

VISVESVARAYA TECHNOLOGICAL UNIVERSITY



**PROJECT REPORT
ON
“EXPERIMENTAL INVESTIGATION AND NUMERICAL
ANALYSIS OF HYDROGEN INDUCTION TO CI ENGINE
WORKING ON JATROPHA BIODIESEL BLENDS”**

A dissertation submitted to the
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In partial fulfilment of the requisites for the
Award of the degree of

**MASTER OF TECHNOLOGY
IN
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ABSTRACT

The price of crude oil is increasing annually due to the depletion of hydrocarbon production. In order to cope with the high demand from the market, researchers are working on improving the performance of the fuels by applying fuel oxygenates. Fuel oxygenates are chemical compounds that has the function of increasing the oxygen content in the fuel. The presence of fuel oxygenates promotes more complete combustion and hence, better engine performance and fuel consumption can be achieved. Besides, better combustion process also lowers the emission of harmful gases. In this research, the main objective is to determine the effects of applying hydrogen based additives as diesel oxygenates. Due to the difference in polarity, the blending of hydrogen based additives and bio-diesel fuel mixtures require emulsification process to achieve a stable mixture. After emulsification, stability test was conducted on the oxygenated diesel samples based on the separating layer. Characterization tests were then carried out to identify the effects of hydrogen induction application. The major parameters of the oxygenated bio-diesel blends are cetane number, calorific value, oxygen and sulphur content. From the analysis of the characterization tests, the application of hydrogen based additives increases the oxygen content of the diesel .The presence of additional oxygen improves the combustion quality and simultaneously reduces the emission of harmful gases, such as carbon monoxide and sulphur dioxide by increasing the cetane number.

Keywords: Hydrogen, Biodiesel,