by Solid Phase microextraction and GC/Ion Trap Mass Spectrometry Environ. Sci. Technol. 29: 693-701 (1995) Chai, M., Pawliszyn, J.	100µm PDMS 3 min gas sampling	GC-MS

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
226	Petroleum hydrocarbons in air	Estimation of Air-Coating Distribution Coefficients for SPME Using Retention Indexes from Linear Temperature-Programmed Capillary Gas Chromatography. Application to the Sampling and Analysis of Total Petroleum Hydrocarbons in Air Anal. Chem. 69: 402-408 (1997) Martos, P., Saraullo, A., Pawliszyn, J.	100µm PDMS, 30µm PDMS 30-480 min	GC-FID
375	Formaldehyde derivatives in air	Sampling and Determination of Formaldehyde Using SPME with On-Fiber Derivatization Anal. Chem. 198, 70, 2311-2320 Martos, P., Pawliszyn, J.	65µm PDMS/DVB 10-150 sec gas sampling PFBHA derivatives	GC-MS
110	Amines in air	Determination of Amines in Air and Water Using Derivatization Combined with SPME J. Chromatogr. A 773: 249-260 (1997) Pan, L., Chong, M., Pawliszyn, J.	65µm Carbowax/DVB 30 min gas sampling DPTFA derivatives	GC-FID
539	Thiol and sulfides in air samples	Evaluation of SPME for sampling of volatile organic sulfur compounds in air for subsequent GC analysis with atomic emission detection J. Chromatogr., A 1999, 848(1+2), 305-315 Haberhauer-Troyer, C., Rosenberg, E., Grasserbauer, M	75µm Carboxen/PDMS	GC-AED
540	Sulfur compounds in water/ N2 & propane	Studies on the application of SPME for analysis of volatile organic sulfur compounds in gaseous and liquid samples Chem. Anal. (Warsaw), 1999, 44(3A), 485-493 Wardencki, W., Namiesnik, J.	100µm PDMS 10 min	FPD-GC
233	C5-C11 hydrocarbons, BTEX in air	Calibration of Solid-Phase Microextraction for Air Analyses Based on Physical Chemical Properties of the Coating Anal. Chem. 69: 206-215 (1997) Martos, P., Pawliszyn, J.	30µm & 100µm PDMS 15-450 sec gas sampling	GC-FID
541	Chlorobenzen and p-xylene in air	On Calibration of SPME-GC-MS system for analysis of organic air contaminants using gaseous standard mixtures Chem. Anal. (Warsaw) (1999), 44(2), 201-213 Namiesnik, J., Gorlo, D, Wolska, L, Zygmunt, B.	Optimization of sampling	GC-MS
308	Organic vapors in air	Calibration Procedure for SPME-GC Analysis of Organic Vapors in Air Talanta 44 (9): 1543-1550 (1997) Gorlo, D., Wolska, L., Zygmunt, B., Namiesnik, J.		
574	Solvents in air	Application of SPME to monitoring indoor air quality. Fresenius'-J-Anal-Chem. Apr 1999; 363(7): 696-699 Gorlo,-D; Zygmunt,-B; Dudek,-M; Jaszek,-A; Pilarczyk,-M; Namiesnik,-J	100µm PDMS 15 min	GC-MS
542	Organic pollutants in air	Application of SPME to monitoring indoor air quality Fresenius' J. Anal. Chem. (1999), 363(7), 696-699 Gorlo, D., Zygmunt, B., Dudek, M., Jaszek, A, Pilarczyk, M., Maniesnik, J.	100µm PDMS	GC-MS
543	Organic vapors in Air	Time-Weighted Average Sampling with SPME Device; Implications for Enhanced Personal Exposure Monitoring to Airborne Pollutants Anal. Chem. (1999), 71(8), 1513-1520 Martos, p. Pawliszyn, J.	100µm PDMS	
306	VOCs in water and air	Application of Solid Phase Microextraction for Determination of Volatile Halogenated Hydrocarbons in Air and Water of an Indoor Swimming Pool Fresenius' Environ. Bull. 5 (1+2): 55-60 (1996) Czerwinski, J., Zygmunt, B., Namiensnik, J.		

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
307	Pollution in air	A Case Study of Indoor Pollution by Chinese Cooking Toxicol. Environ. Chem. 65 (1-4): 217-224 (1998) Benfenati, E., Pierucci, P., Niego, A.		
347	VOCs in air	Nonequilbrium Quantitation of Volatiles in Air Stream by SPME Anal. Chem. Vol. 71, January 1, 1999, pg. 92-101 Bartelt, R., Zilkowski, B.	7µm, 30µm, 100µm PDMS 27°C, 30 min gas sampling	GC-FID
544	Volatiles in atmosphere	The sampling and analysis of volatile organic compounds in the atmosphere React. Hudrocarbons Atmos. (1999), 119-157 Boob, Academic, Coden: 67ERAQ Cao, X, Hewitt, C.		
545	Volatile organics in air	Analysis of volatile organic compounds in the ambient air of Algiers by GC with a beta-cyclodextrine capillary column J. Chromatogr A, 1999, 846(1+2), 287-293 Yassaa, N., Meklati, B., Cecinato, A.		

