

**MERLIN K. L. BICKING. Ph. D.**

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**EDUCATION:**

Bachelor of Science - Chemistry  
University of Wisconsin - River Falls, WI, 1976

Doctor of Philosophy - Organic-Analytical Chemistry  
Iowa State University - Ames, IA, 1982

**TECHNICAL INTERESTS AND EXPERIENCE:**

Technical Training and Problem-Solving  
Analytical Separations  
Experimental Design/Method Development  
Medical Device Development

**QUALIFICATION SUMMARY:**

General Experience

- More than 20 years post-graduate experience in academia, contract research, contract laboratory, and independent consulting.
- A problem-solving, organic-analytical chemist.
- Design, manufacture, and testing of implantable medical devices.
- Currently an independent contractor for the biomedical device, pharmaceutical, food, scientific instrument, manufacturing, environmental testing, and water purification device industries.
- Extensive technical writing experience in preparation and review of technical summaries, literature reviews, risk assessment summaries, project reports, manufacturing procedures, and SOPs.

Analytical Chemistry Experience

- Knowledgeable in all aspects of analytical separations, method development, and problem-solving, using techniques such as chemical derivatization, HPLC, GC, GC/MS, SFE, SFC, FTIR, NMR, and absorbance spectrophotometry.
- The application of experimental design strategies for chemical problem-solving and data analysis.
- Application experience includes environmental analysis, chemical characterization, additive analysis, product reformulation, stability testing, and product characterization.
- Developed the *Practichem*<sup>™</sup> Series of Training Seminars, which provides practical technical training for laboratory staff.
- Author of two U.S. EPA analytical methods.

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#### Medical Device Experience

- Knowledge of Design Control, GMP, and CE Mark issues for implantable devices.
- Preparation and review of regulatory documents (IDE, Risk Assessment, FMECA, Technical Dossiers).
- Manufacturing process troubleshooting and optimization.
- Process validation.

#### **PROFESSIONAL EXPERIENCE:**

*Analytical Chemistry Consulting and Training Associates, Inc. (ACCTA, Inc.),*  
Woodbury, MN

1993 to Present. CONSULTANT and PRESIDENT

Provides independent contractor services in laboratory problem-solving, in-laboratory services, document preparation, and new technology evaluations for the biomedical device, pharmaceutical, food, scientific instrument, manufacturing, environmental, and water purification device industries. Develops and presents laboratory staff training courses on a wide variety of chemistry-related topics. (Additional details at [www.accta.com](http://www.accta.com).)

**Uroplasty, Inc.**, Minneapolis, MN

1997 to 2001. TECHNICAL DIRECTOR

Provided technical support to all aspects of design, testing, and manufacturing of implantable medical devices. Reviewed and/or prepared technical summaries, test plans and reports, regulatory submissions, and manufacturing procedures. Evaluated new technologies for manufacturing improvements and product testing. Coordinated clinical complaints.

**TCT (Twin City Testing) Corporation**, St. Paul, MN

1992 to 1993. TECHNICAL DIRECTOR, Chemistry Departments

Provided technical oversight for non-routine chemistry groups involved with routine environmental analysis, high resolution mass spectrometry, industrial chemistry, and GLP programs. Provided internal consulting and problem-solving expertise, new technology evaluation, staff training, and specialty method development.

1990 to 1992. MANAGER, Organic Analytical Chemistry

Responsibilities included management of a group of 15 professional and technical staff members in the following non-routine technical areas: dioxin programs, technology development (FTIR), product chemistry, agrichemical programs, and method development.

1988 to 1990. SUPERVISOR, Method Development Section

Responsibilities included management of a group of professional staff devoted to developing new methodologies or improving existing procedures. These duties included technical management of staff, project management, evaluation and incorporation of new technologies, and technical marketing.

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**Battelle Columbus Division**, Columbus, OH.

