Frants Roager Lauritsen
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Research interest

Mass spectrometry for analysis of chemical and biological processes in real-time. Development of hand held portable mass spectrometers.

Mass spectrometrical methods for characterization of nano-materials

Education

1986Cand. Scient. (Physics), Institute of Physics, Odense University, Denmark
1990Ph.D. (Biochemistry), Institute of Biochemistry, Odense University, Denmark
2001Dr.Scient. (Mass spectrometry), University of Southern Denmark

Professional employment:

Sep. 1990 - Feb. 1991 -:- Postdoc, Institute of Biochemistry, Odense University.

Mar. 1991- May 1992 -:- Visiting scientist, Department of Chemistry, Purdue University, Indiana, USA.

Jan. 1992 - Aug.1995 -:- Assistant professor, Institute of Biochemistry, Odense University.

Sep. 1995 - Dec. 2003 -:- Associate professor, Institute of Biochemistry, Universtity of Southern Denmark.

Jan 2004 – Mar. 2009 -:- Professor, Department of Chemistry, University of Copenhagen

Mar 2009 -Feb. 2012 -:- Professor, Department of Pharmaceutics and Analytical Chemistry, University of Copenhagen.

Mar 2012 - Mar 2021 - : - Head of Department, Department of Physics, Chemistry and Pharmacy, University of Southern Denmark

Mar 2021 - - : - Professor, Department of Physics, Chemistry and Pharmacy, University of Southern Denmark
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1996 -:- Established a private consultancy company, MIMS Systems, with expertise in design and implementation of mass spectrometers for on-site monitoring of chemical and biological processes.

Committee' s

Sep. 1992-Apr. 1993-:- Natural Science Council, Odense University.

Jan. 1993 -Dec. 1994-:- Executive committee, Centre for Process Biotechnology, The Technical University of Denmark.

Jan. 2000 - Nov. 2003 -:- Executive committee, Centre for Water Quality Sensors, DHI - Institute for Water and Environment, Aarhus, Denmark

Jan. 2000 - Nov. 2003 -:- Natural Science and Engineering Council, University of Southern Denmark.

Jan. 2003 - Dec. 2003 -:- Executive committee, Institute of Biochemistry and Molecular Biology, University of Southern Denmark.

Oct. 2003 - Oct. 2006 -:- President, Danish Society for Analytical Chemistry

May 2006 – Mar. 2009 -:- Natural Science Council, University of Copenhagen

May 2014 - -:- Board member Tornbjerg Gymnasium, Odense

May 2016 - -:- Chairman of the Board Tornbjerg Gymnasium, Odense

Mar 2019 - -:- Board member Mejeribrugets Forsknings Fond

Publications

Identification and quantification of chloramines, bromamines and bromochloramine by Membrane Introduction Mass Spectrometry (MIMS)
Hu, W., Lauritsen, F. R. & Allard, S., 10. Jan 2021, In: Science of the Total Environment. 751, 8 p., 142303.

Directing a Non-Heme Iron(III)-Hydroperoxide Species on a Trifurcated Reactivity Pathway
Wegeberg, C., Lauritsen, F. R., Frandsen, C., Mørup, S., Browne, W. R. & McKenzie, C., 2018, In: Chemistry: A European Journal. 24, 20, p. 5134-5145

Interactions between nanoparticles and lung surfactant investigated by matrix-assisted laser desorption/ionization time-of-flight mass spectrometry: Interactions between nanoparticles and lung surfactants
Chhoden, T., Clausen, P. A., Larsen, S. T., Nørgaard, A. W. & Lauritsen, F. R., 2015, In: Rapid Communications in Mass Spectrometry. 29, 11, p. 1080-1086

Portable electrospray ionization mass spectrometry (ESI-MS) for analysis of contaminants in the field
Janfelt, C., Græsbøll, R. & Lauritsen, F. R., 2012, In: International Journal of Environmental Analytical Chemistry. 92, 4, p. 397–404 8 p.

