

## PEER-REVIEWED JOURNAL PUBLICATIONS

1. Parker, D.B, M.B. Rhoades, G.L. Schuster, J.A. Koziel, Z. Perschbacher. Odor characterization at open-lot cattle feedyards using forced-choice olfactometry. *The Transactions of ASAE*, submitted.
2. Koziel, J.A., P. Martos, and J. Pawliszyn. 2004. System for generation of standard gas mixtures of volatile and semivolatile organic compounds for calibrations of solid phase microextraction and other sampling devices. *Journal of Chromatography A*, 1025, 3-9.
3. Xiong, G., J.A. Koziel, J. Pawliszyn. 2004. Air sampling of aromatic hydrocarbons in the presence of ozone with solid phase microextraction. *Journal of Chromatography A*, 1025, 57-62.
4. Spinhirne, J.P., J.A. Koziel, and N. Chirase. 2004. Sampling and analysis of VOCs in bovine breath using solid-phase microextraction and gas chromatography-mass spectrometry. *Journal of Chromatography A*. 1025, 63-69.
5. Chen, Y., J.A. Koziel, and J. Pawliszyn. 2003. Calibration for rapid on-site analysis of organic compounds and aqueous and gaseous samples using solid phase microextraction. *Analytical Chemistry*. 75(22), 6485-6493.
6. Spinhirne, J.P., J.A. Koziel. 2003. Generation and Calibration of Standard Gas Mixtures for Volatile Fatty Acids using Permeation Tubes and Solid Phase Microextraction. *Transactions of ASAE*, 46(6):1639-1646.
7. Spinhirne, J.P., J.A. Koziel, and N. Chirase. 2003. Characterizing volatile fatty acids and other gases in a closed *in vitro* fermentation system using solid phase microextraction and gas chromatography-mass spectrometry. *Transactions of ASAE*. 46(2):585-588.
8. Spinhirne, J.P., J.A. Koziel and N. Chirase. 2003. A device for noninvasive on-site sampling of cattle breath with solid phase microextraction. *Biosystems Engineering*. 84(2):239-246.
9. Koziel, J.A., J. Pawliszyn, E. Legec, E. Mrowczynska, E. Podsiadlo, J. Biernat, and M. Jarosz. 2001. Application of Solid Phase Microextraction to Air Analysis. Methodology and Measurements in Occupational Air Environments. *Chemia i Inzynieria Ekologiczna*. 8(2-3): 159-175.
10. Koziel, J.A., J. Noah, and J. Pawliszyn. 2001. Field sampling and determination of formaldehyde in indoor air with solid phase microextraction and on-fiber derivatization. *Environmental Science & Technology*. 35:1481-1486.
11. Odziemkowski, M., J.A. Koziel, D. Irish, and J. Pawliszyn. 2001. Sampling and Raman confocal microspectroscopy analysis of airborne particulate matter using polydimethylsiloxane solid phase microextraction fibers. *Analytical Chemistry*. 73:3131-3139.
12. Koziel, J.A., R.L. Corsi, and D.F. Lawler. 2001. Gas-Liquid Mass Transfer Along Small Sewer Reaches. *Journal of Environmental Engineering*. 127(5):430-437.
13. Koziel, J.A., M. Odziemkowski, and J. Pawliszyn. 2001. Sampling and analysis of airborne particulate matter and aerosols using in-needle trap and SPME fiber devices. *Analytical Chemistry*. 73:47-53.
14. Sukola, K., J.A. Koziel, F. Augusto, and J. Pawliszyn. 2001. Diffusion-Based Calibration for Fast SPME Analysis of Aqueous Samples. *Analytical Chemistry*. 73:13-18.