1985 to 1988. PRINCIPAL RESEARCH SCIENTIST AND GROUP LEADER

Duties included management of nine professional and technical staff as well as operation of HPLC laboratory. Other activities included project management, preparation of proposals and reports, and review of proposals and reports prepared by group staff members.

**State University of New York-Buffalo**, Buffalo, NY.

1982 to 1985. ASSISTANT PROFESSOR OF CHEMISTRY

Duties included preparing grant proposals, directing graduate and undergraduate research, teaching graduate and undergraduate courses and various committee assignments. A research program in analytical separations was developed.

**PUBLICATIONS:**

Bicking, M.K., and Kniseley, R.N., "Size Exclusion Chromatographic Analysis of Refuse-Derived Fuel for Mycotoxins." Anal. Chem. 1980, **52**, 2164.

Bicking, M.K.L., Kniseley, R.N., and Svec, H.J., "Determination of Aflatoxins in Air Samples of Refuse-Derived Fuel by Thin Layer Chromatography with Laser Fluorescence Spectrometric Detection." Anal. Chem. 1983, **55**, 200.

Bicking, M.K.L., Kniseley, R.N., and Svec, H.J., "Coupled-Column System for Quantitating Low Levels of Aflatoxins." *J. Assoc. Off. Anal. Chem.* 1983, **66**, 905.

Bicking, M.K.L., "Thermodynamics of Retention for Small Molecules in the Polystyrene/Chloroform System." Anal. Chem. 1984, **56**, 2671.

"Lasers and Thin Layer Chromatography: Present and Future" in *Techniques and Applications of Thin-Layer Chromatography*, J. Touchstone (Ed.), Wiley, New York, 1985, Chapter 1.

Book Review: "Steric Exclusion Liquid Chromatography of Polymers." J. Am. Chem. Soc. 1985, **107**, 1091.

Book Review: "Modern Liquid Chromatography of Macromolecules." J. Am. Chem. Soc. 1985, **107**, 3001.

Book Review: "A Guide to the HPLC Literature. Vol. 1." J. Am. Chem. Soc. 1985, **107**, 4808.

Bicking, M.K.L., and Adinolfe, N.A., "Simplex Optimization of Extractive Alkylation Procedures for Organic Acids in Aqueous Samples." J. Chromatogr. Sci. 1985, **23**, 348.

Adinolfe, N.A., and Bicking, M.K.L., "Direct Determination of Adipic Acid in Urine by Extractive Alkylation." J. Chromatogr. Sci. 1985, **23**, 407.

Adams, J.R., and Bicking, M.K.L., "Thermodynamics of Retention for Small Molecules in the Polystyrene/Toluene and Polystyrene/THF Systems." Anal. Chem. 1985, **57**, 2844.

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Bicking, M.K.L., Bicking, M.L., and Longman, W.E., "Direct Fluorination of Silica for Use in Liquid Chromatography." Anal. Chem. 1986, **58**, 499.

Skow, C.A.R., and Bicking, M.K.L., "Direct Alkylation of Carboxylic Acids in Aqueous Samples." Chromatographia 1986, **21**, 157.

Bicking, M.K.L., and Serwon, S.J., "Molecular Interactions on Polystyrene Stationary Phases." J. Liq. Chromatogr. 1987, **10**, 1369.

Bicking, M.K.L., Cooke, W.M., Kawahara, F.K., and Longbottom, J.E., "Method Development for the Determination of Formaldehyde in Samples of Environmental Origin." Am. Soc. Testing Mat., Special Technical Publication 976, 1988, pg 159.

Bicking, M.K.L., Cooke, W.M., Kawahara, F.K., and Longbottom, J.E., "The Effect of pH on the Reaction of 2,4-Dinitrophenylhydrazine with Formaldehyde and Acetaldehyde." J. Chromatogr. 1988, **455**, 310.

