



Michael G. Koehler, Ph.D., ACSF

Principal Scientist

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2011 – Present Professional Analysis and Consulting, Inc., Lisle, IL

Principal Scientist and Managing Partner

Performs litigation related investigations involving materials, chemicals, and chemical health & safety. Investigations include materials failure analyses and consequences involving hazardous chemicals, metals, polymers, rubber & plastics, composites, coatings, aerosol systems and propellants, air quality. Program experiences have included product liability, building carbon monoxide/indoor air quality, toxic tort, intellectual property, transport regulations, product warnings and labels, and regulations related to the chemistry and materials enterprise.

2008 - 2010 Packer Engineering, Inc., Naperville, IL

Chief Executive Officer

Strategic leadership for this engineering consulting firm which provides technical solutions to problems in product design and manufacturing processes. Technical investigations focused on critical issues involving polymers, rubbers, plastics, air quality, construction materials, as well as industrial materials and chemistries. Technical investigations included failure analysis, intellectual property, the insurance and legal communities, government, and academic organizations.

2005 - 2008 Honeywell Aerospace, Des Plaines, IL

Director, Advanced Materials and Processes

Responsibilities included strategic leadership of the Aerospace Materials and Process Research and Technology teams in Morristown, NJ, and Des Plaines, IL. Aerospace Advanced Materials and Process technology development program included innovations for polymers and plastics, elastomers and rubber, composites, membranes, fuels and fuel systems, cabin/building air management systems, chemical separations, advanced coatings, alloys & catalysts. This also included oversight of Black Belt and Green Belt scientist and engineers for Design for Six Sigma, Design for the Environment, Design for Manufacturing programs, and Lean Six Sigma.

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**1998 – 2005 Center for Catalysis and Separations Technologies, Honeywell
Aerospace, Engines and Systems, Des Plaines, IL**

Senior Technical Manager

Responsibilities included research and leadership in aerospace environmental control systems, space life support systems, air quality technology, water treatment technologies, fuel cell technologies, chemical demilitarization, chem/bio protection, process chemistry and engineering, polymerization catalyst, catalytic oxidation processes, adsorptive separations, membrane separations.

**1996 – 1998 Chemical Process Technologies, AlliedSignal (Honeywell
predecessor company), Research and Technology, Des Plaines, IL**

Skill Center Leader

Responsibilities included research and technical leadership in aerospace environmental control systems, space life support systems, air quality technology, water treatment technologies, fuel cell technologies, chemical demilitarization, chem/bio protection, process chemistry and engineering, polymerization catalyst, catalytic oxidation processes, adsorptive separations, membrane separations.

**1995 – 1996 Modeling and Simulations Technologies, AlliedSignal (Honeywell
predecessor company), Research and Technology, Des Plaines, IL**

Skill Center Leader

Responsibilities included research and technical leadership in process and chemical modeling and simulations, statistical process controls, Six Sigma Continuous Process Improvement strategies, molecular modeling and quantum chemistry simulations, advanced process controls and process optimization.

**1994 - 1995 Thermosets and Composites, AlliedSignal, Research and
Technology, Des Plaines, IL and Morristown, NJ**

Skill Center Leader

Responsibilities included research and leadership in printed circuit board laminate composites, thermoset resins formulations, rubber composites, engineered plastics composites, advanced polymeric fibers, ballistic materials composites.

**1992 - 1996 AlliedSignal, Research and Technology, Des Plaines, IL and
Morristown, NJ**

Total Quality Master Trainer (Master Black Belt)

Coordinator and trainer for the deployment of the R&D Total Quality Program with emphasis on Six Sigma statistical modeling and process/product analysis. This included the training and certification of Six Sigma Green Belts and Black Belts.

1991 - 1994 AlliedSignal, Research and Technology, Des Plaines, IL

Senior Research Chemist

Responsibilities included research and leadership in modeling applications for new product development (thermoplastics, thermosets, coatings, fiber finishes, radiation-cured polymers), CFC (refrigerants and solvents) alternatives, new technology tools development (toxicology estimations, advanced polymer theories, Materials by Design, Polymers by Design, Advanced Fuels Properties), software maintenance and management.