15. Koziel, J.A. and J. Pawliszyn. 2001. Air sampling and analysis of VOCs with solid phase microextraction. *Journal of the Air & Waste Management Association*. 51:173-184.
16. Augusto, F., J.A. Koziel, and J. Pawliszyn. 2001. Design and Validation of Portable SPME Devices for Rapid Field Air Sampling and Diffusion Based Calibration. *Analytical Chemistry*. 73:481-486.
17. Koziel, J.A., M. Jia, and J. Pawliszyn. 2000. Air sampling with porous solid-phase microextraction fibers. *Analytical Chemistry*. 72(21):5178-5186.
18. Jia, M., J.A. Koziel, and J. Pawliszyn. 2000. Fast field sampling/sample preparation and quantification of volatile organic compounds in indoor air by solid phase microextraction and portable GC. *Field Analytical Chemistry and Technology*. 4:73-84.
19. Semenov, S., J.A. Koziel, and J. Pawliszyn. 2000. Kinetics of solid phase extraction in thin adsorbent layer with saturation sorption isotherm. *Journal of Chromatography A*. 873(1):39-51.
20. Koziel, J.A., B. Shurmer, and J. Pawliszyn. 2000. Fiber Conditioner for Solid Phase Microextraction: Design, Testing and Applications. *Journal of High Resolution Chromatography*. 23(4):343-347.
21. Koziel, J.A., M. Jia, A. Khaled, J. Noah, and J. Pawliszyn. 1999. Field air analysis with SPME device. *Anal. Chim. Acta*. 400(1-3):153-162.

#### INVITED/EDITOR-REVISED JOURNAL PUBLICATIONS

1. Koziel, J.A. and J.P. Spinhirne. December 2002/January 2003. Sampling Odorous Gases Is Easier, Less Expensive with Solid Phase Microextraction. *Water Environment Laboratory Solutions*. 9(6):1-4.
2. Koziel, J.A., I. Novak. 2002. Sampling and sample preparation strategies based on solid phase microextraction for analysis of indoor air. *Trends in Analytical Chemistry*. 21(12):840-850.
3. Koziel, J.A., R.L. Corsi, and D. Lawler. 2002. Closure to Gas-Liquid Mass Transfer Along Small Sewer Reaches. *Journal of Environmental Engineering*. 12:1190-1192.
4. Koziel, J.A., M. Jia, A. Khaled, J. Noah, and J. Pawliszyn. 2001. Field air sampling with SPME," *Journal of Automated Methods & Management in Chemistry*. 23(1):54.

#### BOOK CHAPTERS

1. Koziel, J.A. 2002. Sampling and sample preparation for indoor air analysis, in J. Pawliszyn (Editor) Sampling and Sample Preparation Techniques for Field and Laboratory. Elsevier, Amsterdam, The Netherlands, pp 1-32.
2. Koziel, J.A. 2003. Nitrogen Measurement. Encyclopedia of Water Science. Marcel Dekker, New York, NY, pp 625-629.

#### INVITED PRESENTATIONS

1. J.A. Koziel, "Evaluation of sample recoveries of malodorous gases for odor bags, SPME and sorbent tubes", Research Triangle Institute, RTP, NC, October 19, 2004.
2. J.A. Koziel, "Emissions of odorous VOCs and semi-VOCs from livestock operations", presented at the *USDA Agricultural Air Quality Task Force* meeting in Phoenix, AZ, June, 2004.

