

Curriculum Vitae

Mark R. Schure

Chief Technology Office
Kroungold Analytical, Inc.

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RESEARCH SPECIALTIES:

Theoretical and experimental separation science
Computational chemistry, statistical physics
High performance computing hardware and software development including parallel processing, numerical methods, and database application development
Polymer and colloid chemistry and physics
Laboratory automation including high-throughput systems
Chemometrics

PRESENT STATUS:

Chief Technology Officer, Kroungold Analytical, Inc. (since 2012).
Adjunct Professor, Department of Chemical and Biomolecular Engineering,
University of Delaware, Newark, DE (since 1995).
Adjunct Professor, Department of Chemistry, Drexel University, Philadelphia, PA (since 2015)

INDUSTRIAL EXPERIENCE:

1984-1989, Principal Scientist, Digital Equipment Corporation, Marlborough, MA
1989-1994, Senior Scientist, Rohm and Haas Company, Springhouse, PA
1994-2005, Research Fellow, Rohm and Haas Company, Springhouse, PA
2005-2009, Distinguished Scientist, Rohm and Haas Company, Springhouse, PA
2009-2012, Distinguished Scientist, The Dow Chemical Company, Springhouse, PA
2012-Kroungold Analytical, Inc. Chief Technology Officer, Blue Bell PA

EDUCATION:

B. S. Chemistry, Northeastern University, 1971-1975.
Ph.D. Chemistry, Colorado State University, 1976-1981, Dissertation: The Effect of Temperature upon the Transformation of Polycyclic Organic Matter; Research Advisor: D. F. S. Natusch
Postdoctoral Fellow: University of Utah, Department of Chemistry, 1982-1983, Area of Study: Separation Science of Colloids and Macromolecules, Advisor: J. C. Giddings

PERSONAL INFORMATION:

Date and place of birth: May 28, 1952, Niskayuna, NY.

RECENT PROJECTS:

High Throughput Screening (HTS) software and hardware for heterogeneous catalysis
Two-dimensional chromatographic separations: theory, instrumentation and data analysis
Computational light scattering of colloidal material
Phase equilibria simulations for chromatographic retention estimation
Packed bed simulations of chromatography using the Lattice Boltzmann method and stochastic dispersion methods
High performance database applications, systems, complexity analysis
Colloidal hydrodynamics and mechanics including diffusion limited aggregation (DLA) and random sequential adsorption (RSA) models, power-law aggregation mechanics
Chromatographic particle research
Theoretical Separation Science: pore diffusion, multidimensional orthogonality, statistical overlap theory, granular materials separation theory

SOFTWARE EXPERTISE AND EXPERIENCE:

40+ years FORTRAN 66/FORTRAN 77/FORTRAN 95
10+ years Microsoft Visual Basic (VB6 and VB.NET)
14+ years Microsoft Windows NT/2000/XP/7 and internals
4 years HTML, CGI, Perl, Python, Web technologies
20+ years Unix/Linux systems and programming
20 years VMS and internals
10 years RT-11, RSX-11, DEC-20 experience
25 years PDP-11, PDP-8, VAX Assembly language
10+ years parallel processing with MPI on large cluster systems
10+ years MATLAB programming, extensive use of numerical toolboxes, graphics
10+ years Microsoft SQL Server and ADO development
10+ years Graphics support: ray-tracing (POV-Ray) programming
2 years C/C++ programming
2 years LISP/Scheme string processing

AWARDS and PROFESSIONAL ACTIVITIES:

Coloradoan: 1976-1977, State of Colorado
Arthur K. Doolittle Award, Polymeric Materials Science and Engineering division of the American Chemical Society, 1992.
Northeastern University, Distinguished Alumni in Chemistry Lecturer Award, 1993
Doug Leng Award in basic engineering research, The Dow Chemical Company, 2011
L. S. Palmer award for innovations in chromatography 2012, received from the Minnesota Chromatography Forum.
Eastern Analytical Symposium (EAS) award in separation science 2013.
Stephen Dal Nogare award in chromatography 2015, given by the Chromatography Forum of the Delaware Valley at the 2015 Pittsburgh conference
Uwe D. Neue award in chromatography 2015, sponsored by the Waters Corp., presented at HPLC 2015, Geneva, Switzerland.

Member, American Chemical Society 1974-present
Member, American Physical Society 1983-present

RECENT CLASSES TAUGHT AT UNIVERSITY OF DELAWARE:

Fall 2014, Fall 2015: CISC 167: Introduction to computer programming for chemical engineering honors students.