Theory / Technique

2	VOCs, BTEX, PAHs in water	Solid Phase MicroExtraction with Thermal Desorption Using Fused Silica Optical Fibers Anal. Chem. 62: 2145 (1990) Arthur, C., Pawliszyn, J.	56µm PDMS 2 min stirring salt added	GC-FID, GC-ECD
5	BTEX in water	Solid Phase MicroExtraction: An Attractive Alternative Environmental Lab. 11, Dec/Jan 1992/1993 pp 10-15 Arthur, C., Killam, L., Chai, M., Buchholdz, K., Potter, D., Zhang, Z., Pawliszyn, J.	100µm PDMS 14 min stirring salt added	GC-FID
9	BTEX in water	Automation and Optimization of Solid Phase MicroExtraction Anal. Chem. 64: 1960-1966 (1992) Arthur, C., Killam, L., Buchholz, K., Pawliszyn, J.	56µm & 100µm PDMS 2-40 min stirring, salt added	GC-FID
12	BTEX in water	Solventless Injection Technique for Microcolumn Separations J. Microcolumn Sep. 5: 51-56 (1993) Arthur, C., Chai, M., Pawliszyn, J.	100µm PDMS	GC-MS
13	BTEX, PAHs in water	Headspace Solid Phase MicroExtraction Anal. Chem. 65: 1843-1852 (1993) Zhang, Z., Pawliszyn, J.	56µm PDMS 1-5 min headspace	GC-FID
16	Nitroaromatics in water	Practical Use of Automated Solid Phase Extraction Amer. Lab. Nov. 1993, p18 Berg, J.	100µm PDMS 1-20 min immersion	GC-FID
17	Toluene in water	On-Line Monitoring of Flowing Samples Using SPME-GC Anal. Chim. Acta 284: 265 (1993) Motlagh, S., Pawliszyn, J.	56µm PDMS 20 min immersion, stirring	GC-FID
21	Phenols in water and air	Optimization of Solid Phase MicroExtraction (SPME) Conditions for Phenol Analysis Anal. Chem. 66: 160-167 (1994) Buchholz, K., Pawliszyn, J.	85µm polyacrylate 40 min immersion & headspace pH 2, salt added acetate derivatives	GC-MS
204	Phenols	Determination of Phenols by Solid-Phase Microextraction J. Chromatogr. A 767: 171-175 (1997) Bartak, P., Cap, L.		

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
391	Phenols, PAHs in water	SPME for Determining the Binding State of Organic Pollutants in Contaminated Water Rich in Hujic Organic Matter J. Chromatogr. A, 816 (1998) 159-167 Porschamann, J., Kopinke, F., Pawliszyn, J.	7µm PDMS 50°C, 90-180 min headspace stirring	GC-MS
24	PAHs in soil and water	Silica-Fiber microextraction for Laser Desorption Ion Trap Mass Spectrometry Anal. Chem. 66: 1897-1901 (1994) Cisper, M., Earl, W., Nogar, N., Hemberger, P.	Trimethlysilyl coated fiber 3 min	MS
27	PAHs in water	Solid Phase microextraction Coupled to HPLC Anal. Chem. 67: 2530-2533 (1995) Chen, J., Pawliszyn, J.	15µm PDMS 6-60 min immersion	HPLC-UV
222		Potential Applications of Coupled SPME-HPLC LaborPraxis 20 (11): 66-68, 71 (1996) Haag, I.		HPLC
33	Fatty acids, PAHs, pesticides in methanol/water	Solvent-free Sample Introduction for Supercritical Fluid Chromatography Using Polymer Coated Fibers J. Microcolumn Res. 42: 1925-1930 (1994) Hirat, Y., Pawliszyn, J.	15µm PDMS, 85µm polyacrylate 5 min immersion	GC-FID
35	BTEX in water	Headspace SPME vs. Purge & Trap for the Determination of Substituted Benzenes in Water J. Chromatogr. Sci. 32: 317-322 (1994) MacGillevra, B.	100µm PDMS 40°C, 50 min headspace stirring, salt	GC-FID
38	BTEX in water	Quantitative Extraction Using an Internally Cooled Solid Phase MicroExtraction Device Anal. Chem. 67: 34-43 (1995) Zang, Z., Pawliszyn, J.	50µm PDMS 22-80°C, 2-5 min headspace	GC-MS
43	Organophosphorus pesticides in water	Element-Selective Detection of Pesticides by Gas Chromatography Atomic Emission Detection and Solid Phase MicroExtraction J. Chromatogr. 683: 175-183 (1994) Eisert, R., Levser, K., Winsch, G.	100µm PDMS 20 min immersion	GC-AED
44	BTEX in water	Solid-Phase Microextraction: A Solvent-Free Alternative for for Sample Preparation Anal. Chem. 66: 844A-853A (1994) Zang, Z., Yang, M., Pawliszyn, J.	polyacrylate, PDMS immersion, salt	GC-FID
45	BTEX in water and air	New Solvent-Free Sample Preparation Techniques ES &T 28 (13): 569A-574A (1994) Boyd-Boland, A., Chai, M., Luo, Y. Zhand, Z. Yang., M., Pawliszyn, J.	Various fibers and extraction conditions	GC-FID,E1858 GC-MS
213		A New Separation and Extraction Method -- Solid-Phase Microextraction Sepu (Chinese) 15 (2): 118-119 (1997) Liu, J.		
56		SPME GIT Fachz. Lab. 39: 325-362 (1995) Popp, P.		
57	BTEX in water	Sample Introduction Approaches for Solid Phase MicroExtraction-Rapid GC Anal. Chem. 67: 3265-3274 (1995) Gorecki, T., Pawliszyn, J.		GC-FID