3. J.A. Koziel, "Municipal Sewers as Sources of Hazardous Air Pollutants", *U.S. EPA Environmental Research Seminar, STAR Program*, Dallas, May 2003.
4. J.A. Koziel, B-H. Baek, A. Balota, J. Sweeten, "Continuous air sampling and analysis of NH<sub>3</sub>, H<sub>2</sub>S, CO<sub>2</sub>, and dust (PM-10) in swine finish barns". *ExTech '2003 International Symposium on Advances in Extraction Technologies*, Tampa, FL, 2003.
5. Fang, F., J.A. Koziel, and J. Pawliszyn. 2003. Needle trap device in field analysis. *ExTech '2003 International Symposium on Advances in Extraction Technologies*, Tampa, FL, 2003.
6. J.P. Spinhirne, J.A. Koziel, N. Chirase, "Sampling and analysis of bovine breath with SPME and GC-MS". *ExTech '2003 International Symposium on Advances in Extraction Technologies*, Tampa, FL, 2003.
7. J.A. Koziel, "Odor and Odorous Gases: Concerns and Control Measures," *Annual Great Plains Symposium*, Amarillo, TX, 2002.
8. J.A. Koziel, J.P. Spinhirne, D.B. Parker, D. Williams, "Diffusion-based air sampling with solid phase microextraction for indoor and ambient air". *Pittcon 2002 Conference and Exhibition in Analytical Chemistry and Applied Spectroscopy (Sample Advances in Passive/Diffusive Sampling for Indoor and Outdoor Air Quality Monitoring)* Symposium), New Orleans, 2002.
9. J.A. Koziel, F. Augusto, M. Jia, A. Khaled, J. Noah, C. Zini, J. Pawliszyn, "Field Air Sampling with SPME", *Pittcon 2001 Conference and Exhibition in Analytical Chemistry and Applied Spectroscopy (Sample Preparation Symposium)*, New Orleans, March, 2001.
10. J.A. Koziel, "Air Sampling with Solid Phase Microextraction," Centers for Disease Control and Prevention, Atlanta, GA, 2000.
11. J.A. Koziel, "Air Analysis by SPME," U.S. EPA, National Risk Management Research Laboratory, Indoor Environment Management Branch, Research Triangle Park, NC, 1999.

#### CONFERENCE PAPERS AND PROCEEDINGS

1. J.A. Koziel, J.P. Spinhirne, D. Wright, L. Nielsen, D. Eaton, D.B. Parker. 2004. Evaluation of sample recoveries of malodorous gases for odor bags, SPME and sorbent tubes. Paper # 044129 in the proceedings of the *2004 ASAE/CSAE Annual International Meeting*, August, 2004, Ottawa, Ontario, Canada.
2. D. Wright, L. Nielsen, D. Eaton, F. Kuhrt, J.A. Koziel, J.P. Spinhirne, D.B. Parker. 2004. Multidimensional GC-MS-olfactometry for identification and prioritization of malodors from confined animal feeding operations. Paper #044128 in the proceedings of the *2004 ASAE/CSAE Annual International Meeting*, August, 2004, Ottawa, Ontario, Canada.
3. D.B. Parker, S. Pandrangi, L.W. Greene, L. Almas, N.A. Cole, M. Rhoades, and J.A. Koziel. Application Rate and Timing Effects on Urease Inhibitor Performance for Minimizing Ammonia Emissions From Beef Cattle Feedyards, Paper #4080 in the proceedings of the *2004 ASAE/CSAE Annual International Meeting*, August, 2004, Ottawa, Ontario, Canada.
4. J.A. Koziel, B.H. Baek, J.P. Spinhirne, D.B. Parker. 2004. Ambient ammonia and hydrogen sulfide concentrations at cattle feedlot in Texas. Paper #044112 in the proceedings of the *2004 ASAE/CSAE Annual International Meeting*, August, 2004, Ottawa, Ontario, Canada.

