VISVESVARAYA TECHNOLOGICAL UNIVERSITY

BELGAUM

A project report on

"A Simple Method For Faster Bio-diesel Production "

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ABSTRACT

A Simple Method for Faster Bio-diesel Production

Background: Energy is an essential requirement for economic and social development of any country. The world energy demand for the last two decades, witnessed uncertainties in two dimensions. Firstly, depletion of fossil fuels. Secondly, combustion of fossil fuels, main culprit in increasing the global carbon dioxide level which adds to global warming. Economic, environmental and energy security concerns resulting from excessive reliance on petroleum are forcing countries the world over to shift to alternatives like biofuels in the form of ethanol and biodiesel. The rapid depletion of fossil fuel with increased environmental concern has stimulated worldwide efforts to produce alternative to diesel. Use of bio-origin fuel as an alternative fuel can contribute significantly towards the twin problem of fuel crises and environmental pollution. The fuel of bio-origin may be the biodiesel obtained from edible or non-edible vegetable oil through transesterification process. Most of the properties of biodiesel compare favorably with the characteristics required for CI fuel.

This fuel in the form of blend with diesel performs almost as well as neat diesel fuel with little or no engine modification. Honge oil is non-edible vegetable oil. In the present investigation the blends of varying proportions of Honge Oil Methyl Ester (HOME) and diesel were used to run a double cylinder CI engine and significant improvements in engine performance and emission characteristics were observed. The thermal efficiency of the engine was improved, and emission of smoke was decreased.

When biodiesels started performing successfully in diesel engines, it was very much necessary to accelerate the rate of production of biodiesel keeping in mind that the their yields should not be sacrificed. In the conventional method of production of biodiesel heat source required for the reaction to take place, is from ordinary coil heater and sensible heat is added to the reactant. Where as the method which we have used for faster biodiesel production utilizes domestic microwave oven as the heating source due to which the reaction time and settling time got reduced by a significant value, at the same time yield was increased.

Results. In conventional method of biodiesel production, it was noted that it took near about **90 minutes** for reaction itself and took another **3 hours** for the product to settle down.

Where as when the same experiment was carried out in a microwave assisted reaction setup, it hardly took **2 minutes** for the reaction to complete where as the settling time went for the maximum of **30 minutes**. On the part of conversion efficiency of both these processes, for the conventional process it was between **50% - 70%** where as for the new method it went up to **85% - 90%**

Conclusions: Based on the above experimental results, it is clearly seen that if we go with the new method using microwave then we can easily get the biodiesel in less than 2 min. at the same time this process results in higher conversion efficiency. Based on the reaction time taken, the new method is nearly 45 times efficient than that of conventional method.