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
58	BTEX in water	Solid Phase MicroExtraction/Isothermal GC for Rapid Analysis of Complex Organic Samples J.High Res.Chromatogr. 18 (2): 161-166 (1995) Gorecki, T., Pawliszyn, J.	15µm PDMS 2 min headspace stirring	GC-FID
59	Semivolatiles in water	SPME as a Method for Estimating the Octanol Water Partition Coefficient Anal. Chem. 68: 130-133 (1996) Dean, J., Tomlinson, W., Makovskaya, V., Cumming, R., Hetheridge, M., Comber, M.	85µm polyacrylate min to 20 hr immersion, stirring	GC-FID
546	PAHs in water and octanol-water	Solubility and partitioning studies with PAHs using an optimized SPME procedure Fresenius' J. Anal. Chem. (1999), 363(4), 426-428 Paschke, A., Popp, P., Schueuermann, G.	100µm SPME stirred	GC-MS
728	**PAHs in waste water**	**Determination of PAHs in waste water by off-line coupling SPME with column liquid chromatography J. Chjromtogr. A, 897(2000) 153-159 Popp, P., Bauer, C., Moder, M., Paschke, A.**	**100µm PDMS 60 min**	**HPLC fluorescence**
547	Pesticides in water	Extracted amounts by SPME: a realistic approach to the partition coefficient K. J. Chromtogr. Sci. 1999, 37(8), 277-282 Urruty, L., Montury, M		
548	Volatiles in water	Determination of Henry's law coefficient by combination of the equilibrium partitioning in closed systems and SPME techniques J. Chromatogr, A., (1999), 830(2), 353-363 Dewulf, J., Van Langenhove, H., Everaert, P	100µm PDMS 30 min @ varied temp.	GC-FID
237	Organics in water and air	Partitioning of Organic Chemicals to Polyacrylate-Coated Solid-Phase Microextraction Fibers: Kinetic Behavior and Quantitative Structure-Property Relationships Anal. Chem. 68: 4458-4462 (1996) Vaes, W., Hamwik, C., Ramos, E., Verhaar, H., Hermens, J.	85µm polyacrylate immersion stirring	GC-FID, -ECD GC-MS
84		Solid Phase Microextracting Using Fused-Silica Fibers Coated with Graphitized Carbon Black Chromatographia 41: 678-684 (1995) Mangani, R., Cenciarini, R.		
88	Overview	New Direction in Sample Preparation for Analysis of Organic Compounds Trends Anal. Chem. 14 (3): 113-122 (1995) Pawliszyn, J.	Multiple applications	
121	Eugenol, 2,4-dimethylphenol, 2-phenylethanol in water	Solid Phase Microextraction for Quantitative Analysis in Nonequilibrium Situations Anal. Chem. 69: 1230-1236 (1997) Ali, J.	85µm polyacrylate 1-160 min immersion, stirring salt added	GC-MS
360	2-Octanol in water	SPME in Headspace Analysis, Dynamics in Non-Steady State Mass Transfer Anal. Chem., 70: 4822-4826, (1998) Ali, J.	85µm polyacrylate, 100µm PDMS headspace	GC-MS
214	Strawberries and apples in fruit homogenate	Solid-Phase Microextraction: Artifact Formation and Its Avoidance Chromatographia 46: 63-66 (1997) Verhoeven, H., Beuerle, T., Schwab, W.	85µm polyacrylate 30 sec immersion	GC-MS

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
139	McReynolds probes in methanol	Studying Activity Coefficients of Probe Solutes in Selected Liquid Polymer Coatings Using SPME J. Phys. Chem. 100: 17648 (1996) Zhang, Z., Pawliszyn, J.	7µm PDMS 25-100°C, 15 min headspace	GC-FID
729		**Multiple solid phase microextraction** **J. Chromatogr. A. (2000) 878, 27**		
579	BTEX and solvents in water	Study of polymer coatings for solid-phase microextraction Sepu. Jan 1999; 17(1): 10-13 Zhang,-DN; Wu,-CY; Ai,-F	88µm PDMS	
148	Maillard reaction products in water	A Study of the Behavior of Maillard Reaction Products Analyzed by SPME-GC-Mass Selective Detection J. Chromatogr. Sci. 34: 213 (1996) Coleman III, W.	100µm PDMS 5 min immersion stirring	GC-MS
207	Alkyl & alkoxy aroma & flavor compounds in water	A Study of the Behavior of Polar and Nonpolar SPME Fibers J. Chromatogr. Sci. 35 (6): 245-258 (1997) Coleman, W.	100µm PDMS 5 min immersion & headspace stirring, salt added	GC-MSD
730	**Inorganic anions in water**	**SPME of inorganic anions based on polypyrrole film** **Analyst (Cambridge, UK), 2000, 125(3), 391-394** **Wu, J., Yu, Z, Lord, H., Pawliszyn, J.**	**Polypyrrole film**	**Ion Chrom.**
163	Mercury, mercury compounds in water	SPME Combined with Electrochemistry Anal. Commun. 33: 361 (1996) Guo, F., Gorecki, T., Irish, D., Pawliszyn, J.	10µm gold on carbon steel electrode 5 min gas phase sampling stirring, KNO3 added	GC-MS
182		Use of SPME with Ion Mobility Spectrometry Anal. Lett. 30 (7): 20-22 (1997) Orzechowsa, G., Poziomek, E., Tersol, V.		GC-MS
228	VOCs in seawater	SPME of Volatile Organic Compounds. Estimation of the Sorption Equilibrium from the Kovats Index Effect of Salinity and Humic Acids and the Study of the Kinetics by the Development of an "Agitated/Static Layer" Model J. Chromatogr. A 761: 205-217 (1997) Dewulf, J., Everaert, M., Van-Langenhove, H.	100µm PDMS 45 min immersion stirring salt added	GC-FID
165	Triazines, organic pesticides in sewage water	Development of a Prototype System for Quasi-Continuous Analysis of Organic Contaminants in Surface or Sewage Water Based on In-Line Coupling of SPME to GC J. Chromatogr. A 737 (1): 59-65 (1996) Eisert, R., Levsen, K.	85µm polyacrylate 10 min 300mL/min flow	GC-ECD, -FID
166	Pesticides in water	Design of Automated SPME for Trace Analysis of Organic Compounds in Aqueous Samples J. Chromatogr. A 776: 293-303 (1997) Eisert, R., Pawliszyn, J.	100µm PDMS 30 min stirring	GC-FID
184	BTEX, pesticides in water	Sample Preparation for GC with SPE & SPME Chromatogr. 37: 205-236 (1997) Penton, Z.	100µm PDMS 2-20 min immersion, stirring salt added	GC-FID