Rapid screening of drug compounds in urine using a combination of microextraction by packed sorbent and rotating micropillar array electrospray ionization mass spectrometry
Nielsen, K., Lauritsen, F. R., Nissilä, T. & Ketola, R. A., 2012, In: Rapid Communications in Mass Spectrometry. 26, 3, p. 297-303

Linking Soil O_2, CO_2, and CH_4 Concentrations in a Wetland Soil: Implications for CO_2 and CH_4 Fluxes
Elberling, B., Jensen, L. A., Jørgensen, C. J., Joensen, H. P., Kühl, M., Glud, R. N. & Lauritsen, F. R., 15. Apr 2011, In: Environmental Science & Technology (Washington). 45, 8, p. 3393-3399 7 p.

Characterization of a capillary spray cell for easy analysis of extracts of biological samples
Janfelt, C. & Lauritsen, F. R., 2011, In: International Journal of Mass Spectrometry. 299, p. 178-183

Nebulization ionization and desorption ionization analysis of reactive organofunctionalized silanes in nanofilm products
Nørgaard, A. W., Janfelt, C., Benassi, M., Wolkoff, P. & Lauritsen, F. R., 2011, In: Journal of Mass Spectrometry. 46, 4, p. 402-410

Characterization of nanofilm spray products by mass spectrometry
Nørgaard, A. W., Wolkoff, P. & Lauritsen, F. R., 2010, In: Chemosphere. 80, p. 1377-1386

Fast and direct recognition of the active ingredients in tablets using hot cell membrane inlet mass spectrometry
Lauritsen, F. R. & Nielsen, K., 2010, In: International Journal of Mass Spectrometry. 295, p. 119-123

On-line monitoring of the dynamics of trihalomethane concentrations in a warm public swimming pool using an unsupervised membrane inlet mass spectrometry system with off-site real-time surveillance
Kristensen, G. H., Klausen, M. M., Hansen, V. A. & Lauritsen, F. R., 2010, In: Rapid Communications in Mass Spectrometry. 24, 1, p. 30-34

Real-time monitoring of the progerss of polymerization reactions directly on surfaces at open atmosphere by ambient mass spectrometry
Nørgaard, A. W., Vaz, B. G., Lauritsen, F. R. & Eberlin, M. N., 2010, In: Rapid Communications in Mass Spectrometry. 24 , p. 3441-3446

Soil heterogeneity effects on O_2 distribution and CH_4 emissions from wetlands: *In situ* and mesocosm studies with planar O_2 optodes and membrane inlet mass spectrometry

Jensen, L. A., Elberling, B., Glud, R. N., Kühl, M., Lauritsen, F. R. & Joensen, H. P., 2010, In: Soil Biology & Biochemistry. 42, 12, p. 2254-2265

Analysis of semivolatile pharmaceuticals and pollutants in organic micro extracts using hot cell membrane inlet mass spectrometry
Chen, H., Xia, Z., Pedersen-Bjergaard, S., Svensmark, B. & Lauritsen, F. R., 2009, In: Analytical Chemistry. 81, 10, p. 4010-4014

In situ identification of dimethyl diselenide in hepatocytes treated with methylseleninic acid by membrane inlet mass spectrometry
Gabel-Jensen, C., Bak, S. A., Lauritsen, F. R., Hansen, H. R., Badolo, L. & Gammelgaard, B., 2009, In: Journal of Analytical Atomic Spectrometry. 24, p. 949-952

Release of VOCs and particles during use of nanofilm spray products
Norgaard, A. W., Jensen, K. A., Janfelt, C., Lauritsen, F. R., Clausen, P. A. & Wolkoff, P., 2009, In: Environmental Science & Technology (Washington). 43, 20, p. 7824-7830

Characterization and optimization of membrane inlets for a miniature ion trap mass spectrometer operating at a high background pressure of humid air
Janfelt, C., Graesboll, R. & Lauritsen, F. R., 2008, In: International Journal of Mass Spectrometry. 276, p. 17-23 7 p.

Characterization of proton-bound acetate dimers in ion mobility-spectrometry
Pedersen, C. S., Lauritsen, F. R., Sysoev, A., Viitanen, A-K., Makelä, J., Adamov, A., Laakia, J., Mauriala, T. & Kotiaho, T. , 2008, In: Journal of the American Society for Mass Spectrometry. 19, p. 1361-1366 6 p.