5. A.J. Heber, J.-Q. Ni, T.-T. Lim, D.B. Beasley, S.J. Hoff, L.D. Jacobson, J.A. Koziel, and Y. Zhang. 2004. Proposed Standard for Measuring Airborne Pollutant Emissions from Livestock Housing. Paper #044181 in the proceedings of the *2004 ASAE/CSAE Annual International Meeting*, August, 2004, Ottawa, Ontario, Canada.
6. L.D. Jacobson, B.P. Hetchler, R.I. Nicolai, V.J. Johnson, D.R. Schmidt, P.R. Goodrich, S.J. Hoff, A.J. Heber, Y. Zhang, J. McClure, M. Roberts, J.A. Koziel, B.H. Baek, A. Balota, J.P. Spinhirne, J.M. Sweeten, D.B. Beasley, G.R. Baughman, R. Munilla. 2004. Preliminary NH<sub>3</sub>, H<sub>2</sub>S, CO<sub>2</sub>, PM<sub>10</sub>, and Odor Data from Pig and Poultry Buildings from Six State Project. Paper #044156 in the proceedings of the *2004 ASAE/CSAE Annual International Meeting*, August, 2004, Ottawa, Ontario, Canada.
7. S.J. Hoff, D.S. Bundy, M.S. Huebner, B.C. Zelle, L.D. Jacobson, B.P. Hetchler, V.J. Johnson, D.R. Schmidt, P.R. Goodrich, A.J. Heber, J.Q. Ni, T.T. Lim, P.C. Tao, Y. Zhang, J. McClure, S. Jerez, M. Roberts, J.A. Koziel, B.H. Baek, A. Balota, J.P. Spinhirne, J.M. Sweeten, D.B. Beasley, G.R. Baughman, R. Munilla. 2004. Real-Time Ventilation Rate Measurements from Mechanically Ventilated Livestock and Poultry Buildings for Emission Rate Estimations. Paper #044178 in the proceedings of the *2004 ASAE/CSAE Annual International Meeting*, August, 2004, Ottawa, Ontario, Canada.
1. J.A. Koziel, B.H. Baek, J.P. Spinhirne, D.B. Parker, N.A. Cole. 2004. Emissions of ammonia and hydrogen sulfide from beef cattle pens in Texas. In the proceedings of the *AgEng 2004, "Engineering the Future"* conference in Leuven, Belgium, September, 2004.
2. J.A. Koziel, B.H. Baek, K.J. Bush, J.P. Spinhirne, J.M. Sweeten. 2004. Emissions of particulate matter from swine finish barns in Texas. In the proceedings of the *AgEng 2004, "Engineering the Future"* conference in Leuven, Belgium, September, 2004.
3. S. J. Hoff, D. S. Bundy, L. D. Jacobson, A. J. Heber, J. Koziel, D. Beasley and Y. Zhang. 2004. Emissions of Ammonia, Hydrogen Sulfide, and Odor During and After Slurry Removal from a Deep-Pit Swine Finisher. In the proceedings of the *AgEng 2004, "Engineering the Future"* conference in Leuven, Belgium, September, 2004.
4. B-H. Baek, J.A. Koziel, J. Spinhirne, D. Parker, and N.A. Cole. 2004. Measurements of ammonia and hydrogen sulfide fluxes from cattle pens in Texas. Paper #04-A-644 in the proceedings of the *2004 AWMA Annual Meeting and Exhibition*, Indianapolis, IN, June 2004.
5. J. Spinhirne, J.A. Koziel, B-H. Baek, and D. Parker. 2004. Determination of volatile fatty acid fluxes from cattle pens. Paper # 04-A-646 in the proceedings of the *2004 AWMA Annual Meeting and Exhibition*, Indianapolis, IN, June 2004.
6. J.A. Koziel, D.B. Parker, B-H. Baek, J. Spinhirne, and J. Sweeten. 2004. Measurement of odor emissions form swine finish barns in Texas. Paper # 04-A-645 in the proceedings of the *2004 AWMA Annual Meeting and Exhibition*, Indianapolis, IN, June 2004.
7. S. Jerez, Y. Zhang, J. McClure, L. Jacobson, A. Heber, S. Hoff, J.A. Koziel, and D. Beasley. 2004. Comparison of total particulate emissions using tapered element oscillating microbalance and TSP sampler. Paper # 04-A-636 in the proceedings of the *2004 AWMA Annual Meeting and Exhibition*, Indianapolis, IN, June 2004.

