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PERFORMANCE AND EMISSION CHARACTERISTICS OF SOLKETAL-GASOLINE FUEL BLEND IN A VEHICLE WITH SPARK IGNITION ENGINE

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Abstract

Glycerol is a major byproduct of biodiesel production and it is used in many areas of application such as solketal production. Solketal is an alternative fuel for gasoline engines. Solketal addition into gasoline provides better fuel characteristics and especially an increase in octane number. In this study, detailed fuel properties of solketal-gasoline fuels were characterized according to fuel standards specified in EN 228. Pure gasoline and the blend containing 9% solketal were used as test fuels. Engine performance and emission characteristics of a vehicle with spark ignition engine were determined by using a chassis dynamometer. According to the test results, octane number and density of the blend increased while gum formation decreased when using solketal as an additive with gasoline fuel. Brake specific fuel consumptions of the solketal blend were higher than those of pure gasoline for all test conditions. Emission results showed that CO and HC emissions decreased while CO₂ and NO_x emissions increased generally compared to pure gasoline when the engine was fueled with the solketal blend.

Keywords: Solketal, Gasoline, Alternative Fuels, Performance, Emission

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