BIBLIOGRAPHY OF INTERMEDIATE ETHANOL BLENDS STUDIES

The following reports, papers, and websites relate to Intermediate Ethanol Blend Studies supported or partially supported by the Department of Energy since 2007; also listed are relevant industry-funded materials studies and relevant EPA and Coordinating Research Council websites. Numerous oral presentations were given throughout the program; these are not listed, however those given at DOE Annual Merit Reviews are included here.

Vehicle-Related Studies (Chronological order)

- 1. R. Bechtold, J. F. Thomas, S. P. Huff, J. P. Szybist, T. J. Theiss, B. H. West, M. Goodman, T. A. Timbario, *Technical Issues Associated with the Use of Intermediate Ethanol Blends* (>*E10*) in the U.S. Legacy Fleet: Assessment of Prior Studies, ORNL/TM-2007/37, Oak Ridge National Laboratory, August 2007, available at http://info.ornl.gov/sites/publications/files/Pub7767.pdf.
- 2. Keith Knoll, Brian West, Wendy Clark, Ronald Graves, John Orban, Steve Przesmitzki, Timothy Theiss, *Effects of Intermediate Ethanol Blends on Legacy Vehicles and Small Non-Road Engines, Report 1—Updated*, ORNL/TM-2008/117, February 2009, available at http://info.ornl.gov/sites/publications/Files/Pub12154.pdf
- 3. Knoll, Keith, Brian West, Shean Huff, John Thomas, John Orban, Cynthia Cooper, "Effects of Mid-Level Ethanol Blends on Conventional Vehicle Emissions," SAE Technical Paper 2009-01-2723, 2009, doi:10.4271/2009-01-2723.
- 4. Brent A. Shoffner, Ryan D. Johnson, Martin J. Heimrich, and Michael D. Lochte, *Powertrain Component Inspection from Mid-Level Blends Vehicle Aging Study*, ORNL/TM-2011/65, Prepared by Southwest Research Institute for Oak Ridge National Laboratory, November 2010, available at http://info.ornl.gov/sites/publications/files/Pub28733.pdf.
- 5. C. Scott Sluder and Brian H. West, *NMOG Emissions Characterizations and Estimation for Vehicles Using Ethanol-Blended Fuels*, ORNL/TM-2011/461, Oak Ridge National Laboratory, October 15, 2011, available at http://info.ornl.gov/sites/publications/Files/Pub33272.pdf.
- 6. Sluder, C. and West, B., "Limitations and Recommended Practice In the Use of Compression and Leak-Down Tests to Monitor Gradual Engine Degradation," *SAE Int. J. Engines* 4(3):2767-2777, 2011, doi:10.4271/2011-01-2427.
- 7. Sluder, C. and West, B., "NMOG Emissions Characterizations and Estimation for Vehicles Using Ethanol-Blended Fuels," *SAE Int. J. Fuels Lubr.* 5(2):721-732, 2012, doi:10.4271/2012-01-0883.
- 8. Sluder, C., West, B., and Knoll, K., "Investigating Malfunction Indicator Light Illumination Due to Increased Oxygenate Use in Gasoline," *SAE Int. J. Fuels Lubr.* 5(3):1360-1371, 2012, doi:10.4271/2012-01-2305.
- 9. West, Brian H., Scott Sluder, Keith Knoll, John Orban, Jingyu Feng, *Intermediate Ethanol Blends Catalyst Durability Program*, ORNL/TM-2011/234, February 2012, available at http://info.ornl.gov/sites/publications/Files/Pub31271.pdf
- 10. Vertin, Keith, Gerard Glinksy, and Aaron Reek, *Comparative Emissions Testing of Vehicles Aged on E0, E15, and E20 Fuels*, NREL/SR-5400-55778, August 2012, available at http://www.nrel.gov/docs/fy12osti/55778.pdf
- 11. West, B. and Sluder, C., "Lubricating Oil Consumption on the Standard Road Cycle," SAE Technical Paper 2013-01-0884, 2013, doi:10.4271/2013-01-0884.
- 12. EPA, NREL, and CRC, EPAct/V2/E-89: Assessing the Effect of Five Gasoline Properties on Exhaust Emissions from Light-Duty Vehicles Certified to Tier 2 Standards. Final Report on Program Design