8. J.A. Koziel, B-H. Baek, J.P. Spinhirne and A. Balota “On-site continuous measurement of ammonia and hydrogen sulfide in air at livestock operations with chemiluminescence- and pulsed fluorescence-based analyzers.” In the proceedings of the *Pittcon 2004 Conf. and Exhibition in Analytical Chemistry and Applied Spectroscopy*, Chicago, March, 2004.
9. J.A. Koziel, J.P. Spinhirne, B-H. Baek, and D.B. Parker, “Air sampling and analysis of volatile fatty acids using sorbent tubes and ATD-GC-MS.” In the proceedings of the *Pittcon 2004 Conf. and Exhibit. in Analytical Chemistry and Applied Spectr.*, Chicago, March, 2004.
10. J.P. Spinhirne, J.A. Koziel and, J.D. Lloyd. “Deterioration of DVB/Carboxen/PDMS SPME fiber coating under repetitive extraction/thermal desorption in a GC injector.” In the proceedings of the *Pittcon 2004 Conf. and Exhibit. in Analytical Chemistry and Applied Spectr.*, March, 2004.
11. R. E. Sheffield, D.B. Parker, J.A. Koziel, R. Dye, M. Thompson, “Evaluation of Field-Based Odor Assessment Methods”, submitted for the *WEF/AWMA Odor Specialty Conference, Odors and Toxic Air Emissions*, Bellevue, WA, April, 2004.
12. D. B. Parker, M. B. Rhoades, B.W. Auvermann, J.A. Koziel, “Odor Characterization at Open-Lot Beef Cattle Feedyards Using Triangular Forced Choice Olfactometry”. Paper #034105 in the proceedings for the *2003 ASAE Annual International Meeting*, Las Vegas, July 2003.
13. J. D. Buchanan, D. B. Parker, M. B. Rhoades, J.A. Koziel, and W. J. Rogers. Assessment of Moisture Control and Additives for Odor Reduction from Open-Lot Feedyard Surfaces. Paper #034140 in the proceedings for the *2003 ASAE Annual Intl Meeting*, Las Vegas, July 2003.
14. D. B. Parker, M. B. Rhoades, J.A. Koziel, and J. P. Spinhirne. Background Odors in Tedlar® Bags Used for CAFO Odor Sampling. Paper #034144 in the proceedings for the *2003 ASAE Annual International Meeting*, Las Vegas, July 2003.
15. Spinhirne, J., J.A. Koziel, and N. Chirase. Characterization of Volatile Organic Compounds in Bovine Breath Using Solid-Phase Microextraction and Gas Chromatography-Mass Spectrometry. Paper # 034031 in the proceedings of the *2003 ASAE Annual International Meeting*, Las Vegas, July 2003.
16. Baek, Koziel, Spinhirne, Parker, Cole, “Estimation of Ammonia and Hydrogen Sulfide Emission Fluxes and Rates from Cattle Feedlots in Texas”, Paper # 034111 in the proceedings the *2003 ASAE Annual International Meeting*, Las Vegas, July 2003.
17. Heber, Ni, Jacobson, Lim, Nicolai, Koziel, Hoff, Zhang, Beasley, “Quality Assured Measurements of Livestock Building Emissions. Part 1: Gas Concentrations”, in the Proceedings of the *Air & Waste Management Association’s Symposium on Air Quality Measurement Methods*, San Francisco, November, 2002.
18. Heber, Lim, Gallien, Ni, Zhang, Jacobson, Koziel, Hoff, Baughman, “Quality Assured Measurements of Livestock Building Emissions. Part 2: Particulate Matter Concentrations”, in the Proceedings of the *Air & Waste Management Association’s Symposium on Air Quality Measurement Methods*, San Francisco, November, 2002.
19. Jacobson, Nicolai, Heber, Ni, Lim, Koziel, Hoff, Zhang, Beasley, “Quality Assured Measurements of Livestock Building Emissions. Part 3: Odor Concentrations”, in the Proceedings of the *Air & Waste Management Association’s Symposium on Air Quality Measurement Methods*, San Francisco, November, 2002.