SENIOR THESIS ADVISOR, UNIVERSITY OF DELAWARE, CHEMICAL ENGINEERING:

J. T. Nitsche 2016, T. J. Shields 2017, M. Beauchamp 2018.

RECENT CLASSES TAUGHT AT DREXEL UNIVERSITY:

Winter 2016: CHEM 531: Analytical separation science.

CLASSES TAUGHT AT CONFERENCES:

Multidimensional liquid chromatography: half-day course: ISPPP 2011, ISPPP 2013, whole day course: HPLC 2010, 2012, 2014, 2016

CURRENT GRANTS:

NSF GOALI Grant CHE-9816328, Retention Processes in Gas-Liquid and Reversed-Phase Liquid Chromatography. A Molecular Simulation Study J. I. Siepmann (U. Minnesota), M. R. Schure (Rohm and Haas Co.). Began June 1, 1999. Total funding through 3 years:\$266,000. Renewed, June 2002 under the GOALI grant CHE-0213387, renewed 2007 under the GOALI grant CHE-0718383. Renewed 10/1/2015-2016 under the GOALI grant CHE-1152998.

NIH/SBIR Grant 2 R44 GM108122-02, Non-spherical particles for HPLC, Barry Boyes and Jack Kirkland (Advanced materials Technology, Inc.), Mark R. Schure (Kroongold Analytical, Inc.) and Robert S. Maier (R. S. Maier Consulting, LLC) , \$1,300,00 June 2015-2018.

ACS Analytical Division Symposia Manager:

1993 Symposium on molecular modeling in chromatography (Denver)

1995 Symposium in memory of J. Calvin Giddings (Las Vegas)

2017 Symposium on chromatographic stationary phases (Washington, D.C.)

CONFERENCE ACTIVITIES:

Scientific and Planning Committee: International Symposium on the Separation of Proteins, Peptides, and Polynucleotides (ISPPP 2001), Orlando, Florida, November 11-14, 2001.

Scientific Committee: 27th International Symposium on High Performance Liquid Phase Separations and Related Techniques (HPLC 2003) Nice France, June 15-19, 2003.

Chairman, International Symposium on the Separation of Proteins, Peptides, and Polynucleotides, (ISPPP 2003), Delray Beach, Florida, November 9-12, 2003.

Chairman, 28th International Symposium on High Performance Liquid Phase Separations and Related Techniques (HPLC 2004) Philadelphia, Pennsylvania, June 12-18 2004.

Chairman, International Symposium on the Separation of Proteins, Peptides, and Polynucleotides, (ISPPP 2005), St. Pete's Beach, Florida, November 6-9, 2005.

Chairman, International Symposium on the Separation of Proteins, Peptides, and Polynucleotides, (ISPPP 2007), Orlando, Florida, October 21-24, 2007.

Chairman, International Symposium on the Separation of Proteins, Peptides, and Polynucleotides, (ISPPP 2009), Del Ray Beach, Florida, October 23-26, 2009.

Scientific Committee: 34th International Symposium on High Performance Liquid Phase Separations and Related Techniques (HPLC 2010) Boston, June 19-24, 2010.
Scientific Committee: 35th International Symposium on High Performance Liquid Phase Separations and Related Techniques (HPLC 2011) Budapest, Hungary, June 19-23, 2011.
Organizing committee, 44th International Symposium on High Performance Liquid Phase Separations and Related Techniques (HPLC 2016) San Francisco, California, June 19-24 2016.
Organizing committee, 47th International Symposium on High Performance Liquid Phase Separations and Related Techniques (HPLC 2018) Washington, D.C. July 29-Aug 2, 2016.

INVITED TALKS 1995-2017:

1. American Chemical Society, Colloid Conference, Salt Lake City, 1995.
2. Minnesota Chromatography Forum, Minneapolis, Minn., 1995.
3. University of Minnesota, 1995.
4. University of Massachusetts, 1995.
5. Xerox Research Laboratory of Canada, 1996.
6. HPLC '96, San Francisco, 1996.
7. American Chemical Society meeting, Orlando, 1996.
8. FFF '96, Ferrara, Italy, 1996.
9. Massachusetts Institute of Technology, Physical Chemistry department seminar, 1997.
10. Conference on Environmental Analytical Chemistry, GA, 1997.
11. American Chemical Society meeting, Las Vegas, 1997.
12. FACCS '97, 1997.
13. University of Rhode Island, department of chemistry, 1998.
14. American Chemical Society meeting, Dallas, 1998.
15. HPLC '98, St. Louis, 1998.
16. University of Delaware, Dept. of Chemistry, 1998.
17. HPLC '99, Granada, Spain 1999.
18. Minnesota Chromatography Forum, Minneapolis, Minn., 1999.
19. FFF '99, Paris, France.
20. HPLC 2000, Seattle, 2000.
21. PREP 2001, Washington, DC, 2001.
22. HPLC 2001, Maastricht, The Netherlands, 2001.
23. HPLC 2003, Nice, France 2003.
24. Chromatography Forum of the Delaware Valley, Philadelphia, 2004.
25. HPLC 2004, Philadelphia, (Chairman).
25. American Association of Pharmaceutical Science, Baltimore 2004.
26. American Chemical Society meeting, Washington 2005.
27. Pharmaceutical Bioanalysis, 2005, Baltimore 2005.
28. ISPPP 2005, St. Pete's Beach, 2005 (Chairman).
29. Pittsburgh Conference, Orlando Florida, 2006.
30. Preparative Chromatography 2006 Conference, Baltimore, 2006.
31. HPLC 2006, San Francisco, 2006.
32. U. Arizona department of chemistry, Tuscon, AZ, Jan. 2007.
33. HPLC 2008, Baltimore, May 2008.
34. American Chemical Society meeting, Philadelphia, 2008.
35. Virginia Commonwealth University, November, 2008.