- *and Data Collection*, EPA-420-R-13-004, April 2013, available at http://www.epa.gov/otaq/models/moves/epact.htm
- 13. C. Scott Sluder and Brian H. West, *Preliminary Examination of Ethanol Fuel Effects on EPA's R-factor for Vehicle Fuel Economy*, ORNL/TM-2013/198, Oak Ridge National Laboratory, June 2013.
- 14. Sluder, C., West, B., Butler, A., Mitcham, A. et al., "Determination of the R Factor for Fuel Economy Calculations Using Ethanol-Blended Fuels over Two Test Cycles," *SAE Int. J. Fuels Lubr.* 7(2):551-562, 2014, doi:10.4271/2014-01-1572.
- 15. CRC Reports available at http://crcao.org/news/Mid%20Level%20Ethanol%20program/index.html

Non-Automotive Engines

- 16. Keith Knoll, Brian West, Wendy Clark, Ronald Graves, John Orban, Steve Przesmitzki, Timothy Theiss, *Effects of Intermediate Ethanol Blends on Legacy Vehicles and Small Non-Road Engines, Report 1—Updated*, ORNL/TM-2008/117, February 2009, available at http://info.ornl.gov/sites/publications/Files/Pub12154.pdf (repeated from #2 above, contains vehicle and SNRE data)
- 17. Zooubul, George, Mel Cahoon, and Richard Kolb, *Volvo Penta 4.3 GL E15 Emissions and Durability Test*, NREL/SR-5400-52577, October 2011, available at http://www.nrel.gov/docs/fy12osti/52577.pdf
- 18. Hilbert, David, *High Ethanol Fuel Endurance: A Study of the Effects of Running Gasoline with 15% Ethanol Concentration in Current Production Outboard Four-Stroke Engines and Conventional Two-Stroke Outboard Marine Engines*, NREL/SR-5400-52909, October 2011, available at http://www.nrel.gov/docs/fy12osti/52909.pdf
- 19. Miers, Scott A., Jason R. Blough, *Evaluating the Impact of E15 on Snowmobile Engine Durability and Vehicle Driveability*, NREL/SR-5400-60115, August 2013, available at www.nrel.gov/docs/fy13osti/60115.pdf

Materials and Infrastructure

- 20. Boyce, Kenneth, J. Thomas Chapin, *Dispensing Equipment Testing With Mid-Level Ethanol/Gasoline Test Fluid: Summary Report*, Underwriters Laboratories, Inc. report, November 2010, available at http://www.nrel.gov/docs/fy11osti/49187.pdf
- 21. M. D. Kass, T. J Theiss, C. J. Janke. S. J Pawel, and S. A. Lewis, Sr., *Intermediate Ethanol Blends Infrastructure Materials Compatibility Study: Elastomers, Metals, and Sealants*, ORNL/TM-2010/326, March 2011, available at http://info.ornl.gov/sites/publications/files/Pub27766.pdf
- 22. M. D. Kass, T. J Theiss, C. J. Janke. and S. J Pawel, *Compatibility Study for Plastic, Elastomeric, and Metallic Fueling Infrastructure Materials Exposed to Aggressive Formulations of Ethanol-blended Gasoline*, ORNL/TM-2012/88, July 2012 available at http://info.ornl.gov/sites/publications/Files/Pub35074.pdf
- 23. M. D. Kass, T. J Theiss, C. J. Janke. and S. J Pawel, *Analysis of Underground Storage Tanks System Materials to Increased Leak Potential Associated with E15 Fuel*, ORNL/TM-2012/182, July 2012 (Report for USEPA Office of Underground Storage Tanks) available at http://info.ornl.gov/sites/publications/Files/Pub36356.pdf
- 24. M. D. Kass, T. J Theiss, C. J. Janke. S. J Pawel, J. T. Chapin, T. Fabian, K. Boyce and E. Yang, "Elastomer Compatibility to Gasoline Containing Intermediate Levels of Ethanol," Sealing Technology, December 2012, pgs. 7-12
- 25. M. D. Kass, C. J. Janke, S. J. Pawel, J. K. Thomson, H. Meyer, and T. J. Theiss, *Compatibility Study for Plastic, Elastomeric, and Metallic Fueling Infrastructure Materials Exposed to Aggressive*

