



Performance and Emission Characteristics of a Diesel Engine using Blends of Biodiesel by varying Saturated Fatty acid Compositions

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Abstract : This work discusses about blends of vegetable oil esters with varying saturated fatty acid composition which were used to conduct the performance and emission tests on a stationary C.I.Engine. Saturated fatty acids are long-chain carboxylic acids that usually have between 8 and 24 carbon atoms and have no double bonds. The unsaturated fatty acids are similar to saturated fatty acids, excluding that the chain has double bonds. Biodiesels were made from pongamia, palm, coconut, mahua, neem, cottonseed and Jatropha with saturated fatty acid composition as 55%, 65% and 75% respectively. The biodiesels has lauric acid, myristic acid, palmitic acid, linoleic acid, linolenic acid, stearic acid and oleic acid in varying proportions. The experimental results support that biodiesel having high-saturated fatty acid composition can be used as a fuel in a CI engine without compromising on thermal efficiency. The NO_x and hydrocarbon emission reduces with increase in saturation percentage in biodiesel while smoke emissions are increased. Biodiesels with high saturated fatty acid composition has higher cetane number, density and viscosity. Ignition delay and NO_x emissions reduces with increase in cetane number.

Keywords: Saturated fatty acid, cetane number, thermal efficiency, combustion, ignition delay.