20. Koziel, Spinhirne, "Sampling and characterization of VOCs with solid phase microextraction" in the Proceedings of the *Air & Waste Management Association's Symposium on Air Quality Measurement Methods*, San Francisco, November, 2002.
21. Baek, Koziel, Spinhirne, Parker, and Cole, "Estimation of Ammonia and Hydrogen Sulfide Fluxes from Cattle Feedyard Surfaces in Texas High Plains". In the proceedings of the *ASAE 2003 Third Intl Conf. on Air Pollution from Agricultural Operations*, Raleigh, NC, 2003.
22. Koziel, J.A. and J. Spinhirne, "Generation and Calibration of Standard Gas Mixtures for Volatile Fatty Acids using Permeation Tubes and Solid Phase Microextraction". In the proceedings of the *ASAE 2003 Third International Conference on Air Pollution from Agricultural Operations*, Raleigh, NC, October, 2003.
23. Baek, B-H., J.A. Koziel, and D.B. Parker. "Comparison of Ammonia and Hydrogen Sulfide Mass Emission Rates from Artificial Cattle Feedlot Surfaces Using Two Designs of Isolation Flux Chambers." In the Proceedings of the *CIGR International Symposium on Gaseous and Odour Emissions from Animal Production Facilities*, Horsens, Denmark, June, 2003.
24. Koziel, Spinhirne, Chirase, "Sampling and analysis of gaseous emissions with solid phase microextraction" In the Proceedings of the *CIGR International Symposium on Gaseous and Odour Emissions from Animal Production Facilities*, Horsens, Denmark, June, 2003.
25. Jacobson, Heber, Zhang, Koziel, Sweeten, Bundy, Hoff, Beasley, Baughman "Air Pollutant Emissions from Confined Animal Buildings in the United States," accepted for the presentation at the *CIGR International Symposium on Gaseous and Odour Emissions from Animal Production Facilities*, Horsens, Denmark, June, 2003.
26. Koziel, Baek, Balota, Sweeten, "Continuous air sampling and analysis of NH<sub>3</sub>, H<sub>2</sub>S, CO<sub>2</sub>, and dust (PM-10) in swine finish barns". Invited presentation in the proceedings of the *ExTech '2003 International Symposium on Advances in Extraction Technologies*, Tampa, March, 2003.
27. Fang, F., J.A. Koziel, and J. Pawliszyn. 2003. Needle trap device in field analysis. Invited presentation in the proceedings of the *ExTech '2003 International Symposium on Advances in Extraction Technologies*, Tampa, March, 2003.
28. Spinhirne, Koziel, Chirase, "Sampling and analysis of bovine breath with SPME and GC-MS". Invited poster presentation in proceedings of the *ExTech '2003 International Symposium on Advances in Extraction Technologies*, Tampa, March, 2003.
29. Koziel, Spinhirne, Chirase, "Noninvasive Sampling and Analysis of Bovine Breath Using SPME and GC-MS". Poster in the proceedings of the *Pittcon 2003 Conference and Exhibition in Analytical Chemistry and Applied Spectroscopy*, Orlando, March, 2003.
30. Spinhirne, Koziel, "Generation and Calibration of Standard Gas Mixtures for Volatile Fatty Acids using Permeation Tubes and Solid Phase Microextraction". In the proceedings of the *Pittcon 2003 Conference and Exhibition in Analytical Chemistry and Applied Spectroscopy*, Orlando, March, 2003.
31. Stein J. Koziel J., Rush C. The use of SPME/GC for the detection of trimethylamine production in the bunt fungi *Tilletia Tritici* and *T. Indica*. Abstract in the proceedings of the APS Southern Division Conference.