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
236	Aromatic hydrocarbons in water	Porous-Layer Solid-Phase Microextraction Using Silica Bonded Phase Anal. Chem. 69: 190-195 (1997) Liu, Y., Shen, Y., Lee, M.	30µm C8 silica bonded metal fiber 20 min stirring	GC-FID
189	PAHs in water extract	High Temperature Water Extraction Combined with SPME Anal. Commun. 33: 421-424 (1996) Daimon, H., Pawliszyn, J.	30µm PDMS 70 min stirring	GC-FID
220	C6-C11 hydrocarbons in water	Initial Bandwidth Resulting from Splitless and Solid-Phase Microextraction Gas Chromatographic Injections J. High Res. Chromatogr. 20 (2): 77-80 (1997) Snow, N., Okeyo, P.	100µm PDMS 10 min immersion stirring	GC-FID
138	PAHs in water	Optimizing Split/Splitless Injection Port Parameters for SPME J. Chromatogr. A 740 (1): 139-145 (1996) Langenfeld, J., Hawthorne, S., Miller, D.	7µm & 100µm PDMS 5 hr immersion, stirring	GC-FID
211	Nitro musk compounds in cosmetic products	Nitro Musks in Cosmetic Products: Determination by Headspace SPME and GC with Atomic Emission Detection: Dynamics of Organic Compound Extraction from Water, Using Liquid-Coated Fused Silica Fibers Chromatogrphia 45; 138-144 (1997) Struppe, C., Schaefer, B., Engewald, W.	100µm PDMS 1-60 min headspace	GC-AID
243		Dynamics of Organic Compound Extraction from Water, Using Liquid-Coated Fused Silica Fibers Anal. Chem. 66: 1186-1199 (1994) Arthur, C., Pawliszyn, J.		
437	Review	SPME and Its Utilization in Environmental Analysis Chem. Listy (1998), 92(8), 633-642 Sedlakova, J., Matisova, E., Slezackova, M.		
549	Review of 52 refs.	Trends in SPME for determining organic pollutants in environmental samples Trends Anal. Chem. 1999, 18(8), 557-568 Penalver, A., Pocurull, E., Borrull, F., Marce, R.	Varied	
550	Proceeding of Extech	Advances in Extraction Technology: A report from Extech '99 LC-GC Current Trends and development in Sample Prep, Sept. 1999, Vol. 17., No. 90, S25-S30 Lord, H., Pawliszyn, J.	Varied	
551	Overview of SPME	Sample Preparation for GC with SPE and SPME Advances in Chromatography, Vol. 37, 1966, 205-236 Book chapter by M. Dekker, New York, 1996 Penton, Z.		
244		Solid Phase Microextraction -- A Unique Tool for Chemical Measurements Can. J. Chem. 74: 1297-1308 (1996) Gorecki, T., Boyd-Boland, A., Zhang, Z., Pawliszyn, J.		
245		Solvent Free Sample Preparation Techniques Based on Fiber and Polymer Technologies Environ. Sci. Technol. 28: 569A-574A (1994) Boyd-Boland, A., Chai, M., Luo, Y., Zhang, Z., Yang, M., Gorecki, T., Pawliszyn, J.		