- Formulations of Isobutanol-blended Gasoline, ORNL/TM-2013/243, August 2013 available at at http://info.ornl.gov/sites/publications/Files/Pub44488.pdf
- 26. Kass, M., Theiss, T., Pawel, S., Baustian, J. et al., "Compatibility Assessment of Elastomer Materials to Test Fuels Representing Gasoline Blends Containing Ethanol and Isobutanol," *SAE Int. J. Fuels Lubr.* 7(2):445-456, 2014, doi:10.4271/2014-01-1462
- 27. Kass, M., Janke, C., Theiss, T., Pawel, S. et al., "Compatibility Assessment of Plastic Infrastructure Materials to Test Fuels Representing Gasoline Blends Containing Ethanol and Isobutanol," *SAE Int. J. Fuels Lubr.* 7(2):457-470, 2014, doi:10.4271/2014-01-1465
- 28. EPA website on ethanol compatibility: http://www.epa.gov/oust/altfuels/ethcompat.htm

DOE Merit Review Presentations

- 29. Steve Przesmitzki and Brian West, "Mid-Level Ethanol Blends Test Program," presented at the 2009 U.S. DOE Biomass Program Infrastructure Peer Review, March 19, 2009, available at http://www.obpreview2009.govtools.us/infrastructure/documents/NREL_ORNL_OBP_Infrastructure_Review_2009_03_17_bw_sp_final.pdf
- 30. Keith Knoll, et al., "Mid-Level Ethanol Blends Test Program," presented at the 2009 U.S. DOE Hydrogen Program and Vehicle Technologies Program Annual Merit Review and Peer Evaluation Meeting, May 19, 2009, available at http://www1.eere.energy.gov/vehiclesandfuels/pdfs/merit_review_2009/fuel_technologies/ft_05_knol_l.pdf
- 31. Brian West, et al., "Mid-Level Ethanol Blends Test Program," presented at the 2010 U.S. DOE Hydrogen Program and Vehicle Technologies Program Annual Merit Review and Peer Evaluation Meeting, June 9, 2010, available at http://www1.eere.energy.gov/vehiclesandfuels/pdfs/merit_review_2010/fuel_technologies/ft005_west_2010_o.pdf.
- 32. Brian West, et al., "Intermediate Ethanol Blends Testing Program Overview and Vehicle Testing," presented at the 2011 U.S. DOE Biomass Infrastructure Review Meeting, February 2011, available at http://obpreview2011.govtools.us/presenters/public/AllPresentations.aspx
- 33. Tim Theiss, et al., "Preliminary Results from the ORNL Infrastructure Materials Compatibility Study" presented at the 2011 U.S. DOE Biomass Infrastructure Review Meeting, February 2011, available at http://obpreview2011.govtools.us/presenters/public/AllPresentations.aspx
- 34. Kristi Moriarty and Wendy Clark, "NREL UL Fuel Dispensing Infrastructure Intermediate Blends Performance Testing" presented at the 2011 U.S. DOE Biomass Infrastructure Review Meeting, February 2011, available at http://obpreview2011.govtools.us/presenters/public/AllPresentations.aspx

EPA E15 Rulings (Federal Register)

- 35. Federal Register, Vol. 75(213), Thursday, November 4, 2010, Notices.
- 36. Federal Register, Vol. 76(17), Wednesday, January 26, 2011, Notices.