32. Spinhirne, Koziel, Chirase, "Characterizing Volatile Fatty Acids and Other Gases in a Rumen Closed In Vitro Fermentation System," in the proceedings of the *American Dairy Science Association – Amer. Soc. of Animal Scientists Joint Annual Meeting*, Quebec, Canada, 2002.
33. Koziel, Spinhirne, Parker, Williams, "Diffusion-based air sampling with solid phase microextraction for indoor and ambient air", in the proceedings of the *Pittcon 2002 Conference and Exhibition in Analytical Chemistry and Applied Spectroscopy* (invited Sample Advances in Passive/Diffusive Sampling for Indoor and Outdoor Air Quality Monitoring" Symposium), New Orleans, March, 2002.
34. Koziel, Spinhirne, Chirase, "Noninvasive sampling and analysis of bovine breath using solid-phase microextraction and gas chromatography-mass spectrometry: a feasibility study," in the proceedings of the *2002 ASAE/CIGR Annual International Meeting*, Chicago, IL, July, 2002.
35. Spinhirne, Koziel, Parker, Williams, Cole, Sweeten, "Screening for volatile organic fatty acids in agricultural air using solid-phase microextraction and GC-MS," in the proceedings of the *2002 ASAE/CIGR Annual Intl Meeting*, Chicago, IL, 2002.
36. Koziel, "Odor and Odorous Gases: Concerns and Control Measures," in the proceedings of the *Annual Great Plains Symposium*, Amarillo, TX, April 2002.
37. Koziel, Spinhirne, "Sampling And Characterization Of Airborne Contaminants And Odorous Compounds Using Solid Phase Microextraction," in proceedings of the *Odors and Toxic Air Emissions 2002 Water Environment Federation Conf.*, Albuquerque, NM, April/May, 2002.
38. Sweeten, Jacobson, Heber, Schmidt, Lorimor, Westerman, Miner, Zhang, Williams, Auvermann, Koziel, "Odor Mitigation for Concentrated Animal Feeding Operations: White Paper and Recommendations," in the Proceedings of the *International Symposium Addressing Animal Production and Environmental Issues*, Research Triangle Park, NC, October, 2001.
39. Auvermann, Koziel, Parker, Amosson, Greene, Chirase, Cole, Parnell, Sweeten, "Cattle Feedlot Odor and Dust Control: Approaches and Recent Results," presented as abstract at the *Annual Meeting of the American Agricultural Economists Assoc.*, Chicago, IL, August, 2001.
40. See, Parker, Auvermann, Koziel, Sweeten, "Evaluation of Fabric Swatch Types for Relative Odor Intensity at Beef Cattle Feedyards," Paper No. 01-2260 in the Proceedings of the *2001 American Society of Agricultural Engineers Annual Intl Meeting*, Sacramento, CA, 2001.
41. Sweeten, Cole, Parker, Auvermann, Lacey, Koziel, "Controlling Ammonia Emissions from Livestock Facilities: State of the Science", in the Proceedings of the 2001 Annual Meeting of the American Society of Agronomy, Charlotte, NC, October, 2001.
42. Sukola, Koziel, Pawliszyn, Augusto, "Fast SPME Quantification with Solid Adsorbent Coated Fibers: 1. Evaluation of Aqueous Samples", paper QA-154 in Proceedings of the *24<sup>th</sup> Annual Meeting of the Brazilian Chemical Society*, Sao Paulo, Brazil, May, 2001.
43. Koziel, Pawliszyn, "Air Sampling with Solid Phase Microextraction," Paper No. 01-4038 in Proceedings of the *2001 American Society of Agricultural Engineers Annual International Meeting*, Sacramento, CA. July/August 2001.

