

JANET YANOWITZ, P.E., Ph.D.

**Principal Engineer
Ecoengineering, Inc.**

Phone: 303-619-4346

Email: ecoeng.yano@gmail.com

EDUCATION AND PROFESSIONAL QUALIFICATIONS:

- Ph.D. in Environmental Science and Engineering, Colorado School of Mines, Golden, Colorado
- B.S. in Chemical Engineering, Massachusetts Institute of Technology, Cambridge, Massachusetts
- Professional Engineer, Colorado and Washington

EXPERTISE:

- Heavy-Duty and Light-Duty Motor Vehicle Emissions
 - Effect of Oxygenated Fuels on Emissions
 - Renewable Fuel Properties
-

EMPLOYMENT SUMMARY:

Ecoengineering, Principal, 2006 to Present

Cameron-Cole, LLC, Senior Engineer, Boulder, Colorado, 2001 to 2007

Colorado School of Mines, Golden, Colorado, 1997 to 2001

USPCI / Laidlaw Environmental Services, Boulder, Colorado, 1991 to 1997

Geotrans, Boulder, Colorado, 1989 to 1991

Badger Engineers, Inc., Cambridge, Massachusetts, 1987 to 1989

International Institute of Applied Systems Analysis, Laxenburg, Austria. Young Scientists
Summer Program, 1987

SELECTED PUBLICATIONS AND PRESENTATIONS:

Invited Speaker, U.S. Senate Environment and Public Works Committee Hearing, "Impact of Using E15 in place of E10 on the Emission of Ozone Forming Compounds," June 14, 2017.

Yanowitz, J. and R.L. McCormick, "Review: Fuel Volatility Standards and Spark-Ignition Vehicle Driveability", *SAE Int J. Fuels Lubr.* 9(2):408-429, 2016.

McCormick, R., Fioroni, G., Fouts, L., Christensen, E. Yanowitz, J. et al., "Selection Criteria and Screening of Potential Biomass-Derived Streams as Fuel Blendstocks for Advanced Spark-Ignition Engines," *SAE Int. J. Fuels Lubr.* 10(2):2017.

Tian, M., R.L. McCormick, M.A. Ratcliff, J. Luecke, J. Yanowitz et al., "Performance of lignin derived compounds as octane boosters", *Fuel*, February 1, 2017.

Alleman, T.L., R.L. McCormick, J. Yanowitz, "Properties of Ethanol Fuel Blends Made with Natural Gasoline" *Energy & Fuels* 29(8), July 2015.

McCormick, Robert, M. Ratcliff, E. Christensen, L. Fouts, J. Luecke, G. Chupka, J. Yanowitz, M. Tian, M. Boot, "Properties of Oxygenates Found in Upgraded Biomass Pyrolysis Oil as Components of Spark and Compression Ignition Engine Fuels," *Energy & Fuels*, 29 (4), 2453–2461, 2015.

Yanowitz, J., M.A. Ratcliff, R.L. McCormick, J.D. Taylor, M.J. Murphy, Compendium of Experimental Cetane Numbers, NREL/TP-5400-67585, February 2017.

McCormick, R.L., J. Yanowitz, M. Ratcliff, B.T. Zigler, Review and Evaluation of Studies on the Use of E15 in Light-Duty Vehicles, Renewable Fuels Association, October 2013.

Ratcliff, M., J. Luecke, A. Williams, E. Christensen, J. Yanowitz, A. Reek, R. McCormick, "Impact of Higher Alcohols Blended in Gasoline on Light-Duty Vehicle Exhaust Emissions," *Environ. Sci. & Tech.*, 47 (23), 13865–13872, 2013.

Yanowitz, J., K. Knoll, J. Kemper, J. Luecke, R.L. McCormick, "The Impact of Adaption on Flex-Fuel Vehicle Emissions When Fueled with E40," *Environ. Sci. & Tech.*, 47 (6), 2990–2997, 2013.

McCormick, R.L., Yanowitz, J. "Discussion Document - Effect of Ethanol Blending on Gasoline RVP," Renewable Fuels Association, March 2012.

McCormick, R.L., Yanowitz, J. "Effect of 15% Ethanol Blends (E15) on Anti-Knock Index," Appendix B in E15 Retailer Handbook, Renewable Fuels Association, November 2011.

