S. KENT HOEKMAN
Research Professor
Desert Research Institute
Division of Atmospheric Sciences
2215 Raggio Parkway, Reno, NV 89512-1095

Tel: 775-674-7065
Fax: 775-674-7016
email: Kent.Hoekman@dri.edu

Education

Ph.D.	1980	Iowa State University, Ames, IA	Organic Chemistry
B.S.	1975	Calvin College, Grand Rapids, MI	Chemistry

Professional Interests and Activities

Dr. Hoekman is a Research Professor within the Division of Atmospheric Sciences at the Desert Research Institute (DRI). DRI is a statewide division of the Nevada System of Higher Education (NSHE) that pursues basic and applied environmental research on local, national, and international scales. His professional interests include environmental impacts of energy production, distribution, and use; development of renewable and sustainable energy systems; conversion of biomass to biofuels; air quality impacts of vehicle emissions; and impacts of advanced-technology fuels and vehicles on emissions and energy use. He is also interested in the interface between politics and environmental science, particularly in the areas of energy policy, renewable fuels, greenhouse gases, and climate change.

In addition to his personal professional activities, Dr. Hoekman has provided leadership for DRI in the identification, protection, and licensing of intellectual property (IP) developed at the Institute. Dr. Hoekman was instrumental in establishing a joint Technology Transfer Office (TTO) between DRI and the University of Nevada, Reno (UNR). He currently serves as DRI's Liaison to the TTO, and oversees the activities of this office on behalf of DRI.

Dr. Hoekman has also served DRI by coordinating and promoting the Institution's R&D portfolio in the field of renewable energy. He has led the effort to establish a Renewable Energy Center (REC) at DRI, and continues to provide leadership in this area. For further information about the DRI-REC, please refer to its website at http://www.dri.edu/rec.

In addition, Dr. Hoekman is active in the scientific academic and business communities. He serves as a reviewer for numerous science and engineering journals, is a member of several professional societies, has assisted in organizing scientific conferences, and contributes to the mentoring and advisement of graduate students at the University of Nevada in Reno. Currently, he serves as Associate Editor for the International Journal of Alternative Energy.

From 2001 to 2007, Dr. Hoekman served as Executive Director of DRI's Division of Atmospheric Sciences (DAS). DAS consists of approximately 50 research faculty, along with 70 technologists, graduate students, post-docs, and other support staff. The Division conducts fundamental and applied research around the world on topics pertaining to emissions, renewable energy, air pollution, meteorology, climatology, aerosol chemistry and physics, and other areas related to atmospheric science. DAS also serves as the institutional home for the Western Regional Climate Center, one of six NOAA-funded regional climate centers in the U.S. As Director, Dr. Hoekman was responsible for all personnel, financial, organizational, and professional activities of Divisional operations. The Division's scientific work is sponsored by over 100 federal, state, local, and private organizations that provide approximately $14 million per year in research grants and contracts. For more information about the Division and its activities, please refer to its web site at http://www.das.dri.edu.

Prior to joining DRI in 2001, Dr. Hoekman spent over 20 years at Chevron, where his research focused on transportation fuels and their impacts on motor vehicle emissions and air quality. Experimental work included detailed characterization of exhaust emissions compositions from gasoline-, diesel-, and alcohol-fueled vehicles. Laboratory studies were conducted to investigate how changes in

fuel formulation could reduce vehicle emissions and improve ambient air quality. He has served on several technical committees representing the American Petroleum Institute (API), the Western States Petroleum Association (WSPA), the Coordinating Research Council (CRC), and other industry organizations interested in fuels, emissions, atmospheric chemistry and air quality.

Dr. Hoekman also has experience in environmental regulatory affairs pertaining to vehicles, fuels, emissions, air quality, and health effects. He has served in technical advisory roles to EPA and was a member of the California Air Resources Board (CARB) Research Screening Committee for five years. He served as a member of the Health Effects Institute's (HEI) Special Committee on Emerging Technologies from 2001 through 2007.

Professional Experience

2007 – Present	Research Professor, Division of Atmospheric Sciences, Desert Research Institute, Reno, NV
2001 – 2007	Executive Director, Division of Atmospheric Sciences, Desert Research Institute, Reno and Las Vegas, NV
1997 – 2001	Senior Staff Scientist, Chevron Products Co., San Francisco and San Ramon, CA
1990 – 1996	Staff Scientist and Senior Staff Scientist, Chevron Research and Technology Company, Richmond, CA
1980 – 1989	Research Chemist and Senior Research Chemist, Chevron Research and Technology Company, Richmond, CA

Professional Memberships

- American Association for the Advancement of Science (AAAS)
- American Chemical Society (ACS)
- Air and Waste Management Association (AWMA)
- Society of Automotive Engineers (SAE)
- Algal Biomass Organization

Awards/Honors

- Chevron Chairman's Award (1984) – Presented in recognition of diesel emissions research
- Horning Memorial Award (1985) – Presented by the Society of Automotive Engineers
- Arch T. Colwell Merit Award (1985) – Presented by the Society of Automotive Engineers
- Society of Automotive Engineer's Award for Excellence in Oral Presentation (1993 and 1995)
- Recognition of Appreciation from the California Air Resources Board (2001)

Peer-Reviewed Publications

Broch, A., S.K. Hoekman, S. Unnasch, 2013: A review of variability in indirect land use change assessment and modeling in biofuel policy. Environ. Sci. & Policy, 29, 147-157.

