

The Investigation of CNG Dual-Biodiesel fuel Approach to Address the Performance - Emission Assisted Multipurpose Diesel Engine

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Abstract

Diesel engines can operate on a variety of the different fuels such as diesel fuel derived from crude oil, natural gas and biodiesel. Nowadays, the price of compress natural gas (CNG) and biodiesel is cheaper than diesel fuel since it is a potential advantage to use a combined CNG and biodiesel for multipurpose diesel engine. The aims of this work were to investigate the efficiency and emission from the multipurpose diesel engine. In the experiments, the fuel used in a combustion chamber was diesel, biodiesel derived from waste cooking oil (B100) and combined B100 and CNG. Effect of the various ratios of CNG (10, 20 and 30%), engine load (25, 50 and 75%) and exhaust gas recirculation (EGR: 0, 10 and 20%) were also investigated. Based on these experiments, the brake thermal efficiency decreased with an increase in CNG ratio. However, the brake thermal efficiency increased with an increase in the engine load. When the CNG ratio in a combustion chamber increased, the hydrocarbon concentration and Smoke number (SN) increased whereas the nitrogen oxide decreased. In term of exhaust gas recirculation (EGR), the use of EGR was not significant effect to brake thermal efficiency for various fuels. However, the increasing of EGR and CNG ratio led to an increase in hydrocarbon, carbon monoxide and Bosch smoke number. It should be noted that the nitrogen oxide decreased with an increase in EGR and CNG ratio.

Keywords : Biodiesel, Compressed Natural Gas, Emission, Multipurpose diesel engine

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