Fast and direct screening of solid materials for their potential liberation of hydrophobic organic compounds using hot cell membrane inlet mass spectrometry
Lauritsen, F. R., Jensen, A. & Nielsen, C., 2008, In: Rapid Communications in Mass Spectrometry. 22, p. 2334-2340 7 p.

Method for quantification of chemicals in a pollution plume using a moving membrane-based sensor exemplified by mass spectrometry
Janfelt, C., Lauritsen, F. R., Toler, S. K., Bell, R. J. & Short, R. T., 15. Jul 2007, In: Analytical Chemistry. 79, 14, p. 5336-5342

Fast and direct screening of polyaromatic hydrocarbon (PAH)-contaminated sand using a miniaturized membrane inlet mass spectrometer (mini-MIMS)
Frandsen, H., Janfelt, C. & Lauritsen, F. R., 2007, In: Rapid Communications in Mass Spectrometry. 21, 10, p. 1574-1578 5 p.

Characterization of a mini membrane inlet mass spectrometer for on-site detection of contaminants in both aqueous and liquid organic samples
Janfelt, C., Frandsen, H. & Lauritsen, F. R., 2006, In: Rapid Communications in Mass Spectrometry. 20, p. 1441–1446 6 p.

On-line monitoring of CO2 production in Lactococcus lactis during physiological pH decrease using membrane inlet mass spectrometry with dynamic pH calibration
Andersen, A. Z., Lauritsen, F. R. & Olsen, L. F., 2005, In: Biotechnology and Bioengineering (Print). 92, 6, p. 740-747

Catabolism of leucine to branched-chain fatty acids in *Staphylococcus xylosus*
Beck, H. C., Hansen, A. M. & Lauritsen, F. R., May 2004, In: Journal of Applied Microbiology. 96, 5, p. 1185-1193

On-line monitoring of important organoleptic methyl-branched aldehydes during batch fermentation of starter culture Staphylococcus xylosus reveal new insight into their production in a model fermentation
de Vos Petersen, C., Beck, H. C. & Lauritsen, F. R., 5. Feb 2004, In: Biotechnology and Bioengineering (Print). 85, 3, p. 298-305 8 p.

Sustained glycolytic oscillations - No need for cyanide, FEMS
Poulsen, A. K., Lauritsen, F. R. & Olsen, L. F., 2004, In: FEMS Microbiology Letters. 236, p. 261-266

Novel pyrazine metabolites found in polymyxin biosynthesis by Paenibacillus polymyxa
Beck, H. C., Hansen, A. M. & Lauritsen, F. R., 14. Mar 2003, In: F E M S Microbiology Letters. 220, 1, p. 67-73 7 p.

Metabolite production and kinetics of branched-chain aldehyde oxidation in Staphylococcus xylosus
Beck, H. C., Hansen, A. M. & Lauritsen, F. R., 1. Jul 2002, In: Enzyme and Microbial Technology. 31, 1-2, p. 94-101

Determination of pentachlorophenol by negative ion chemical ionization with membrane introduction mass spectrometry
Blake, T. A., Zheng, X., Aggerholm, T., Lauritsen, F. R. & Cooks, R. G., 2002, In: Analyst. 11, p. 1463-66

Membrane inlet mass spectrometry
Kotiaho, T. & Lauritsen, F. R., 2002, In: Comprehensive Analytical Chemistry. XXXVII, p. 531-57

Direct detection of polyaromatic hydrocarbons, estrogenic compounds and pesticides in water using desorption chemical ionization MIMS
Aggerholm, T. & Lauritsen, F. R., 2001, In: Rapid Communications in Mass Spectrometry. 15, p. 1826-31

Melatonin activates the peroxidase-oxidase reaction and promotes oscillations
Olsen, L. F., Lunding, A., Lauritsen, F. R. & Allegra, M., 2001, In: Biochemical and Biophysical Research Communications. 284, p. 1071-76

Chloroform in a Pristine Aquifier System: Toward an Evidence of Biogenic Origin
Laturnus, F., Lauritsen, F. R. & Grøn, C., 2000, In: Water Resources Research. 36, p. 2999-3009

