Petrochemistry-2013

OMICS Group Conferences
Accelerating Scientific Discovery

World Congress on
Petrochemistry and Chemical Engineering

November 18-20, 2013 Hilton San Antonio Airport, USA

Emission characteristics of CI engine running with biodiesel

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Abstract

Biodiesel is one of the alternative fuels which is renewable and environmentally friendly and can be used in diesel engines with little or no modifications. In the present study, experimental investigations were carried out on the effects of biodiesel types and biodiesel fraction on the emission characteristics of a compression ignition (CI) engine. The experimental work was conducted on a four-cylinder, four -stroke, direct injection (DI) and turbocharged diesel engine by using biodiesel of waste oil, rapeseed oil and corn oil and normal diesel. The fuels used in the analyses are B20, B50, B100 and neat diesel. The engine was running for range of engine speeds and loads. Based on the measured parameters, detailed analyses were carried out on major emission such as NOx, CO, CO_2, and THC. It has been seen that the biodiesel types (sources) do result in any significant differences in emission. The results also clearly indicate that the engine running with biodiesel and blends have higher NOx emission up to 20%. However, the emissions of CI engine running on biodiesel were reduced up to 15%, 40% and 30% for CO, CO_2 and THC emissions respectively as compared to diesel fuel at main operating conditions.

Biography

Dr Belachew Tesfa is a researcher at the University of Huddersfield, UK. He was awarded a PhD in 2011 from the University of Huddersfield in the research area Performance and Emission Characteristics of CI Engine Fuelled with Biodiesel during Transient Condition. Dr Tesfa has published more than 25 papers in international conference proceedings and prestigious journals such as Energy, Renewable Energy, Energy Conversation and Managements and Journal of Physics etc. Dr Tesfa is currently actively working on alternative fuel, energy, emission reduction techniques, emission models and condition monitoring system of car tire and suspension. He is a member of Institute of Mechanical Engineers (IMechE) and he is a charted engineer (CEng).