DeRoos, F.L and Bicking, M. K. L., "Supercritical Fluid Extraction for the Determination of PCDDs and PCDFs in Soil", Chemosphere 1990, **20**, 1355.

Bicking, M.K.L. and Wilson, R.L., "High Performance Size Exclusion Chromatography in Environmental Method Development. 1. The Effect of Mobile Phase and Temperature on the Retention of Dioxins, Furans, and Polychlorinated Biphenyls." Chemosphere 1991, **22**, 421.

Bicking, M.K.L., and Wilson, R.L., "High Performance Size Exclusion Chromatography in Environmental Method Development. 2. An Automated Procedure for Determination of Dioxins and Furans." Chemosphere 1991, **22**, 437.

Bicking, M.K.L., "A Simplified Experimental Design Approach to Optimization of SFE Conditions for Extraction of an Amine Hydrochloride." J. Chromatogr. Sci. 1992, **30**, 358.

Bicking, M.K.L., Hayes, T. L., Kiley, J., and Deming, S. N., "An Experimental Design Approach to the Optimization of Supercritical Fluid Extraction for the Determination of Oil and Grease in Soil." J. Chromatogr. Sci. 1993, **31**, 170.

Bicking, M.K.L., "Analytical Extractions of Organic Compounds." *Encyclopedia of Separation Science*, I. Wilson (Ed.), Academic Press, London, 2000.

Bicking, M., "On Second Thought." (A Parent Questions the Conventional Wisdom About Competitive Soccer.) *Soccer for Parents*, Scholastic Inc., September, 2000, pg. 14.

Bicking, M.K.L., "Integration Errors in Chromatographic Analysis. Part 1 - Peaks of Approximately Equal Size", LCGC Magazine, 2006, **24**, 402 - 414.

Bicking, M.K.L., "Integration Errors in Chromatographic Analysis. Part 2 - Large Peak Size Ratios", LCGC, , LCGC Magazine, 2006, **24**, 604 - 616.

**INVITED LECTURES:**

"Laser Fluorescence Determination of Aflatoxins on TLC Plates.", Bicking, M., Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy (PCACAS), Abstract No. 657, Advances in Thin Layer Chromatography Symposium, March 7-12, 1983.

"Coupled-Column System for Quantitating Low Levels of Aflatoxins.", Bicking, M., Eastern Analytical Symposium, November 16-18, 1983.

"Lasers and Thin Layer Chromatography - Present and Future.", Bicking, M., Eastern Analytical Symposium, November 16-18, 1983.

"Molecular Interactions on Polystyrene Stationary Phases.", Bicking, M., Department of Chemistry, Miami University, September 1986.

"Development and Evaluation of Methodology to Determine Formaldehyde in Samples of Environmental Origin.", Bicking, M., 40th ACS Southeast Regional Meeting, Abstract No. 198, November 9-11, 1988.

"Novel Analyte Enrichment Procedures for the Determination of PCDFs and PCDDs.", Bicking, M. Electric Power Research Institute (EPRI) PCDF/PCDD Workshop, Palo Alto, CA, June, 1990.

"Systematic Study of Extraction Conditions for SFE", M. Bicking, F. DeRoos, T. Hayes, 105 AOAC Annual International Meeting, Phoenix, AZ, August, 1991.

"Introduction to Environmental Analysis", F. DeRoos, M. Bicking, Minnesota Chromatography Forum Short-Course, Bloomington, MN, May, 1990.

"Traditional Sample Preparation - Old But Not Dead!", M. Bicking, Ohio Valley Chromatography Symposium, Hueston Woods State Park, OH, June, 1997.

"Outcome-Based Study Design", M. Bicking, Biomedical Focus, Minneapolis, MN, July, 1998.

"Chemical Characterization of Implantable Medical Devices," M. Bicking, A. Noreen, MD&M (Medical Device & Manufacturing), Minneapolis, MN Wed., October, 2007.