36. Chromatography Forum of the Delaware Valley, December, 2008.
37. Horvath Symposium, April 2009.
38. Department of Chemistry, Drexel University, April 2009.
39. Eastern Analytical Symposium, November 2009.
40. Horvath Symposium, April 2010.
41. HPLC 2010, Boston, June, 2010.
42. ISPPP 2010, Bologna, Italy, 2010.
43. Eastern Analytical Symposium, November 2010.
44. Minnesota Chromatography Forum, keynote speaker, May 2011.
45. HPLC 2011, tutorial lecture, Budapest, Hungary, June 2011.
46. ISPPP 2011, Alexandria, Virginia, October 2011.
47. Chromatography Forum of the Delaware Valley, February 2012.
48. Minnesota Chromatography Forum, May 2012.
49. HPLC 2012, Anaheim, CA, June 2012.
50. Pittsburgh conference, Orthogonal separations organizer and speaker, Philadelphia 2013.
51. HPLC 2013, Amsterdam, The Netherlands 2013.
52. Eastern Analytical Symposium, Separations Science award symposium, 2013.
53. Minnesota Chromatography Forum, May 2014.
54. HPLC 2014, New Orleans, 2014.
55. Conference on capillary chromatography, Riva del Garda, Italy 2014.
56. Pittsburgh conference, Dal Nogare award session, March 2015.
57. HPLC 2015, Geneva Switzerland, Uwe. D. Neue award session, June 2015.
58. Conference on capillary chromatography, Riva del Garda, Italy 2016.
59. HPLC 2016, San Francisco, June 2016.
60. Horvath Symposium 2016, Connecticut, October 2016.
61. Chromatography Forum of the Delaware Valley Spring Symposium, April 20, 2017.
62. HPLC 2017, Prague, June 2017.
63. ACS Symposium on Chromatographic Stationary Phases, August 2017, Washington DC
64. Eastern Analytical Symposium, November 2017.

PATENTS:

1. Capillary Electrochromatography Separation Media Mark Richard Schure and Willie Lau. Rohm and Haas Co., Sept. 12, 2000, Patent No. 6,117,326.
2. Methods and Systems for High Throughput Analysis Michael W. Linsen, Edward A. Schmitt, and Mark Richard Schure, May 31, 2005, Patent No. 6,901,334.
3. An Automated System and Process for the Preparation of a High Viscosity Fluid Formulation Michael W. Linsen, Mark Richard Schure, Kristin Weidemaier, April 18, 2006, Patent No. US 7,029,164 B2.
4. Method and System for Analyzing Coatings Undergoing Exposure Testing Michael W. Linsen, Edward A. Schmitt, Mark Richard Schure, Sept. 30, 2008, Patent No. US 7,430,485 B2.

MOVIES:

1. Schure, M. R. Computer Simulation of Field-Flow Fractionation Copyright 1987, Digital Equipment Corporation, Maynard, MA.
2. Schure, M. R. Molecular Dynamics Simulation of Liquid Chromatography Copyright 1992, Rohm and Haas Company, Philadelphia, PA., look on YouTube – search on “bonded-phase.”

3. Schure, M. R. Biotin/Single-Stranded DNA: Motional study for Affinity Chromatography Copyright 1992, Rohm and Haas Company, Philadelphia, PA.
4. Schure, M. R., Palkar, S. A. Simulation of Electrical Field-Flow Fractionation Copyright 1995, Rohm and Haas Company, Philadelphia, PA.
5. Schure, M. R. Focused Ion Beam etching of a core-shell particle, University of Delaware, 2015, Newark, DE