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KARNATAKA STATE COUNCIL FOR SCIENCE AND TECHNOLOGY

Indian Institute of Science Campus, Bengaluru – 560 012

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STUDENT PROJECTS PROGRAMME - BIOFUEL PROJECTS:41st SERIES – STATE LEVEL SEMINAR AND EXHIBITION

List of Projects Selected for State Level Seminar and Exhibition (S&E) to be held at Bapuji Institute of Engineering and Technology, Davanagere on 10th and 11th August 2018

25. SAPTHAGIRI COLLEGE OF ENGINEERING, BENGALURU

Sl. No.	PROJECT REFERENCE NO.	PROJECT TITLE	BRANCH	NAME OF THE GUIDE	STUDENT 1 & TEAM LEADER	STUDENT 2	STUDENT 3	STUDENT 4	PROJECT SELECTED FOR
34.	41S_B_BE_062	INVESTIGATIONS ON PERFORMANCE AND POLLUTION LEVEL ON N-BUTANOL BLENDED PETROL FUELED IC ENGINE (10% TO 50% BLENDING)	MECHANICAL ENGINEERING	Prof. RAGHUTHAMA RAO	Mr. CHETAN R	Mr. C R ABHIRAM	Mr. KARAN N	Mr. KALOLA NEIL PRAVINBHAI	SEMINAR
35.	41S_B_BE_076	DESIGN AND LAB SCALE ULTRASOUND BATCH REACTOR FOR THE PRODUCTION OF BIODIESEL FROM THE SLAUGHTER WASTE.	BIOTECHNOLOGY	Prof. KAVYA M. V.	Ms. NIRANJANA S.	Ms. VANI VISWANATHAN	-	-	SEMINAR

Note:

- You are requested to send the hard bound copy of the project report along with softcopy of the full report in a CD in PDF format.
- Any corrections with respect to Guide and Students name, kindly send an email regarding the same to biofuelcell.kscst@gmail.com.

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Scope for future work:

1. By varying different blends and volume of nano particles can be tested.
2. Testing can be done on 4-cylinder engine to understand the emission and performance characteristics better.

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INVESTIGATIONS ON PERFORMANCE AND POLLUTION LEVEL ON N-BUTANOL BLENDED PETROL FUELED IC ENGINE (10% TO 50% BLENDING)

Project Reference No.: 41S_B_BE_062

COLLEGE : SAPTHAGIRI COLLEGE OF ENGINEERING, BENGALURU
BRANCH : DEPARTMENT OF MECHANICAL ENGINEERING
GUIDE : Prof. RAGHUTHAMA RAO
STUDENTS : Mr. CHETAN R
Mr. C R ABHIRAM
Mr. KARAN N
Mr. KALOLA NEIL PRAVINBHAI

ABSTRACT: N-Butanol or *n*-butyl alcohol is a primary alcohol with a 4-carbon structure and the chemical formula C_4H_9OH. Now-a-days air pollution is becoming a serious problem in many urban cities and it can have a serious effect on the environment. Although experimental studies have shown that alcohol fuels burn cleaner than gasoline and produce lesser emission there is scarce information regarding the comparison among the alcohol fuels as gasoline additive in spark-ignited engines. Experimental investigations are planned both on performance and pollution levels of exhaust gas emissions. N-butanol is to be added to unleaded gasoline by mass percent of 10% to 50% and then will be tested in a four stroke SI engine.

OBJECTIVES:

1. To reduce atmospheric pollution by decreasing emission levels of petrol engines by using n-butanol blended petrol.
2. To study the reduction in emissions of butanol blended fuel (Studying pollutant elements such as CO, CO2, NOX, HC).
3. To test the performance of petrol engines by the use of n-butanol blended petrol with various parameters, to reduce the consumption of petrol and to find alternatives for depleting fossil fuel reserves.