1987 - 1991 AlliedSignal, Research and Technology, Des Plaines, IL

Research Chemist

Responsibilities included research and applications in: molecular modeling and design, new product development, engineering analysis, database development, statistical analysis.

**1984 – 1987 G. D. Searle Research and Development; Drug Design Section,
Department of Medicinal Chemistry**

Programming and Applications Consultant

Programming and applications in Drug Design, DEC VAX systems, Evans and Sutherland PS300, CHEMLAB-II, MOGLI, Gaussian-80, PRDDO, MM2, MACCS, REACCS, VAX program conversions, program parameterization.

**1985 - 1987 Intersoft Incorporated, Lake Forest, IL and CHEMLAB
Incorporated, Lake Forest, IL.**

Programming and Applications Consultant

Programming and applications in DEC VAX systems, Macintosh software development, graphics development, program conversions, parameterization. Program development on the CHEMLAB-II molecular modeling software.

1986 – 1987 University of Illinois, Department of Medicinal Chemistry

Post-Doctoral Research Associate

Research applications in polymer modeling and drug design, Monte Carlo molecular simulations, Quantitative Structure Property Relationships/ Quantitative Structure Activity Relationships (QSPR/QSAR).

1982 – 1986 University of Illinois, Department of Medicinal Chemistry

Research Assistant/Teaching Assistant

Programming and applications in VAX Systems, Evans and Sutherland PS300, IBM Systems, PC Systems, CHEMLAB-II, MM2, database development, and various molecular modeling programs, Organic synthesis and testing of cannabinoid based analgesics. Courses Assisted: Physics, Organic Chemistry, Analytical Chemistry, Biochemistry, Physical Chemistry, and Medicinal Chemistry.

ACADEMIC

Ph.D. in Chemistry, University of Illinois, 1986.

B.S. in Chemistry, B.S. Mathematics, and B.S. Computer Science, Loyola University of Chicago, 1982.

AFFILIATIONS and HONORS

Fellow of the American Chemical Society (ACS) – Contributions to the Science / Profession: For corporate leadership as Director of Advanced Materials at Honeywell Aerospace and development of the Koehler-Hopfinger molecular modeling theories for predictions of material properties. **Contributions to the ACS Community:** For service to the ACS Committee on Chemical Safety, the Chicago Section as Chair, Councilor and Director, and leadership in Illinois for Public Policy advocacy.

- Committee on Chemical Safety
 - Chemistry and the Law Division
 - Division of Chemical Health and Safety
 - 2013 Chair of the Chicago Section of the ACS
 - 2021 Vice Chair of the Chicago Section of the ACS
 - 2022 Chair Science Division of the Chicago Section ACS
 - Public Affairs Committee - Chicago Section Chair
- American Association for the Advancement of Science (AAAS)
Society for Plastics Engineers (SPE)
ASM International (ASM)
SAE International (SAE)

OTHER ACTIVITIES

Chair (2013) – Chicago Section of the American Chemical Society – The American Chemical Society (ACS) is the world's largest scientific society and the leading professional society for chemistry worldwide. The Chair of the Chicago Section provides leadership to 5000 member local chapter through workshops, lectures, scholarships, academic advisers and public relations.

National Science Advisory Board – Loyola University of Chicago – The National Science Advisory Board is a 12 member panel that serves at the request of the University President and provides advice on the scientific curriculum and development programs of the University. 2003-2007

SECURITY CLEARANCE LEVEL

SECRET as issued by DISCO

PATENTS

1. Koehler, M.G. with Bedwell, W.B., Calcaterra, L.T., Farishta, Q., Green, G.D., Hangey, D.A., and Koljack, M.P., Method to Impart Coffee Stain Resistance to Polyamide Textile Substrates, U.S. Patent # 5,118,551, June 2, 1992.
2. Koehler, M.G. with Calcaterra, L.T., Koljack, M.P., Bedwell, W.B., Farishta, Q., Green, G.D., and Hangey, D.A., Method to Impart Coffee Stain Resistance to Polyamide Fibers. U.S. Patent #5,135,774, August 4, 1992.
3. Koehler, M.G., with Calcaterra, L.T., Koljack, M.P., Farishta, Q., Bedwell, W.B., Hangey, D.A., and Green, G.D., Method to Impart Coffee Stain Resistance to Polyamide Textile Substrates, U.S. Patent #5,359,010, October 25, 1994.

