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IS THE ETHANOL ADDITIVE MORE ENVIRONMENTALLY FRIENDLY FOR A SPARK IGNITION (SI) ENGINE OR FOR A COMPRESSION IGNITION (CI) ENGINE?

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Abstract

Clearly, the purpose of this paper is to find an answer to the following question "*Is the ethanol additive more environmentally friendly for an SI engine or for a CI engine?*". The tests, therefore, were conducted on both an SI and a CI engine for the same parameters under both same conditions and laboratory. Ethanol was blended into neat diesel (D100) and neat gasoline (G100) at the same proportion (10 vol. %) and two blends were prepared in the study, namely D90E10 and G90E10, respectively. Then the tests were conducted on different engine speeds varying from 2250 to 3250 rpm with an interval of 250 rpm. In the experimental results achieved in the study, the most reductions among exhaust emissions, as compared to reference-D100 and reference-G100 fuel type, were achieved in HC and CO emissions with the presence of ethanol. With the addition of ethanol, HC and CO emissions in the SI engine reduced by 47.9% and 47.0%, respectively; on the other hand, these emissions also reduced by 28.5% and 25.1%, respectively in CI engine. An interesting result from this paper is that NOx emission was slightly reduced by 2.3% for SI engine with the addition of ethanol, whilst it is observed an increase of approximately 40% for the CI engine. This study showed that the addition of ethanol can be used in both SI and CI engines without any modification and can result in a significant reduction in exhaust emissions. In conclusion, this paper is distinctly reporting that the presence of ethanol into diesel fuel has presented better results than those of gasoline fuel in terms of exhaust emissions.

Key words: diesel, ethanol, emission, gasoline, pollutant, greenhouse gas

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