METHODOLOGY FOR EXECUTING THE PROJECT: Purchasing and refurbishing a petrol engine and to fix it rigidly on a base frame and set up a prony brake dynamometer to test its performance. Next prepare blended fuel of petrol with n-butanol using a centrifuge from 10% to 50% blends in steps of 10% and conduct the performance test of petrol engine using blended petrol fuel in comparison with unblended petrol fuel and check the emission levels of the exhaust gases when different blends of n-butanol with petrol in comparison with unblended petrol fuel and evaluate optimum blending levels.

EXPECTED OUTCOME OF THE PROJECT: Study the performance of petrol engine with the use of n-butanol blended petrol fuel. Reduced emission of pollutants in exhaust gases by the use of n-butanol blended petrol fuel. A comparative study of the changes in performance of the engine is run on butanol blended petrol and unblended petrol. Changes in performance parameters and pollution levels compared to 100% petrol fuelled engine.

WORK CARRIED OUT: For evaluation of exhaust and performance characteristics N-Butanol blends up to 50% ratios in 10% increments N10, N20, N30, N40 and N50 are prepared in bio technology department laboratory. 200ml of each blend was prepared and then the engine was run on petrol until it ran stable. After that the performance of the engine i,e. brake power, brake specific fuel consumption (bsfc), brake thermal efficiency, brake mean effective pressure were evaluated. The engine was tested at a constant speed of 420 rpm with varying loads from 0 kg with steps of 2 kg up to 10 kg. The engine was loaded using a rope brake dynamometer setup. Emission characteristics test for the engine with all Blends was done in a government certified test center for biofuel research in Vemana Institute of Technology using an "Automotive Emission Analyzer (QRO-401 Series)" and CO, CO2, HC, O2 and NOx levels were determined.

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VISVESVARAYA TECHNOLOGICAL UNIVERSITY
BELAGAVI, KARNATAKA, INDIA

A PROJECT REPORT
ON

INVESTIGATIONS ON PERFORMANCE AND POLLUTION LEVELS ON N-BUTANOL BLENDED PETROL FUELED ENGINE (10% TO 50% BLENDING)

A report submitted in the partial fulfillment of the requirements for the award of the degree of

Bachelor of Engineering

in

Mechanical Engineering

Submitted by

CHETAN R	1SG14ME026
C R ABHIRAM	1SG14ME021
KALOLA NEIL PRAVINBHAI	1SG14ME044
KARAN N	1SG14ME046

Under the guidance of

Mr. P Raghuthama Rao
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DEPARTMENT OF MECHANICAL ENGINEERING
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2017-18

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[AFFILIATED TO VIVSVESWARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI]

Department of Mechanical Engineering

SAPTHAGIRI
College of Engineering

CERTIFICATE

Certified that the project work entitled **INVESTIGATIONS ON PERFORMANCE AND POLLUTION LEVELS ON N-BUTANOL BLENDED PETROL FUELED ENGINE (10% TO 50% BLENDING)** carried out by **CHETAN R(1SG14ME026), C R ABHIRAM(1SG14ME021), KALOLA NEIL PRAVINBHAI(1SG14ME044) and KARAN N(1SG14ME046),** bonafide students of 8th semester, department of **Mechanilcal Engineering** carried out at our college **Sapthagiri College of Engineering,** Bengaluru in partial fulfillment of the award of **Bachelor of Engineering** in **Mechanical Engineering** of the **Visvesvaraya Technological University,** Belagavi during the year 2017-18. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the Report deposited in the departmental library. The project report has been approved as it satisfies the academic requirements in respect of Project work prescribed for the said Degree.

11.6.2018	11/6/18	11/6/18
Prof Raghuthama Rao Associate Professor **Signature of the Guide**	Dr. P Mahadevaswamy Head of the Dept. **Signature of the HOD**	Dr. K L Shivabasappa Principal **Signature of the Principal**

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External Viva

Name of the Examiners	**Signature of the Examiners with date**
1. Dr. Mahadevaswamy P	1. 12.6.18
2. S R GOVINDASWAMY A	2. 12.6.18