44. Koziel, Augusto, Jia, Khaled, Noah, Zini, Pawliszyn, "Field Air Sampling with SPME", in Proceedings of the *Pittcon 2001 Conference and Exhibition in Analytical Chemistry and Applied Spectroscopy (invited Sample Preparation Symposia)*, New Orleans, March, 2001.
45. Koziel, Augusto, Odziemkowski, Pawliszyn, "Field Air Analysis with Solid Phase Microextraction", in Proceedings of the Separations in Environmental Analysis Symposia at the *American Chemical Society National Meeting* in San Diego, CA, April, 2001.
46. Koziel, Augusto, Zini, Pawliszyn, "Identification and quantification of airborne contaminants and odor compounds using fast SPME", in Proceedings of the *1st International Water Association' International Conference on Odour and VOCs: Measurement, Regulation and Control Techniques*", The University of New South Wales, Sydney, Australia, March 2001.
47. Koziel, Augusto, Sukola, Rivellino, Pawliszyn, "Diffusion-Based Calibration for Fast SPME Analysis of Aqueous Samples", in Proceedings of the *Pittcon 2001 Conference and Exhibition in Analytical Chemistry and Applied Spectroscopy*, New Orleans, March 2001.
48. Koziel, Odziemkowski, Irish, Pawliszyn, "Sampling and analysis of airborne particulate matter and aerosols with syringe-based devices", in Proceedings of the *Pittcon 2001 Conference and Exhibition in Analytical Chemistry and Applied Spectroscopy*, New Orleans, March 2001.
49. Pawliszyn, Koziel, Segal, "Sampling/sample preparation strategies for on-site monitoring," in Proceedings of the *4th Intl Chemical Congress - Pacificchem 2000*, Honolulu, HA, 2000.
50. Augusto, Koziel, Pawliszyn, "Fast Field Air Sampling using Porous Polymer-based SPME Fibers", in Proceedings of the *83<sup>rd</sup> National Meeting and Exhibition, Canadian Society for Chemistry*, Calgary, Alberta, June 2000.
51. Koziel, Pawliszyn, "Field Applications of SPME", in Proceedings of the *6<sup>th</sup> International Symposium "Chemistry Forum"*, Warsaw, Poland, May 2000.
52. Koziel, Jia, Pawliszyn, "Indoor air sampling with solid phase microextraction", in Proceedings of the *Air & Waste Management Assoc., 93rd Annual Conf. and Exhibition*, SLC, UT, 2000.
53. Koziel, Pawliszyn, "Air sampling of VOCs with solid phase microextraction", in Proceedings of the *Air & Waste Management Assoc., 93rd Annual Conf. and Exhibition*, SLC, UT, 2000.
54. Koziel, Pawliszyn, "Indoor air surveys with SPME," *ExTech '2000 International Symposium on Advances in Extraction Technologies*, Waterloo, ON, 2000.
55. Koziel, Jia, Khaled, Noah, Pawliszyn, "Field air analysis with SPME", in Proceedings of the *Pittsburgh 2000 Conference & Exhibition on Analytical Chem. and Applied Spectr.*, New Orleans, LA, March 2000.
56. Jia, Koziel, Pawliszyn, "Fast sampling and analysis of volatile organic compounds in indoor air by solid phase microextraction / field portable GC", in Proceedings of the *Pittsburgh 2000*, New Orleans, LA, March 2000.
57. Pawliszyn, Koziel, Lord, Wu, "Interfaces between real samples and microseparation techniques", in Proceedings of the *Pittcon 2000*, New Orleans, LA, March 2000.

58. Augusto, Koziel, Pawliszyn, "A device for application of SPME to quantitative analysis of living flower and plant aromas", in Proceedings of the *Pittcon 2000*, New Orleans, LA, March 2000.
59. Koziel, Segal, Pawliszyn, "Field Applications of SPME and MESI", in Proceedings of the *International Symposium on Capillary Chromatography*, Gifu, Japan, 1999.
60. Koziel, Lord, Yuan, Kataoka, Yu, Pawliszyn, "New Developments in SPME", in Proceedings of the *38<sup>th</sup> Annual Eastern Analytical Symposium and Exhibition*, Somerset, NJ, 1999.
61. Pawliszyn, Koziel, Muller, Wu, Mao, "Design and Applications of SPME Devices for Field Monitoring," in Proceedings of the *21<sup>st</sup> Int. Symposium on Capillary Chromatography and Electrophoresis*, Park City, UT, 1999.
62. Koziel, Pawliszyn, "Air Sampling by Solid Phase Microextraction: Field Studies of Indoor Air", in Proceedings of the *82nd Canadian Society For Chemistry Conference & Exhibition*, Toronto, Ontario, 1999.
63. Koziel, Lord, Pawliszyn, "Where does SPME Fit?" presented at the *ExTech '99 International Symposium on Advances in Extraction Technologies*, Waterloo, ON, 1999.
64. Koziel, Jia, Khaled, Noah, Pawliszyn, "Air Sampling by Solid Phase Microextraction," presented at the *ExTech '99 International Symposium on Advances in Extraction Technologies*, Waterloo, ON, 1999.
65. Koziel, Corsi, "VOC Emissions from Municipal Sewers: Hot Spots", in Proceedings of the *Air & Waste Management Association 91st Annual Meeting and Exhibition*, San Diego, 1998.
66. Koziel, Corsi, "A Novel Approach for Estimating VOC Emissions from Municipal Sewers, Methodology, Applications and Implications," in Proceedings of the *Air & Waste Management Association 89th Annual Meeting and Exhibition*, Nashville, 1996.

#### PATENTS AND DISCLOSURES OF INVENTION

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