Analysis of Fossil Fuel Mixture with Orange Peel Bioethanol on Injection Engine Performance and Exhaust Gas Emissions

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ABSTRACT

Orange peel contains large amounts of minerals (calcium, selenium, manganese, and zinc) and vitamins (C, A, and B complex) several times more than the pulp. Orange peel has a high carbohydrate value, potentially can be used as an alternative material, one of which is the use of bioethanol. The purpose of this study was to determine the impact of adding bioethanol to Pertalite fuel on engine performance and vehicle exhaust emissions using 3 variations, namely 100% Pure Pertalite + 0% Orange Peel Bioethanol, 95% Pure Pertalite + 5% Orange Peel Bioethanol, 90% Pure Pertalite + 10% Orange Peel Bioethanol. The results of the study showed that the addition of bioethanol to fuel can improve vehicle performance, but the addition of excessive bioethanol to fuel can actually reduce engine performance. At 6000 rpm, the highest torque value is 8.40 Nm and 7.54 Hp. The addition of orange peel bioethanol to vehicle exhaust emissions, the results of testing bioethanol samples on exhaust emissions of Carbon Monoxide (CO) and Hydrocarbons (HC) at idle engine speed did not exceed the threshold set by the Regulation of the Minister of State for the Environment No. 05 of 2006.

Keywords: *Bioethanol, Orange Peel, Engine Performance, Exhaust Emissions*