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
246	BTEX, pesticides in water	Solid Phase Microextraction Tech. Aquat. Toxicol. 459-477 (1996) Webster, G., Sarna, L., Graham, K.	100µm PDMS 10-30 min immersion stirring	GC-FID, -ECD
247		Solid Phase Microextraction Technique for Gas Chromatography Huaxue 54 (3): 119 (1996) Huang, S.	overview article	
248	BTEX, pesticides in water	Sample Preparation for Gas Chromatography with SPE and SPME Adv. Chromatogr. (N.Y.) 37: 205-236 (1997) Penton, Z.	100µm PDMS 2-20 min immersion, stirring salt added	GC-FID
249	BTEX, pesticides in water	Solid Phase Microextraction-SPME, State of the Art Chromatography Kaiser, O. (Ed.) Incom, Dusseldorf, pp153-166 (1997) Kern, H., Penton, Z.	100µm PDMS 2-20 min immersion, stirring salt added	GC-FID
250	Reference book	Solid Phase Microextraction: Theory and Practice VCH, New York, 275pp (1997) Pawliszyn, J.	various fibers and conditions	
731	**Reference book**	**Applications of Solid Phase Microextraction Edited by Janusz Pawliszyn RSC Chromatography Monographs**	**35 applications described**	
732	**Overview**	**Theory of solid phase microextraction J. Chromatogr. Sci. (2000), 38(7), 270-278 Pawliszyn, J.**		
733		**Researchers are giving SPME a second look R&D Magazine, February 1999, 44-45**	**30:50 Carboxen/DVB/PDMS headspace**	**GC-FID**
251	Overview	Sample Preparation and Solid-Phase Extraction LC-GC 15: 1106, 1108, 1110-1113, 1116-1117 (1997) Majors, R., Raynie, D.	no fibers or conditions shown	
252	Formaldehyde, surfactants in air and water	Recent Advances in Solid Phase Microextraction LC-GC May Supplement, ppS41-S46 (1998) Lord, H., Pawliszyn, J.	65µm PDMS/DVB, Carbowax/TPR fiber varied conditions	GC-MS, HPLC-UV
255	Thiophenes in water	Application of SPME/GC-MS to Characterize Metabolites in the Biodesulfurization of Organosulfur Model Compounds in Gitumen Environ. Sci. Technol. 32 (3): 421-426 (1998) MacPherson, T., et al.	85µm polyacrylate 20 min immersion pH 2	GC-MS
256		Construction of an Interface for SPME-PC-SFC J. High Resolut. Chromatogr. 34 (10): 275-277 (1997) Medvedovici, A., Sandar, P.		
257	Phenylurea pesticides in water	Automated In-Tube SPME Coupled to HPLC Anal. Chem., Vol. 69, No. 16, August 15, 1997, 3141-3147 Eisert, R., Pawliszyn, J.	Omegawax 250 25µL, 10 flush cycles	HPLC-UV, 245nm
258	PAHs in water	Effect of Heating the Interface on Chromatographic Performance of SPME Coupled to HPLC Anal. Commun. 34 (11): 365-369 (1997) Daimon, H., Pawliszyn, J.	100µm PDMS 60 min immersion heat desorb 22-180°C	HPLC-UV, 254nm

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
259	PAHs in water	Effect of Heating the Interface on Chromatographic Performance of SPME Coupled to HPLC Analyst (Cambridge) 122 (11): 365-369 (1997) Daimon, H., Pawliszyn, J.	100µm PDMS 60 min immersion heat desorb 22-180°C	HPLC-UV, 254nm
260	Hg (II) ion in water	SPME Combined with HPLC for the Determination of Metal Ions Using Crown Ether as Selective Extracting Reagent J. Microcolumn Sep. 167-173 (1998) Jia, C., Luo, Y., Pawliszyn, J.	polypropylene hallow fiber, 30 min immersion derivative: dibenzo-18-crown-6	HPLC-UV, 254nm
734	**Dopamine in biological matrix**	**Analysis of biogenic amines by SPME and HPLC with electrochemical detection J. Chromatogr. A, (2000) 873, 396 Auger, J., Boulay, R., Jaillais, B., Delion-Vancassel, S.**	**Carbowax-TPR**	**HPLC electrochem**
368	Aromatic amines in wastewater	SPME Coupled with HPLC for the Determination of Aromatic Amines Anal. Chem., Vol. 71, No. 2, January 15, 1999, 310-316 Wu, Y., Huang, S.	Carbowax/TPR, PDMS/DVB 30 min or 20 min Na2SO4 buffer added	HPLC-UV, 280nm
407	Phenylurea pesticides in water	Automated In-Tube SPME Coupled to HPLC Anal. Chem., Vol. 69, No. 16, August 15, 1997, 3141-3147 Eisert, R., Pawliszyn, J.	Omegawax 250 25uL, 10 flush cycles	UV, 245nm
735	**Carbamate pesticides in water**	**Automated in-tube SPME-HPLC for Carbamate pesticide analysis J. Chromatogr. A, (2000) 873(1), 137-147 Gou, Y, Eisert, R., Pawliszyn, J.**	**Intube capillaries**	**HPLC**
736	**Carbamate pesticides in water**	**In-tube SPME coupled to capillary LC for Carbamate analysis in water samples Anal. Chem. 2000, 72(13), 2774-2779 Gou, Y., Pawliszyn, J.**	**Intube capillaries**	**HPLC**
737	**Carbamate pesticides in water**	**On-line coupling of in-tube SPME to HPLC for analysis of carbamates in water samples: comparison of two commercially available autosampler J. Microcolumn Sep. (2000), 12(3), 125-134 Gou, Y., Tragas, C., Lord, H., Pawliszyn, J.**	**Intube capillaries**	**HPLC**
571	175 references review	On-line combination of aqueous-sample preparation and capillary gas chromatography J-Chromatogr,-A. 21 May 1999; 842(1-2): 391-426 Louter,-AJH; Vreuls,-RJJ; Brinkman,-UAT	various references of SPME & SPE	
552		Solid phase microextraction turned inside out Che. Aust. 1999, 66(6), 9-11 Tan, D., Marriott, P., Lee,H., Morrison, P.	Intube capillaries	
412		Solventless Analytical Separation Method -- SPME/Microcolumn LC Chromatography (1998), 19(2), 6063 Jinno, K.		HPLC
261	Fatty acid methyl esters in air and water	Derivatization/SPME: New Approach to Polar Analytes Anal. Chem. 69: 190-195 (1997) Pan, L., Pawliszyn, J.	85µm polyacrylate 2 hr headspace, pH 6 derivative: 1-pyrenyl-diazomethane	GC-FID