Determination of Steroid Hormones by Membrane Inlet Mass Spectrometry and Desorption Chemical Ionization
Lauritsen, F. R. & Rose, J., 2000, In: Analyst. 125, p. 1577-1581

Direct Detection of Large Fat-Soluble Biomolecules Using Membrane Inlet Mass Spectrometry and Desorption Chemical Ionization
Lauritsen, F. R., Mendes, M. A. & Aggerholm, T., 2000, In: Analyst. 125, p. 211-215

Occurrence and formation of chloroform at danish forest sites
Haselmann, K. F., Ketola, R. A., Laturnus, F., Lauritsen, F. R. & Grøn, C., 2000, In: Atmospheric Environment. 34, p. 187-9

Detection of dicarboxylic acids in aqueous samples using membrane inlet mass spectrometry with desorption chemical ionization
Ketola, R. A. & Lauritsen, F. R., 1999, In: Rapid Communications in Mass Spectrometry. 13, p. 749-751

A study of the Bioconversion Potential of the Fungus Bjerkandera adusta with Respect to a Production of Chlorinated Aromatic Compounds
Lauritsen, F. R. & Lunding, A., 1998, In: Enzyme and Microbial Technology. 22, p. 459-465

Classification of Cola Beverages on the Basis of Mass Spectra Measured by Membrane Inlet Mass Spectrometry
Ketola, R., Heikkonen, J., Piepponen, S., Lauritsen, F. R. & Kotiaho, T., 1998, In: Rapid Communications in Mass Spectrometry. 12, p. 1011-1017

Direct Characterization of Bioconversion Processes Using Membrane Inlet Mass Spectrometry
Lauritsen, F. R. & Lunding, A., 1998, In: Advances in Mass Spectrometry. 14, p. 575-582

Temperature Programmed Desorption for Membrane Inlet Mass Spectrometry
Ketola, R., Grøn, C. & Lauritsen, F. R., 1998, In: Rapid Communications in Mass Spectrometry. 12, p. 773-778

Quantitative Determination of Semi-volatile Organic Compounds in Solution Using Trap-and-Release Membrane Inlet Mass Spectrometry
Lauritsen, F. R. & Ketola, R., 1997, In: Analytical Chemistry. 69, p. 4917-4922

Metabolism of halogenated compounds in the white rot fungus *Bjerkandera adusta* studied by membrane inlet mass spectrometry and tandem mass spectrometry
Beck, H. C., Lauritsen, F. R., Patrick, J. S. & Cooks, R. G., 5. Jul 1996, In: Biotechnology and Bioengineering (Print). 51, 1 , p. 23-32

Advances in Membrane Inlet Mass Spectrometry
Lauritsen, F. R. & Kotiaho, T., 1996, In: Reviews Analytical Chemistry. 15, p. 237-264

Biodegradation of cis-1,2-dichloro-ethylene at low concentrations in a methane-oxidizing biofilm
Archangeli, J. P., Mejlhede, M., Arvin, E. & Lauritsen, F. R., 1996, In: Water Research. 30, p. 1885-1893

Metabolism of halogenated Compounds in the Fungus Bjerkandera adusta Studied by membrane Inlet Mass Spectrometry and Tandem mass Spectrometry
Beck, H. C., Lauritsen, F. R., Pattrick, J. S. & Cooks, R. G., 1996, In: Biotechnology and Bioengineering (Print). 51, p. 23-32

Time and Concentration Dependent Relative Peak Intensities Observed in EI-Membrane Inlet Mass Spectra
Hansen, K., Gylling, S. & Lauritsen, F. R., 1996, In: International Journal of Mass Spectrometry and Ion Processes. 152, p. 143-155

A Fully Integrated Trap-Membrane Inlet Mass Spectrometry System for the Measurement of Semivolatile Organic Compounds in Aqueous Solution
Leth, M. & Lauritsen, F. R., 1995, In: Rapid Communications in Mass Spectrometry. 9, p. 591-596

Direct Determination of Styrene and tetrachloroethylene in Olive Oil by Membrane Inlet Mass Spectrometry
Kotiaho, T., Gylling, S., Lunding, A. & Lauritsen, F. R., 1995, In: Journal of Agricultural and Food Chemistry. 43, p. 928-930