Hoekman, S.K., A. Broch, C. Robbins, B. Zielinska, and L. Felix, 2013: Hydrothermal carbonization (HTC) of selected woody and herbaceous biomass feedstocks. *Biomass Conversion and Biorefinery*, doi:10.1007/s133990-012-0066-y.

Liu, Z., A. Quek, S.K. Hoekman, and R. Balasubramanian, 2013: Production of solid biochar fuel from waste biomass by hydrothermal carbonization. *Fuel* **103**, 943-949.

Parshetti, G.K., S.K. Hoekman, and R. Balasubramanian, 2013: Chemical, structural and combustion characteristics of carbonaceous products obtained by hydrothermal carbonization of palm empty fruit bunches. *Bioresource Technol*, **135,** 683-689.

Reza, M.T., W. Yan, M.H. Uddin, J.G. Lynam, S.K. Hoekman, C.J. Coronella, and V.R. Vasquez, 2013: Reaction kinetics of hydrothermal carbonization of loblolly pine. Bior. Tech., 139, 161-169.

Samburova, V., M.S. Lemos, S. Hiibel, S.K. Hoekman, J. Cushman, and B. Zielinska, 2013: Analysis of triacylglycerols and free fatty acids in algae using ultra-high performance liquid chromatography mass spectrometry. *J. Am. Oil Chem. Soc*., **90**, 53-64.

Liu, Z., A. Quek, S.K.Hoekman, and R. Balasubramania (2012). Thermogravimetric investigation of hydrochar-lignite co-combustion, *Bioresource Technol.*, **123**, 646-652.

Yan, W. and S.K. Hoekman (2012). Dust suppression with glycerin from biodiesel production: a review. *J. Environ. Protection* **3**, 218-224.

Hoekman, S.K. and C. Robbins (2012). Review of the effects of biodiesel on NOx emissions, *Fuel Proc. Technol*. **96**, 237-249. doi:10.1016/j.fuproc.2011.12.036.

Hoekman, S.K., A. Broch, C. Robbins, E. Ceniceros, and M. Natarajan (2012). Review of Biodiesel Composition, Properties, and Specifications. *Renewable and Sustainable Energy Reviews* **16**, 143-169.

Wang, X., C. Robbins, S.K. Hoekman, J.C. Chow, J.G. Watson, and D. Schuetzle (2011). Dilution Sampling and Analysis of Particulate Matter in Biomass-Derived Syngas. *Front. Environ. Sci. Engin. China* **5** (3) 320-330.

Robbins, C., S.K. Hoekman, E. Ceniceros, and M. Natarajan (2011). Effects of Biodiesel Fuels upon Criteria Emissions. *Soc. Auto. Eng. Tech. Paper* No. 2011-01-1943.

Hoekman, S.K., A. Broch, and C. Robbins (2011). Hydrothermal Carbonization (HTC) of Lignocellulosic Biomass. *Energy Fuels* **25** (4) 1802-1810.

Bruins, R., S.K. Hoekman, R. Efroymson, A.Aden, and A. Hecht (2010).Transportation Fuels for the 21st Century. *EM* Nov. 2010, 26-32.

Hoekman, S.K., A. Broch, C. Robbins, and R. Purcell (2009). CO_2 Recycling by Reaction with Renewably-Generated Hydrogen. *International J. of Greenhouse Gas Control* **4**, 44-50.

Hoekman, S.K., A.W. Gertler, A. Broch, C. Robbins, and M. Natarajan (2009). Biodistillate Transportation Fuels 1 – Production and Properties. *Soc. Auto. Eng. Tech. Paper* No. 2009-01-2766.

Robbins, C., S.K. Hoekman, A. Gertler, A. Broch, and M. Natarajan (2009). Biodistillate Transportation Fuels 2 – Emissions Impacts. *Soc. Auto. Eng. Tech. Paper* No. 2009-01-2724.

Broch, A., S.K. Hoekman, A. Gertler, C. Robbins, and M. Natarajan (2009). Biodistillate Transportation Fuels 3 – Life-Cycle Impacts. *Soc. Auto. Eng. Tech. Paper* No. 2009-01-2768.

