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Effect of catalyst coated piston and antioxidant additive on decrease in pollutants in diesel engine using neat biodiesels (B100)

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Abstract

The present work aims at to analysis the impact of ZrO_2 and L ascorbic acid (200mg) (LA200) on working behaviors in (B100) operated diesel engine. These are nerium, mahua and calophyllum. From the tests, the ZrO_2 with LA200 in B100 of nerium fueled diesel engine showed better brake thermal efficiency (BTE), brake specific fuel consumption (BSFC) and reduction in pollutants such as monoxide of carbon (CO), hydrocarbon (HC), oxides of nitrogen (NO_x) and smoke than diesel and B100 of other biodiesels.

Key words: B100, ZrO_2, LA200, diesel engine, pollutants, BTE.

1. Introduction

The vegetable methyl ester can be used as alternative for petroleum derive fuels inn diesel engine [1]. The biodiesel in diesel engine showed reduction in pollutants except NO_x than diesel. There is slight power loss of about 2.8% at full load for apricot biodiesel (B100) with respect to diesel. Also there is a maximum increase of brake specific energy consumption (BSEC) of about 4.8% is observed for B100. Further, the reduction in pollutants with slight increase in NO_x was achieved [3]. The biodiesel shows the higher NO_x than diesel [4]. The HC of camelina biodiesel (B100) is 68.8% lesser, while the NO_x is 58.8% higher than diesel. Further, the BSFC increases to a maximum of 56.25% for B100 [5]. The biodiesel concentration is increased from diesel to B20 and also from B20 to B100 increases the NO_x[6]. Among the four biodiesels, calophyllum possesses higher calorific value, which is much closer to that of diesel. Further, it has been found that NO_x is increasing for all biodiesels [7]. Among different proportions of waste biodiesel, B100 showed maximum emission of NO_x and particulate matter