

Effect of biodiesel fuels on diesel engine emissions

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Abstract

Energy production is heavily dependent on fossil fuels that are not only diminishing, but also are considered the main cause of harmful emissions and global warming. Therefore using vegetable oils such as Jatropha, palm, algae and waste cooking oils as alternative fuels in diesel engines has drawn a great attention. Biodiesel from Jatropha, palm, algae and waste cooking oils has been produced using the transesterification process. Biodiesel from different feedstock is mixed with diesel oil in different proportions e.g. B10 and B20. Biodiesel physical and chemical properties are measured according to ASTM standards. A “single cylinder diesel engine” is employed as the test engine in the present work. Exhaust emissions such as CO, CO₂, NO_x, HC, and smoke are measured and compared with diesel oil. CO, HC, CO₂ and smoke emissions are lower for biodiesel mixtures B10 and B20 (Jatropha, algae and palm) compared “to diesel fuel”. CO₂ emissions from biodiesel blends B10 and B20 produced from waste cooking oil are higher compared to diesel fuel. NO_x emissions from all biodiesel mixtures B10 and B20 increases than diesel fuel for all biodiesel blend B10 and B20.