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
553	9 references	New Gas chromatographic approach to polar compounds by derivatization-SPME Bunseki, 1999 (7), 595-597 Takauchi, M.	Japanese	
262	Alcohol and ketones in water	Strategies for the Analysis of Polar Solvents in Liquid Matrixes Anal. Chem. 70 (1): 19-27 (1998) Gorecki, T., Martos, P., Pawliszyn, J.	Nafion fiber 10 min headspace stirring	GC-ECD
738	**Hydrophobic compounds in water**	**Absorption of hydrophobic compounds into the poly(dimethylsiloxane) coating of SPME fibers: high partition coefficients and fluorescence microscopy images** **Anal. Chem. (2000) 72(3), 459-464** **Mayer, P., Vaes,W., Hermens, J.**	**100µm PDMS**	
739	**Hydrophobic compounds in water**	**Nonequilibrium SPME for determination of the freely dissolved concentration of hydrophobic organic compounds: matrix effects and limitations** **Anal. Chem 2000, 72(13), 2802-2808** **Oomen, A., Mayer, P., Tolls, J.**		
263	nC8 to nC14, neat	Methodological Aspects of Headspace SPME. Application J. High Resolut. Chromatogr. 20 (4): 217-221 (1997) Schafer, B. Hennig, P., Engewald, W.	various fibers 80°C, 5 min headspace	GC-FID
264	Phenol, alcohols in water	Headspace SPME. Dynamics and Quantitative Analysis Before Reaching a Partition Equilibrium Anal. Chem. 69 (16): 3260-3266 (1997) Ali, J.	85µm polyacrylate 1-80 min at 25°C, 1-40 min at 80°C headspace stirring	GC-MS
413	Tetraethyllead in water	SPME as a Sample Introduction Technique for Radio Frequency Glow Discharge MS Anal. Commun. (1997), 34(10), 275-277 Gorecki, T., Belkin, M., Caruso, J., Pawliszyn, J.	30µm PDMS 5 min headspace, stirred	radio frequency glow discharge MS
265		Effect of Sample Volume on Quantitative Analysis by SPME, Part 1 - Theoretical Considerations Analyst (Cambridge) 122 (10): 1079-1086 (1997) Gorecki, T., Pawliszyn, J.		
740		**Kinetics of SPE and SPME in thin adsorbent layer with saturated sorption isotherm** **J.Chromatogr. A (2000) 873(1), 39-51** **Emenov, S, Koziel, J., Pawliszyn, J.**		
266	Organics in water	SPME as a Tool to Determine Membrane/Water Partition Coefficients and Bioavailable Concentrations in vitro Systems Chem. Res. Toxicol. 10 (10): 1067-1072 (1997) Vae, W., et al.	85µm polyacrylate 9-17 min immersion, stirring	GC-FID
267	PAHs, phenols, anilines in water	Sol-Gel Coating Technology for the Preparation of SPME Fibers of Enhanced Thermal Stability Anal. Chem. 69 (19): 3889-3898 (1997) Chong, S. et al.	Solgel coating 30 min stirring	GC-FID
741	**BTEX, herbicides in water**	**High-performance polyethylene glycol-coated SPME fibers using sol-gel technology** **J. Chromatogr. A 893 (2000) 157-168** **Wang, Z., Xiao, C., Wu, C., Han, H.**	**PAG sol-gel fiber** **30°C, headspace** **salt added, pH adjusted**	

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
554		Sol-gel method for the preparation of SPME fibers Anal. Lett., 1999, 32(8), 1675-1681 Zhou, Z., Wang, Z., Qu, C., Zhan, W., Xu, Y.	Solgel coatings	
268	BTEX in soil	Field-Portable SPME/Fast GC for Trace Analysis Field Anal. Chem. Technol. 1 (5): 277-284 (1997) Gorecki, T., Pawliszyn, J.	30µm PDMS 2 min, headspace, stirring	GC-FID, -PID
555		Optimization of the SPME device design for field applications Fresenius' J. Anal. Chem. 1999, 364(7), 610-616 Muller, L., Gorecki, T., Pawliszyn, J.	varied coatings	
742	**Equipment design**	**Fiber Conditioners for SPME: Design, Testing, and application J.High Resol. Chromatogr. 2000, 23(4) 343-347 Koziel, J., Shurmur, B., Pawliszyn, J.**		
269	Organics in air and water	New Trends in SPME Crate. Rev. Anal. Chem. 27 (2): 103-135 (1997) Eisert, R., Pawliszyn, J.	various fibers and conditions	GC, HPLC
556	Review of technique	Solid Phase Microextraction TrAC, Trends Anal. Chem. (1999), 18(4), 272-282 Prosen, H., Zupancic-Kralj, L.,		
270	C6-C16 hydrocarbons in water	Optimizing SPME-GC Injections LC-GC 15 (12): 1130-1136 (1997) Okeyo, P., Snow, N.	7µm, 30µm, 100µm PDMS 10 min stirring	GC-FID
403	PAHs in water	Theoretical and Practical Comparison of SPME and Liquid-Liquid Extraction with Large Volume Injection for Analysis of Aqueous Samples by GC Book chapter Snow, N.	overview article	GC-FID
743	**Semivolatiles in water**	**Use of bench top photochemical reactor and SPME to measure semivolatile organic compound-hydroxyl radical rate constants Environ. Toxicol. Chem 2000, 19(7), 1705-1710 Bernhard, M., Simonich., S.**		
271	PCBs in water	Adsorption versus Absorption of Polychlorinated Biphenyls onto SPME Coatings Anal. Chem. 70 (9): 1866-1869 (1998) Yang, Y., Hawthorne, S., Miller, D., Liu, Y., Lee, M.	100µm & 7µm PDMS 5 hr stirring	GC-ECD
744	**PCBs in water**	**Response to comments on adsorption versus absorption of polychlorinated biphenyls onto SPME coatings Anal. Chem. 72 (3): 642-6643 (2000) Yang, Y., Hawthorne, S., Miller, D., Liu, Y., Lee, M.**		
745	**Review article**	**Evolution of solid phase microextracton technology J. Chromatogr. A 885(2000) 153-193 Lord, H., Pawliszyn, J.**	**various**	
557	Benzene, 4-methylpentan-2one in water	Theory of analyte extraction by selected porous polymer SPME fibers Analyst (Cambridge, UK) (1999), 124(5), 643-649 Gorecki, T., Yu, Z., Pawliszyn, J.	PDMS/DVB, CW/DVB	