PUBLICATIONS

1. Koehler, M.G., with Dunn, W.J., and Wold, S.: Applications of SIMCA Pattern Recognition to Complex Chemical Data. In Proceedings; National Symposium on Recent Advances in Pollutant Monitoring, ed. T. Hauser, pp. 131-139. Research Triangle Park, NC., U.S. EPA., 1984.
2. Koehler, M.G., with Pearlstein, R.A., Malhotra, D., Orchard, B.J., Tripathy, S., Potenzzone, R., Mabilia, M., Grigoras, S., Doherty, D., Harr, R., Hopfinger, A.J.: Three Dimensional Structure Modeling and Quantitative Molecular Design Using CHEMLAB-II, in Proceedings of 2nd Cyprus Conference on New Methods in Drug Research, ed. A. Makriyannis, Barcelona, J. Prous Internat., Press, 1985.
3. Koehler, M.G., with Dunn, W.J., and Stalling, D.: Relationship between Molecular Size and Retention Times Using Capillary Gas Chromatography, Anal. Chem., 5: 1835-1838, 1986.
4. Koehler, M.G., with Dunn, W.J., Emery, S.L., Scott, D.R.: Application of Pattern Recognition to Mass Spectral Data of Toxic Organic Compounds in Ambient Air, Chemomet, Intell., Lab. Systems, 1987.
5. Koehler, M.G., with Dunn, W.J., Grigoras, S.: The Role of Solvent Accessible Surface Area in Determining Partition Coefficients. J. Med. Chem., 30: 1987.
6. Koehler, M.G., with Mabilia, M., Pearlstein, R.A., Hopfinger, A.J.; Computer-Aided Molecular Modeling of Polymers; III. Enthalpy of Polymerization as a Measure of Stability. J. Macromol. Sci.-Phys., Ed.: B26, 463-506, 1987.
7. Koehler, M.G., with Hopfinger, A.J., Lopez de Campadre, R.L., Emery, S. An extended QSAR Analysis of Some 4-Aminodiphenylsulfone Antibacterial Agents Using Molecular Modeling and LFE-Relationships. Quant. Struct.-Act. Relat., 6, 111-117, 1987
8. Koehler, M.G., with Grigoras, S. and Dunn, W.J.: The Relationship between Chemical Structure and the Logarithm of the Partition Coefficient. Quant. Struct.-Act. Relat., 7, 150-159, 1988.

