International J. of Engg. Research & Indu. Appls. (IJERIA).
ISSN 0974-1518, Vol.6, No. III (August 2013), pp 229-247

A REVIEW ON BIODIESEL AS AN ALTERNATIVE FUEL

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Abstract

The increasing industrialization and motorization of the world has augmented the demand of petroleum based fuels. Only limited reserves are available for petroleum based fuels. These finite reserves are highly concentrated in certain regions of the world. Hence it is necessary to look for alternative fuels which can be produced from resources such as alcohol, biodiesel, vegetable oil, etc. Biodiesel is an alternative fuel for diesel that is produced from vegetable oil and animal fats. It consists of the monoalkyl esters formed by a catalyzed reaction of the triglycerides in the oil or fat with a simple monohydric alcohol. The reaction conditions generally involve a trade off between reaction time and temperature as reaction completeness is the most critical fuel quality parameter. Most of the process complexity originates from contaminants in the feedstock such as water and free fatty acids or impurities in the final product such as methanol, free glycerol and soap. Processes have been developed to produce biodiesel from high free fatty acid feedstocks such as recycled restaurant grease, animal fats and soap stocks. More than 350 oil- bearing crops have been identified, out of which only a few were considered as potential alternative fuels for diesel engines. It was reported that the combustion characteristics of biodiesel are similar to diesel and its blends were found to have a shorter ignition delay, higher ignition temperature, higher ignition pressure and peak heat release. The engine power output was found to be that of diesel. This paper attempts to review the production, combustion, performance and emissions of biodiesel collected from previous research work recently published in journals, proceedings or other references involved.

Keywords: Biodiesel, diesel engine, combustion, performance and emission.