

Biodiesel from the Right Sources Can Burn More Cleanly than Regular Diesel

Emissions Depend on Both Biodiesel Feedstock (Source) and Combustion Conditions

San José, Calif., August 24, 2016 — The [Mineta National Transit Research Consortium](#) at San José State University recently released a study on the generation of various pollutants during low-temperature combustion (LTC) of several types of biodiesel in comparison to ultra-low sulfur diesel (ULSD). The results of the peer-reviewed report [Experimental Modeling of NO_x and PM Generation from Combustion of Various Biodiesel Blends for Urban Transport Buses](#) showed that certain sources (feedstocks) of biodiesel produced less pollution than others under certain combustion conditions. In addition to being a renewable energy source for the transportation sector and reducing exhaust emissions, biodiesel may have the advantage of reducing the size and number of soot particles emitted. The resultant recommendation is that energy policies and environmental regulations leverage the proper choice of biodiesel feedstocks and blending ratios to optimize combustion efficiency and environmental sustainability.

The study focused on generation of nitrogen oxides (NO_x), particulate matter (PM) and carbon emissions from LTC of different grades of biodiesel (B0, B20, B50, and B100) from three different feedstocks: soybean methyl ester (SME), tallow oil (TO), and waste cooking oil (WCO). Biodiesel containing more unsaturated fatty acids emitted higher levels of NO_x than the biodiesel with more saturated fatty acids. Thus, biodiesel with fewer unsaturated fatty acid methyl esters (FAMES) such as TO and WCO would be preferable when reduction of NO_x emissions is desired. The performance of a bus that ran on blended biodiesel (B5) was found to be very similar to that of one that ran on ULSD, and drivability was not an issue with blended biodiesel.

Principal investigator Dr. Ashok Kuma notes that “Biodiesel is being industrialized as one of the potential sources of sustainable energy for transportation in the future. This study provides additional justification for the use of biodiesel as an alternative fuel compared to regular diesel.” It is recommended that governments consider using particular blends of biodiesel in urban and commercial vehicles to enhance the quality of air and to promote healthy living. Meanwhile, agriculture departments should publish guidelines for farmers for growing environmentally friendly biodiesel feedstock.

The full report can be downloaded at no charge from the Mineta National Transit Research Consortium website: <http://transweb.sjsu.edu/project/1245.html>

ABOUT THE RESEARCH TEAM

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ABOUT THE MINETA NATIONAL TRANSIT RESEARCH CONSORTIUM

The Mineta National Transit Research Consortium (MNTRC) is composed of nine university transportation centers led by the Mineta Transportation Institute at San José State University. The Consortium was organized in January 2012 after winning a competition sponsored by the US Department of Transportation (DOT) to create consortia tasked with “Delivering Solutions that Improve Public Transportation.” Member universities include Bowling Green State University, Grand Valley State University, Howard University, Penn State, Rutgers University, San José State University, University of Detroit Mercy, University of Nevada Las Vegas, and University of Toledo. Visit transweb.sjsu.edu/mntrc

ABOUT THE MINETA TRANSPORTATION INSTITUTE

The Mineta Transportation Institute (MTI) conducts research, education, and information transfer programs regarding surface transportation policy and management issues, especially related to transit. Congress established MTI in 1991 as part of the Intermodal Surface Transportation Efficiency Act. MTI won national re-designation competitions in 2002, 2006 and 2012. The Institute is funded through the US Department of Transportation, the US Department of Homeland Security, the California Department of Transportation, and public and private grants. The internationally respected members of the MTI Board of Trustees represent all major surface transportation modes. MTI, the lead institute for the nine-university Mineta National Transit Research Consortium, is affiliated with San José (CA) State University’s Lucas College and Graduate School of Business. Visit transweb.sjsu.edu

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