Hoekman, S.K. (2009). Biofuels in the U.S. – Challenges and Opportunities. *Renewable Energy* **34**, 14-22.

Chow, J.C., S.K. Hoekman, J.M. Norbeck, K.N. Black, R.M. O'Keefe, D.L. Kopinski, M.P. Walsh, J.L. Suchecki, S.L. Altshuler, B. MacClarence, R.A. Harley, and D. Marrack (2001). Diesel Engines: Environmental Impact and Control. *J. Air and Waste Management. Assoc*. **51**, 1258-1270.

Hoekman, S.K., R.S. MacArthur, M. Naylor and J.A. Rutherford (1998). RVP Reduction for Control of Wintertime CO. *Soc. Auto. Eng. Tech. Paper* No. 981373.

Lanning, L.A., W.L. Clark, W.O. Siegl, S.K. Hoekman, R.M. Stanley and W.F. Biller (1997). CRC Hydrocarbon Emissions Analysis Round Robin Test Program, Phase II. *Soc. Auto. Eng. Tech. Paper* No. 971608.

Hoekman, S.K., J. Freel and R.S. MacArthur (1996). Reduced-RVP Gasoline – An Attractive Alternative to RFG. *Soc. Auto. Eng. Tech. Paper* No. 961281.

Hoekman, S.K., R.M. Stanley, W.L. Clark, W.O. Siegl, A.M. Schlenker and W.F. Biller (1995). CRC Speciated Hydrocarbon Emissions Analysis Round Robin Test Program. *Soc. Auto. Eng. Tech. Paper* No. 950780.

Hoekman, S.K. and T.E. Jensen (1993). Methanol Vehicle Emissions Round Robin Test Program. *Soc. Auto. Eng. Tech. Paper* No. 932773.

Hoekman, S.K. (1993). Improved Gas Chromatography Procedure for Speciated Hydrocarbon Measurements of Vehicle Emissions. *J. Chromatog*., **639**, 239-253.

Hoekman, S.K. (1992). Speciated Measurements and Calculated Reactivities of Vehicle Exhaust Emissions from Conventional and Reformulated Gasolines. *Environ. Sci. Technol*. **26**, 1206-1216.

Croes, B.E., S.K. Hoekman and A. Guerrero (1991). Ozone-Forming Potential of Emissions from Lower Aromatic Content Gasolines. *Air and Waste Management Association* Paper No. 91-107.8.

Gething, J.A., S.K. Hoekman, A.R. Guerrero and J.M. Lyons (1990). The Effect of Gasoline Aromatics Content on Exhaust Emissions: A Cooperative Test Program. *Soc. Auto. Eng. Tech. Paper* No. 902073.

Eberhard, G.A., M. Ansari and S.K. Hoekman (1990). Emissions and Fuel Economy Tests of a Methanol Bus with a 1988 DDC Engine. *Soc. Auto. Eng. Tech. Paper* No. 900342.

Beyaert, B.O., S.K. Hoekman, A.J. Jessel, J.S. Welstand, R.D. White and J.E. Woycheese (1989). An Overview of Methanol Fuel Environmental, Health, and Safety Issues. Summer Meeting of American Institute of Chemical Engineers, Philadelphia, PA, August 22, 1989.

Eberhard, G.A., M. Ansari and S.K. Hoekman (1989). Emissions and Fuel Economy Test Results for Methanol- and Diesel-Fueled Buses. *Air and Waste Management Association Paper* 89-9.4.

Horn, J.C. and S. K. Hoekman (1989). Methanol-Fueled Light-Duty Vehicle Exhaust Emissions. *Air and Waste Management Association Paper* No. 89-9.3.

Hoekman, S.K. and M.C. Ingham (1987). Measurement of PAH and Nitro-PAH from a Heavy-Duty Diesel Engine. *Air Pollution Control Association Paper* No. 87-1.4.

Wall, J.C. and S.K. Hoekman (1984). Fuel Composition Effects on Heavy-Duty Diesel Particulate Emissions. *Soc. Auto. Eng. Tech. Paper* No. 841364.

Seizinger, D.E. and S.K. Hoekman (1984). Aromatic Measurements of Diesel Fuel - A CRC Round-Robin Study. *Soc. Auto. Eng. Tech. Paper* No. 841363.

Barton, T.J., Hoekman, S.K., Burns, S.A. (1982). Comments on the Formation of Silanones in the Thermolysis of Hydridosilyl Peroxides. *Organometallics* **1**, 721-725.

Barton, T.J., Hoekman, S.K. (1980). Bis(trimethylsilyl)diazomethane, Trimethylsily trimethylgermyl diazomethane, and Bis(trimethylgermyl)diazomethane – Synthesis and Chemistry of Quantitative Silene and Germene Precursors. *J. Amer. Chem. Soc.* **102**, 1584-1591.