	Analyte / Matrix	Literature Reference	SPME Fiber / Extraction Conditions	Instrument
558	Organics in solvents	New SPME fibers, Not only for aqueous systems LaborPraxis (1999), 23(3), 30-32, 34 Haag, Ingo	PDMS/Carboxen/DVB Nafion	
573	BTEX in Methanol	New coating surfaces of fibers for SPME J-Microcolumn-Sep. May 1999; 11(5): 377-383 Ligor,-M; Scibiorek,-M; Buszewski,-B	evaluation of various coatings	
589	Coffee sample	SPME application in GC/olfactometry dilution analysis J-Agric-Food-Chem. Apr 1999; 47(4): 1616-1618 Deibler,-KD; Acree,-TE; Lavin,-EH	PDMS fibers 15 min headspace	GC-FID
355	Terbutryn in water	SPME with Rotation of the Microfiber Anal. Chem 1998, 70, 3981-3982 Geppert, H.	30µm PDMS immersion stirring	GC-FID
409	Organics in water	Partitioning of Organic Chemicals to Polyacrylate-Coated SPME Fibers: Kinetic Behavior and Quantitative Structure Property Relationship Anal. Chem. 68: 4458-4462 (1996) Vaes, W., Harnwijk, C., Urreatarazu, R., Verhaar, H.	85µm polyacrylate 35 min immersion stirring pH 7.5	GC-FID, -ECD, MS
408	Methylmercury iodide in soil and water	Application of Isotope Dilution to Ion Trap GC-MS Anal. Chem 71, No. 2, Jan. 15, 1999, pg. 483-488 Barshick, C., Barshick, E., Walsch, E., Vance, M., Britt, P.	65µm PDMS/DVB 5 min immersion stirring	GC-MS

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  Fax 800-447-3044 or 814-359-3044

SPME Publications

Literature No.	Title	Pages
Biochemical / Food and Beverage		
T195869	Solid Phase Microextraction: Solventless Sample Preparation for Monitoring Flavor Compounds by Capillary Gas Chromatography (AYM)	4
T196901	Solid Phase Microextraction/Capillary GC Analysis of Drugs, Alcohols, and Organic Solvents in Biological Fluids (AYY)	8
T396110	SPME Reduces Extraction Time in HPLC Analyses of Food Antioxidants and Preservatives	2
T397140	Analysis of Fat Soluble Vitamins from Tablets, Using SPME/HPLC (BKK)	2
T398147	Solid Phase Microextraction of Odors in Drinking Water, for Analysis by GC/MS (BRG)	2
Pharmaceutical		
T394062	Monitor Organic Volatile Impurities (OVIs) in Pharmaceutical Products, Using Solid Phase Microextraction/Capillary GC (AQX)	2
Forensic		
T196901	Solid Phase Microextraction/Capillary GC Analysis of Drugs, Alcohols, and Organic Solvents in Biological Fluids (AYY)	8
T198922	SPME/GC for Forensic Applications: Explosives, Fire Debris, and Drugs of Abuse (BQS)	8
T394061	Solid Phase Microextraction/Capillary GC: Rapid, Sensitive Detection of Gasoline in Fire Debris (AQW)	2
T396098	SPME / HPLC Interface Combines Fast Sample Extraction with Efficient Analysis for Explosives (ASE)	2
Environmental		
T394006	Solid Phase Microextraction of Semivolatile Compounds in US EPA Method 625 (AOH)	2
T394011	Solid Phase Microextraction of Volatile Compounds in US EPA Method 524.4 (AOM)	2
T394017	Polyacrylate Film Fiber for Solid Phase Microextraction of Polar Semivolatiles from Water (AOS)	2
T394056	Fast Analysis of Volatile Organic Compounds by Solid Phase Microextraction/Capillary GC (AQL)	2
T394058	Fast Screening for Chlorinated Pesticides by Solid Phase Microextraction/Capillary GC (AQN)	2
T395081	Monitor BTEX Compounds and Fuels in Water, Using Solid Phase Microextraction and Capillary GC (ARO)	2
T395085	Solid Phase Microextraction/Capillary GC Analysis of Nitrogen-Containing Herbicides in Water (ARS)	2
T396094	Solid Phase Microextraction of Organophosphate Insecticides and Analysis by Capillary GC/MS (ASB)	2
T396099	SPME / HPLC: A Rapid and Sensitive Analysis of Polynuclear Aromatic Hydrocarbons in Water (ASF)	2
T396106	Analysis of Surfactants in Water by SPME/HPLC	2
T397121	Solid Phase Microextraction for HPLC Analysis of Carbamate and Urea Pesticides (BGU)	2
T397141	Air Sampling of VOCs Using SPME for Analysis by Capillary GC (BKF)	2
T397143	Field Sampling for Pesticides, Using Solid Phase Microextraction/Capillary GC (BJT)	2
T398147	Solid Phase Microextraction of Odors in Drinking Water, for Analysis by GC/MS (BRG)	2
Lab Hints and Selection Guides		
T198923	Solid Phase Microextraction: Theory and Optimization of Conditions	8
T396098	SPME / HPLC Interface Combines Fast Sample Extraction with Efficient Analysis for Explosives (ASE)	2
T413019	Solid Phase Microextraction – Fiber Assemblies and Accessories (AIM)	2
T496037	Solid Phase Microextraction Sampling Stand (AWS)	2
T496049	SPME / HPLC Interface (AWV)	2
T497105	SPME Portable Field Sampler with Carboxen/PDMS Fiber (BIZ)	2
T497174	SPME Portable Field Sampler waith 100µm PDMS Fiber (BKL)	2