9. Koehler, M.G., with Hopfinger, A.J., Seydel, J.K.; A Comparison of QSARs Proposed for the Inhibition of Dihydropteroate Synthase by Substituted 4-Aminodiphnylsulfones. J. Mol. Sturct. (Theochem)., 179, 319-332, 1988.
10. Koehler, M.G., with Hopfinger, A.J., Pearlstein, R.A., Tripathy, S.K.: Molecular Modeling of Polymers. IV. Estimation of Glass Transition Temperatures. J. Polymer Sci. Part B: Phys., 26, 2007-2028, 1988.
11. Koehler, M.G., with Rowberg-Schaefer, K., Hopfinger, A.J.: A Molecular Shape Analysis and QSAR Investigation of Some Triazine - Antifolate Inhibitors of Leishmania Dihydrofolate Reductase. Arch. Biochem and Biophys., 266, 152-161, 1988.
12. Koehler, M.G., with Pearlstein, R.A., Malhotra, D., Orchard, B.J., Tripathy, S.K., Potenzzone, R., Grigoras, S., Mabilia, M., Walters, D.E., Doherty, D., Harr, R., Hopfinger, A.J.: Three-dimensional structure modeling and quantitative molecular design using CHEMLAB-II: in New Methods in Drug Research. Vol 2., Alexandros Makriyannis, Ed., J.R. Prous Science Publishers, Barcelona, Spain, 1988.
13. Koehler, M.G., with Hopfinger, A.J.: Molecular Modeling of Polymers. 5. Inclusion of Intermolecular Energetics in Estimating Glass and Crystal Melt Transition Temperatures. Polymer, 30, 116-126, 1989.
14. Koehler, M.G., with Ryther, J.J.: New Graphy Theory Methods for Predicting Fuel Properties, PREPRINTS (Division of Petroleum Chemistry, A.C.S.), 34 (4), 856-857, 1989.
15. Koehler, M.G., with Donner, J.T., Souze, J.W., Squire, K.R.: A Comparative Survey of Fuel Property Prediction Methods, PREPRINTS (Division of Petroleum Chemistry, A.C.S.), 34 (4) 850-851, 1989.
16. Koehler, M.G., with Hammond, W.B.: Simulation of Structures and Properties of Polyamides, Polymer Preprints, 30 (2), 51-52, 1989.
17. Koehler, M.G., with Burke, B.J., Rowberg, K., Cardoza, M.G., Hopfinger, A.J.: New Methods in Molecular Shape Analysis to Identify and Characterize Active Conformations, in OSAR in Design of Bioactive Compounds, M. Kuchar, Ed., 111-129, J.R. Prous Science Publ., Barcelona, Spain, 1992.
18. Koehler, M.G. with Hopfinger, A.J., Estimation of the Phase Behavior of Binary Polymer Mixtures Using TAU Theory, Proceedings: Polymeric Materials: Science and Engineering, American Chemical Society, Washington, D.C., August 1993.
19. Koehler, M.G., with Hopfinger, A.J.: Molecular Modeling of Polymers 9, Description and Application of Torsional Angle Unit Theory to Predict Polymer Properties, Computer Simulations of Polymers., In: Polymer Simulations, E. Colbourne, Ed., Longman Higher Education, London, 1994.
20. Koehler, M.G., with Hopfinger, A.J., and Rogers, David: Molecular Modeling of Polymers 13, Multicomponent Polymeric Systems, Macromolecular Simulations, American Chemical Society, Washington, D.C 1994.

21. Koehler, M.G., with Hopfinger, A.J., and Rogers, David: Molecular Modeling of Polymers 14, QSPR Analysis of Multicomponent Systems Containing Polymers, Macromolecular Symposia, 98, 1087-1100, 1995.
22. Koehler, M.G. with, Yates, S.F., Tonev, T., and Lupton, F.S.: Photocatalytic Oxidation for Aircraft Cabin and Indoor Pollutant Control, Indoor Air, 15, 157-190, 2005.
23. Koehler, M.G. with Shipley, R. and Hicks, T.: Timely Involvement of Technical Experts, Chicago Lawyer, Vol 37, No 10, Oct. 2014.
24. Koehler, M.G. with Tator, K.: Alkyd Resins, ASM Handbook, Volume 5B-Protective Organic Coatings, 39 – 47, 2015.
25. Koehler, M.G. with McFarland, N. et al. Ames for Space, International Space Station Research Report, Center for the Advancement of Science in Space (CASIS), 2017.
26. Koehler, M.G. Guidelines for Writing a Case Study, ACS Chem. Health Saf. 2020, 27, 3-7.

RECENT PRESENTATIONS

Koehler, M.G.: Investigating Chemistry-Related Incidents: A Structured Approach to Incident Evidence and Analysis. Seminar, University of Wisconsin, 2019.

Koehler, M.G. with Elston, H.: Why it went wrong: Blame-free Investigations of Lab-Scale Incidents. Chemical Health and Safety Workshop, American Chemical Society, Annual Workshop: 2019-2022.

Koehler, M.G. with Shipley, R.J. and Hicks, T.M.: Testing: Techniques and Examples, Making Evidence-Based Decisions, American Society for Quality Seminar, 2019.

Koehler, M.G. Plastics Failure Analysis: Analytical Techniques and Tools, American Chemical Society, 2015.

Koehler, M.G. Chemists in the Courtroom. American Chemical Society, 2014.

Koehler, M.G. Chemistry and the Law: Applications of Science in Litigation. Invited Speaker, Chicago Section of the American Chemical Society, 2010.

Koehler, M.G., et al.: Lasers for Scene Documentation, Defense Research Institute, 2009.