Membrane Inlet Ion Mobility Spectrometry for the On-Line Monitoring of Fermentation Processes
Kotiaho, T., Lauritsen, F. R., Degn, H. & Paakkanen, H., 1995, In: Analytica Chimica Acta. 309, p. 317-325

On-line Monitoring of Biological Reactions at Low Part Per Trillion Levels by Membrane Inlet Mass Spectrometry
Lauritsen, F. R. & Gylling, S., 1995, In: Analytical Chemistry. 67, p. 1418-1420

An On-Line Sampling System for Fermentation Monitoring Using Membrane Inlet Mass Spectrometry (MIMS). Application to Phenoxyacetic Acid Monitoring in Penicillin Fermentation
Hansen, K., Lauritsen, F. R. & Degn, H., 1994, In: Biotechnology and Bioengineering (Print). 44, p. 347-353

Direct Detection of Volatile Metabolites Produced by Microorganisms using Membrane Inlet Mass Spectrometry
Lauritsen, F. R. & Lloyd, D., 1994, In: American Chemical Society Book Series. 541, p. 91-106

Jet Separator/Membrane Introduction Mass Spectrometry for On-Line Quantitation of Volatile Organic Compounds in Aqueous Solution
Lindy, D., Bauer, S., Cooks, R. G., Lauritsen, F. R., Kotiaho, T. & Graf, T., 1993, In: Rapid Communications in Mass Spectrometry. 7, p. 935-942

Rapid and Direct Monitoring of Volatile Fermentation Products in the Fungus Bjerkandera adusta
Lauritsen, F. R. & Kotiaho, T., 1993, In: Biological mass spectrometry. 22, p. 485-489

Direct detection and identification of volatile organic compounds dissolved in organic solvents by reversed phase membrane introduction tandem mass spectrometry
Lauritsen, F. R., Kotiaho, T., Choudhury, TK. & Cooks, R. G., 1. Jun 1992, In: Analytical Chemsitry. 64, 11, p. 1205-1211

Microporous Membrane Introduction Mass Spectrometry with Solvent Chemical Ionization and Glow Discharge for the Direct Detection of Volatile Organic Compounds in Aqueous Solution
Lauritsen, F. R., Choudhury, T. K., Dejarme, L. & Cooks, R. G., 1992, In: Analytica Chimica Acta. 266, p. 1-12

identification of Dissolved Volatile Metabolites in Microbial Cultures by Membrane Inlet Mass Spectrometry
Lauritsen, F. R., Nielsen, L., Degn, H., Lloyd, D. & Bohatka, S., 1991, In: Biological mass spectrometry. 20, p. 253-258

Membrane Introduction Mass Spectrometry
Kotiaho, T., Lauritsen, F. R., Choudhury, T. K., Cooks, R. G. & Tsao, G., 1991, In: Analytical Chemistry. 63, 18, p. 875A-883A

The Parasitic Flagellates Trichomonas Vaginalis and Tritrichomonas foetus Produce Indole and Demethyl Sulphide: Direct Characterization by Membrane Inlet Mass Spectrometry
Lloyd, D., Lauritsen, F. R. & Degn, H., 1991, In: Journal of General and Applied Microbiology. 137, p. 1743-1747

A Membrane Inlet Tandem Mass Spectrometer for Continuous Monitoring of Volatile Organic Compounds
Lauritsen, F. R., Bohatka, S. & Degn, H., 1990, In: Rapid Communications in Mass Spectrometry. 4, p. 401-403

A New membrane Inlet for On-Line Monitoring of Dissolved, Volatile Organic Compounds with Mass Spectrometry
Lauritsen, F. R., 1990, In: International Journal of Mass Spectrometry and Ion Processes. 95, p. 259-268

Gas-Exchane rates in the Belousov-Zhabotinski Reaction Determined with membrane Inlet Mass Spectrometry
Lauritsen, F. R. & Degn, H., 1989, In: The Journal of Physical Chemistry. 93, p. 2781-2783

Tinplates and Tin/Chromium Interfaces Studied by Electron Spectroscopies
Lauritsen, F. R., Onsgaard, J. & Vinternes, H., 1988, In: Surface and Interface Analysis. 12, p. 198-220