"How to Reduce Integration Errors in Chromatography (Lecture)," M. Bicking, Chromeleon International Users Symposium, Basel, Switzerland, October, 2007.

**PRESENTATIONS:**

"Solvent-Related Non-Exclusion Effects on Poly(styrene) Gels.", Bicking, M., Northeast Regional Chromatography Discussion Group (NERCDG), September 1983.

"A Multi-Derivative Method for the Determination of Organic Acids in Urine.", Adinolfi, N., and Bicking, M., PCACAS, Abstract No. 027, March 5-9, 1984.

"A Multi-Derivative Method for Analysis of Trace Organics.", Bicking, M., and Adinolfi, N., NERCDG, May 1984.

"Solvent Effects on the Exclusion Chromatographic Analysis of Small Molecules Using Poly(styrene) Gels.", Bicking, M., and Kubis, A., PCACAS, Abstract No. 551, March 5-9, 1984.

"Preconcentration and Analysis of Quaternary Ammonium Compounds by Ion Pairing Chromatography.", Bicking, M., and Rowehl, C. PCACAS, Abstract No. 073, March 5-9, 1984.

Gel Permeation Chromatography Discussion Section (Presider), NERCDG, September 1984.

"Development of a Gel Permeation Chromatography Clean-up Procedure for Priority Pollutant Analysis by Capillary Gas Chromatography.", Adams, J., and Bicking, M., PCACAS, Abstract No. 243, February 25-28, 1985.

"Solvent Effects on the Exclusion Chromatographic Separations of Small Molecules in Several Solvent Systems.", Bicking, M., and Adams, J. PCACAS, Abstract No. 310, February 25-28, 1985.

"Determination of Formaldehyde and Other Carbonyl Compounds in Liquid and Solid Environmental Matrices.", Bicking, M., Cooke, W., Kawahara, F., and Longbottom, J. Chemical and Biological Characterization of Municipal Sludges, Sediments, Dredge Spoils and Drilling Muds Symposium, Cincinnati, Ohio, May 20-13, 1986.

"Fractionation of Complex Environmental Samples Using Mobile Phase Effects in Size Exclusion Chromatography.", Bicking, M., PCACAS, Abstract No. 1152, March 9-13, 1987.

"Preparation and Characterization of a Chloroalkane Stationary Phase.", Bicking, M., PCACAS, Abstract No. 582, March 9-13, 1987.

"Determination of Formaldehyde in Liquid and Solid Environmental Matrices.", Bicking, M., Cooke, W., Kawahara, F., and Longbottom, J., PCACAS, Abstract No. 1150, March 9-13, 1987.

"Determination of Formaldehyde in Samples of Environmental Origin.", Bicking, M., Cooke, W., Kawahara, F., and Longbottom, J., Solid Waste Testing and Quality Assurance, US EPA Symposium, Washington, D.C., July 13-17, 1987.

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"A Coupled-Column System for Cleanup of Environmental Extracts - Determination of PCBs, Dioxins and Furans.", Bicking, M., and Wilson, R.L. PCACAS, Abstract No. 1005, February 22-26, 1988.

"Evaluation of Supercritical Fluid Extraction for Determination of PCDD's and PCDF's in Selected Matrices.", Bicking, M., and DeRoos, F. 12th Annual EPA Conference on Analysis of Pollutants in the Environment, Norfolk, VA, May 1989.

"Novel Analyte Enrichment Method for the Determination of PCDD's and PCDF's in Complex Matrices.", Bicking, M., and DeRoos, F. 12th Annual EPA Conference on Analysis of Pollutants in the Environment, Norfolk, VA, May 1989.

"Evaluation of Supercritical Fluid Extraction for Determination of PCDDs and PCDFs in Selected Matrices.", Bicking, M., Hayes, T., and DeRoos, F. Minnesota Chromatography Forum (MCF), Bloomington, MN, May 1990.