Yanowitz, J., E. Christensen, R.L. McCormick, Utilization of Renewable Oxygenates as Gasoline Blending Components, NREL/TP-5400-50791, National Renewable Energy Laboratory: Golden, CO., August 2011.

- Christensen, E., J. Yanowitz, M. Ratcliff, R. L. McCormick, "Renewable Oxygenate Blending Effects on Gasoline Properties," *Energy & Fuels*, August 2011.
- Chupka, G.M., J. Yanowitz, G. Chiu, T.L. Alleman, R.L. McCormick, "Effect of Saturated Monoglyceride Polymorphism on Low-Temperature Performance of Biodiesel," *Energy & Fuels*, January 2011.
- McCormick, R., Alleman, T., Yanowitz, J. "Impact of Biodiesel Fuel on Pollutant Emissions from Diesel Engines", in Biodiesel Handbook, AOCS, 2010.
- Yanowitz, J. and R.L. McCormick, "Effect of biodiesel blends on North American heavy-duty diesel engine emissions," *European Journal Lipids and Technology*, August 2009
- Yanowitz, J. and R. McCormick, "Effect of E85 on Light Duty Vehicle Tailpipe Emissions", *J. Air and Waste Manage. Assoc.*, February 2009.
- Ireland, J., R.L. McCormick, J. Yanowitz, and S. Wright. "Improving Biodiesel Emissions and Fuel Efficiency with Fuel-Specific Engine Calibration," Society of Automotive Engineers International Congress, Detroit, MI, April 2009.
- Contributor to: NREL, Biodiesel Handling and Use Guide, Fourth Edition, 2008.
- McCormick, R., Williams, A., Ireland, J., Yanowitz, J. "Overview of Recent Emission Testing Results for Biodiesel and E85", 23rd Annual Clean Air Conference", September 27, 2007, Breckenridge, CO.
- Chiaravalli, J., Yanowitz, J., Sasala, C., Olesen, A. "Meeting Commitments for Greenhouse Gas Emissions Reduction and Business Goals," 2003 Railroad Environmental Conference, November 4-6, 2003.
- Yanowitz, J. "Particulate Matter Emissions during Transient Locomotive Operation: Preliminary Study," *J. Air and Waste Manage. Assoc.* Vol 53: 1241-1247, 2003.
- Contributor to: EPA, Health Assessment Document for Diesel Engine Exhaust, EPA/600/8-90/057F, 2002.
- Yanowitz, J., M.S. Graboski, R.L. McCormick, "Prediction of In-Use Emissions of Heavy-Duty Diesel Vehicles from Engine Testing," *Environmental Science and Technology*. (36) 270, 2002.
- Yanowitz, J., R.L. McCormick, M.S. Graboski, "Critical Review: In-Use Emissions from Heavy-Duty Diesel Vehicles," *Environmental Science and Technology*. (34) 729, 2000.
- McCormick, R.L. , M.S. Graboski, T.L. Alleman, J. Yanowitz, "Idle emissions from heavy-duty diesel and natural gas vehicles at high altitude," *J. Air & Waste Manag. Assoc.*, 50 (11), 2000.
- Yanowitz, J., M.S. Graboski, L.B.A. Ryan, T.L. Daniels, R.L. McCormick, "Chassis Dynamometer Study of Emissions from 21 In-Use Heavy-Duty Diesel Vehicles," *Environmental Science*

and Technology. Vol. 33, pg. 209, 1999.

McCormick, R.L., L.B.A. Ryan, T. Daniel, J. Yanowitz, M.S. Graboski, Comparison of Chassis Dynamometer In-Use Emissions with Engine Dynamometer FTP Emissions for Three Heavy-Duty Diesel Vehicles, SAE Paper No. 982653, 1998.

Ayres, R.U., V. Norberg-Bohm, J. Prince, W.M. Stigliani, and J. Yanowitz, "Industrial Metabolism, the Environment, and Application of Materials-Balance Principles for Selected Chemicals," International Institute of Applied Systems Analysis Research Report: RR-89-11, 1989.

Invited Speaker, "What's New in the Clean Air Act for Environmental Compliance Professionals," ACHMM Conference, Las Vegas, Nevada, August 1, 2004.

Invited Speaker, "In-Use Emissions from Heavy-Duty Diesel Vehicles," Congressional Clean Air Act Advisory Council, Mobile Sources Technical Review Subcommittee, Arlington, VA, July 1999.