Barton, T.J., Hoekman, S.K. (1979). Convenient Synthesis of Trimethylsilyldiazomethane – Silene Generator. *Synthesis and Reactivity in Inorganic and Metal-Organic Chemistry* **9**, 297-300.

Final Technical Reports

Hoekman, S.K., A. Broch, C. Robbins, R. Jacobson, and R. Turner (2012). "DRI Renewable Energy Center." Final Report submitted to U.S. DOE, Award No. DE-EE0003248, December 2012. (177 pp)

Wells, S.G., Gertler, A.W., and Hoekman, S.K. (2012). "Pre-Treatment of Lignocellulosic Biomass." Final Report of Subtask 1.2 for the Project: Nevada Renewable Energy Consortium, DOE Award No. DE-EE0000272, submitted to U.S. DOE, December 2012. (196 pp)

Hoekman, S.K., A. Broch, C. Robbins, W. Yan, R. Jasoni, P. Verberg, J. Arnone, and T, Minor. (2012) "Developing Thermal Conversion Options for Biorefinery Residues." Final Report to Gas Technology Institute, DOE Contract DE-FG36-01GO11082, November 2012. (119 pp)

Broch, A., and S.K. Hoekman. (2012) "Transportation Fuel Life Cycle Analysis: A Review of Indirect Land Use Change and Agricultural N_2O Emissions." CRC Final Report No. E-88-2, January 2012. (156 pp)

Hoekman, S.K., C. Robbins, and X. Wang. (2011) "Dilution Sampling System for Biomass-Derived Syngas." Final report to DOE under DE-FG30-08CC00057, January 30, 2011. (51 pp)

Hoekman, S.K., A. Broch, C. Robbins, and E. Ceniceros. (2011) "Investigation of Biodiesel Chemistry, Carbon Footprint and Regional Fuel Quality." CRC Final Report No. AVFL-17a, January, 2011. (256 pp)

Hoekman, S.K. (2011) "Thermal Treatment of Biomass." Final Report for Subtask 1.2 of the Nevada Renewable Energy Consortium, January, 2011. (30 pp)

Hoekman, S.K. (2010) "Renewable Energy Center – Desert Research Institute: Phase II." Submitted to NREL, October 13, 2010. (109 pp)

Hoekman, S.K. (2010) DRI-REC-II Task 3A. "Enhance Biofuels/Biomass Testing Capabilities: Sampling and Analysis of Thermal Conversion Products." Submitted to NREL, March 31, 2010. (17 pp)

Hoekman, S.K., C. Robbins, and X. Wang. (2010) "Gridley Biofuels Project Final Report." Submitted to REII, July 21, 2010. (63 pp)

Robbins, C., X. Wang, and S.K. Hoekman. (2010) "Recovery Act: Solar Reforming of Carbon Dioxide to Produce Diesel Fuel." Submitted to REII, October 30, 2010. (24 pp)

Hoekman, S.K., A.W. Gertler, A. Broch, and C. Robbins, (2009) "Investigation of Biodistillates as Potential Blendstocks for Transportation Fuels," CRC Project No. AVFL-17, Report to Coordinating Research Council, June 2009 (289 pages)

Hoekman, S.K. (2008) "DRI-REC Phase I Final Report," submitted to NREL, under Subcontract No. ADO-5-44431-06, July 21, 2008. (18 pages)

Hoekman, S.K., A. Broch, C. Robbins, and R. Purcell. (2008) "Renewable Energy Production via Carbon Capture and Recycling," submitted to RCO2, Nov. 3, 2008. (29 pages)

Reinhardt, R., and S.K. Hoekman. (2007) "Hawaiian Island Gasoline Volatility Study: Analysis of 90th Percentile Maximum Temperature," Submitted to Chevron Products Company, August 3, 2007. (34 pages).

Gertler, A. and S.K. Hoekman (2007) "Review of NAC 590.065: Overview and Implications of Gasoline Volatility Rule Change," Final Report submitted to Nevada Department of Agriculture, February 14, 2007. (60 pages)

Conference papers, proceedings, and presentations

Jena, U., S.K. Hoekman, A. Broch, and C. Robbins, 2013: Hydrothermal Conversion of Biomass into Pelletizable Coal-Like Biofuel: DRI's Experience. Presented at the *Southeast Bioenergy Conference,* Atlanta, GA, February 2013.

Invited Talks

Hoekman, S.K., 2013: Invited talk. Workshop on the "Nexus of Biofuels Energy, Climate Change, and Health" sponsored by the Roundtable on Environmental Health Sciences, Research, and Medicine. Institute of Medicine of the National Academies, Washington D.C., January 24-25, 2013.