Ordering Information:

SPME Fiber Assemblies (pk. of 3)

Film Thickness	Description	Hub Description	Recommended Use	Manual Std. Needle	Manual 23 Ga.* Needle	Automated/HPLC Std. Needle	Automated/HPLC 23 Ga.* Needle
Polydimethylsiloxane (PDMS) – considered nonpolar for nonpolar analytes							
100µm	nonbonded	red/plain	GC/HPLC	**57300-U**	**57342-U**	**57301**	**57341-U**
30µm	nonbonded	yellow/plain	GC/HPLC	**57308**	–	**57309**	–
7µm	bonded	green/plain	GC/HPLC	**57302**	–	**57303**	–
Polydimethylsiloxne/Divinylbenzene (PDMS/DVB) – ideal for many polar analytes, especially amines							
65µm	partially crosslinked	blue/plain	GC	**57310-U**	**57346-U**	**57311**	**57345-U**
60µm	partially crosslinked	brown/notched	HPLC	–	–	**57317**	–
65µm StableFlex**	highly crosslinked	pink/plain	GC	**57326-U**	–	**57327-U**	–
Polyacrylate – highly polar coating for general use, ideal for phenols							
85µm	partially crosslinked	white/plain	GC/HPLC	**57304**	–	**57305**	–
Carboxen/Polydimethylsiloxane (CAR/PDMS) – ideal for gaseous/volatile analytes, high retention for trace analysis							
75µm	partially crosslinked	black/plain	GC	**57318**	**57344-U**	**57319**	**57343-U**
85µm StableFlex**	highly crosslinked	light blue/plain	GC	**57334-U**	–	**57335-U**	–
Carbowax/Divinylbenzene (CW/DVB) – for polar analytes, especially for alcohols, low temperature limit							
65µm	partially crosslinked	orange/plain	GC	**57312**	–	**57313**	–
70µm StableFlex**	highly crosslinked	yellow-green/plain	GC	**57336-U**	**57338-U**	**57337-U**	**57339-U**
Carbowax/Templated Resin (CW/TPR) – developed for HPLC applications, e.g. surfactants							
50µm	partially crosslinked	purple/notched	HPLC	–	–	**57315**	–
Divinylbenzene/Carboxen/PDMS (DVB/CAR/PDMS) – ideal for broad range of analyte polarities, good for C3-C20 range							
50/30µm StableFlex**	highly crosslinked	gray/plain	GC	**57328-U**	–	**57329-U**	–
50/30µm StableFlex**	highly crosslinked	gray/notched	GC	**57348-U**	–	–	–

*Ga. – Needle gauge. Standard needle is 24 gauge.
**Stableflex fiber is more flexible than original fibers. It is designed to minimize fiber breakage.

Fiber Kits (pk. of 3)

Name	Description of Fiber Coatings	Recommended Use	Manual	Automated/HPLC
Kit #1	85µm polyacrylate, 100µm PDMS, 7µm PDMS	GC	**57306**	**57307**
Kit #2	75µm Carboxen/PDMS, 65µm PDMS/DVB, 65µm Carbowax/DVB	GC	**57320-U**	**57321-U**
Kit #3	60µm PDMS/DVB, 50µm Carbowax/templated resin, 100µm PDMS	HPLC	–	**57323-U**
Kit #4	100µm PDMS, 65µm PDMS/DVB, 75µm Carboxen/PDMS	GC	**57324-U**	**57325-U**

SPME Fiber Holders

Manual version	**57330-U**
Automated version	
For Varian Autosystem or HPLC	**57331**
For GERSTEL/Leap/CTC Combi-Pal	**57347-U**

Portable Field Samplers (pk. of 2)

75µm PDMS/Carboxen fiber	**504831**
100µm PDMS fiber	**504823**
70µm Carbowax/DVB fiber	**57340-U**
65µm PDMS/DVB StableFlex Fiber	**57359-U**

SPME Sampling Stands

For 4mL vials (8 slots)	**57333-U**
For 15mL vials (6 slots)	**57357-U**
Vial Puck for 15mL vials	**57358-U**
Vial Holder for 40mL vials	**33313-U**

SPME Inlet Guide

Supports manual holder during injection.	**57356-U**

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