"Stabilization of Photoconductivity Detector Response for the Determination of Selected Analytes in Soil and Water.", Bicking, M., and Fisher, H. MCF, Bloomington, MN, May 1990.

"Optimization of Supercritical Fluid Extraction for the Determination of PCBs, PCDDs, and PCDFs in Soil.", Bicking, M. The International Conference on Organohalogen Compounds (Dioxin '90), Bayreuth, FRG, September 1990.

"Experimental Design Approach to Optimization of SFE Conditions", M. Bicking, T. Hayes, F. DeRoos, 3rd International Symposium on Supercritical Fluid Chromatography and Extraction, Park City, UT, January, 1991.

"Experimental Design Approach to Optimization of SFE Conditions", M. Bicking, T. Hayes, F. DeRoos, 12th Annual Environmental Laboratory Technology conference, St. Paul, MN, February, 1991.

"Experimental Design Approach to Optimization of SFE Conditions", M. Bicking, T. Hayes, F. DeRoos, PCACAS, Abstract No. 929, Chicago, IL, March, 1991.

"Evaluation of SFE for Extraction of Environmental Contaminants", M. Bicking, F. DeRoos, T. Hayes, 14th Annual EPA Conferences on Analysis of Pollutants in the Environment, Norfolk, VA, May, 1991.

"Optimization of Supercritical Fluid Extraction Conditions for Polychlorinated Compounds in Environmental Samples", M. Bicking, F. DeRoos, 11th International Symposium on Chlorinated dioxins and Related Compounds (Dioxin '91), Research Triangle Park, NC, September, 1991.

"Determination of Organochlorine Pesticides in Wastewater using Empore Disks and Supercritical Fluid Extraction", M. Bicking, F. DeRoos, J. Osterheim, E. Dooley, ACS National Meeting, San Francisco, CA, April, 1992.

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"Evaluation of a Modification to EPA Method 608 Using Solid-Phase Extraction Disks", 15th Annual EPA Conference on Analysis of Pollutants in the Environment, Norfolk, VA, May, 1992.

"A Simplified Experimental Design Strategy for Optimizing SFE Conditions", M. Bicking, 4th International Symposium on Supercritical Fluid Chromatography and Extraction, Cincinnati, OH, May, 1992.

"Optimized Determination of Plasticizers in PVC Samples by SFE", M. Bicking, J. Levy, 5th International Symposium on Supercritical Fluid Chromatography and Extraction, Baltimore, MD, January, 1994.

"SFE Optimization Strategies", M. Bicking and J. Levy, HPLC'94, Minneapolis, MN, May, 1994.

"Optimized Determination of a Sulfonated Dye by Reverse Phase Ion Pairing Liquid Chromatography", M. Bicking, MCF, Minneapolis, MN, May, 2002.

"Lessons Learned in Chromatographic Peak Integration", M. Bicking, MCF, Minneapolis, MN, May, 2005.

"Retention Effects for Cationic Analytes on PFP Stationary Phases in Very Dilute Acid Mobile Phases," M. Bicking, R. Henry, MCF, Minneapolis, MN, May, 2007.

"Relative Peak Size, Integration, and the Resolution Equation", M. Bicking, 29<sup>th</sup> International Symposium on Capillary Chromatography, Riva del Garda, Italy, May, 2006.

"HPLC Retention Effects for Cationic Analytes on PFP Stationary Phases in Dilute Acid Mobile Phases," PCACAS, New Orleans, LA, March, 2008.

#### **PROFESSIONAL MEMBERSHIPS:**

American Chemical Society  
Minnesota Chromatography Forum  
Member of the Intota Expert Network (formerly Teltech)  
Scientist Solutions (moderator)

#### **PERSONAL:**

In addition to a rather fanatical love for marching bands, I am also interested in performing trumpet music of the baroque era, particularly with organ accompaniment. I am also active in Kids & Chemistry, an outreach program of the American Chemical Society, coaching youth soccer, and writing about youth sports.