



Karnataka State Council for Science and Technology

Indian Institute of Science Campus, Bengaluru - 560 012

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Dr. S. G. Sreekanteswara Swamy
Executive Secretary

31st March, 2017

Ref: 7.1.03/SPP/1112

The Principal,
Sapthagiri College of Engineering,
14/5, Chickasandra,
Hesaraghatta Main Road,
Bengaluru - 560 057

Dear Sir,

Sub : Sanction of Student Project (Biofuel) - 40th Series : Year 2016-2017

Your Project Proposal Reference No. :

40S_B_BE_064

Ref : Your Project Proposal entitled "

**REDUCTION OF POLLUTION LEVELS IN THE ATMOSPHERE BY THE
USE OF METHANOL BLENDED PETROL FUEL IN AUTOMOBILE IC
ENGINE AND THE STUDY OF ITS EFFECTS ON THE PERFORMANCE
OF THE ENGINE**

I am happy to inform that your project proposal referred above, has been approved by the Secretary, KSCST for "Student Project Programme (Biofuel) 40th Series" and has been sanctioned with a budgetary break-up as detailed below:

Student / s	Ms. Vidya S.	Budget	Amount (Rs)
	and others	Materials/Consumables	10,000.00
Guide/s	Mr. P. Raghuthama Rao	Labor	-
		Travel	1,000.00
		Analysis	-
Department	Mechanical Engineering	Miscellaneous	500.00
		Report	500.00
		TOTAL	12,000.00
	Rupees Twelve Thousand		

The following are the guidelines to carryout the project work :

- The project should be carried out based on the objectives of the proposal sent by you.
- The project should be completed in all respects and a) **One copy** of the hardbound report b) Softcopy of the full report (including coverpages, abstract & preliminary pages in a CD (.doc and .pdf format)
- The project report shall mention the name of "**Karnataka State Bioenergy Development Board and Karnataka State Council for Science and Technology**" as sponsored organisations in the title page. Project Title or the objectives can be altered only with prior permission of KSCST. Any change in the project are strictly prohibited and liable for rejection and the amount sanctioned has to be returned back to KSCST. The fund is to be utilised only for the activities to which it has been released.
- Please quote your **project sanction reference number printed above** in all your future correspondences.
- Important:** After completing the project, 2 to 3 page write-up (synopsis) needs to be sent by e-mail [biofuelcell.kscst@gmail.com] and should include following :
 - Title of the project
 - Name of the College & Department

KSCST

Principal

Sapthagiri College of Engineering

Principal
Sapthagiri College of Engineering
14/5, Chickasandra, Hesaraghatta Main Road
Bengaluru - 560 057

**A PROJECT REPORT
ON**

**REDUCTION OF POLLUTION LEVELS IN THE
ATMOSPHERE BY THE USE OF METHANOL BLENDED
PETROL FUEL IN AUTOMOBILE IC ENGINE AND THE
STUDY OF ITS EFFECTS ON THE PERFORMANCE OF
THE ENGINE**

Project proposal ref. number : 40S_B_BE_064

Sponsored by KSCST



KSCST
KARNATAKA STATE COUNCIL
FOR SCIENCE AND TECHNOLOGY

Submitted by

- | | |
|--------------------------------|---------------------|
| 1. VIDYA.S | (1SG13ME119) |
| 2. PREMANATH P PEDNEKAR | (1SG13ME087) |
| 3. NIKHIL UMADI | (1SG14ME412) |

Under the Guidance of

P. RAGHUTHAMA RAO

Associate Professor,



**DEPARTMENT OF MECHANICAL ENGINEERING
SAPTHAGIRI COLLEGE OF ENGINEERING
BENGALURU-560057
2016-2017**

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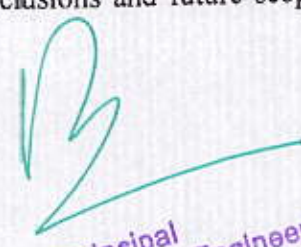
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ABSTRACT

Methanol is an alternative, renewable, environmental friendly and economically attractive fuel, it is considered to be one of the most favorable fuels for conventional fossil-based fuels. Methanol has been recently used as an alternative to conventional fuels for internal combustion (IC) engines in order to satisfy some environmental and economic concerns. Because of a number of relatively large research projects that have been ongoing recently, much progress has been made that is worth reporting. This report systematically describes the methanol productions, including the productions from coal, natural gas, coke-oven gas, hydrogen, biomass etc. It introduces the potentials of methanol as a renewable resource of energy, taking into account the world supply and demand, economic benefits and the effects on human health and the environment. Thirteen methods of application such as methanol gasoline, methanol diesel blends etc. which can be used on the IC engines are summarized. Finally, it puts forward some of the drawbacks of use of methanol as automotive fuel. This project aims at:-

1. Reducing the pollution levels in the atmosphere caused by automobile emissions.
2. Determining the optimum Methanol blend in Gasoline.
3. Studying the performance of the IC Engine with Methanol blended Gasoline.
4. Studying the effects of Methanol blended Gasoline on the Engine components.

An old 4 stroke petrol engine is bought and refurbished & installed on a **MS fabricated base structure**. Emission tests are done for M6, M10, M15, M20, M25, M30, M35, and M40. Performance tests are done for M6, M10, M20, and M30. Percentages of methanol were prepared & kept ready. Using these mixed blends the performance tests & pollution levels' checking were done. The engine is rebored to the highest possible bore size for which the standard piston is available & the increased compression ratio is calculated. Emission tests are done on the rebored engine for M6, M10, M15, M20, M25, M30, M35, and M40. Performance tests are done for M5, M10, M20, and M30. Detailed graphs are for the above data and analyzed w.r.t performance & pollution level variations. Conclusions and future scope are drawn on the basis of these results and observation.


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7.8 PERCENTAGE REDUCTION IN EMISSIONS FOR EACH BLEND FOR C.R 9.84:1

BLEND	CO (%)	HC (%)	CO ₂ (%)
M2	17.896	30.337	23.333
M4	57.240	12.359	14.00
M6	50.409	7.865	23.333
M8	52.185	37.078	12.00
M10	58.606	17.977	2.000
M15	65.027	164.044	308.00
M20	59.836	208.988	130.66
M25	72.404	889.887	352.0
M30	74.453	803.370	310.66
M35	76.366	682.022	245.33
M40	79.644	402.247	178.66

TABLE 7.8 Percentage reduction in emissions for each blend for C.R 9.84:1


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CHAPTER - 8

CONCLUSIONS AND FUTURE SCOPE

8.1 CONCLUSIONS

- Optimum blend for both C.R (9.673:1) & C.R (9.84:1) is M10 with 83.63% reduction in CO levels and least reduction in brake thermal efficiency of 1.19%.
- Blends up to M10 can be used with minimum loss in brake thermal efficiency.
- Blends beyond M10 have a significant reduction in CO emissions. However the loss in brake thermal efficiency is higher.
- The CO₂ emissions increase with increase in methanol blend in petrol as shown in the data & graphs.
- The increase in CO₂ emissions seen in our data is in par with the literatures of previously conducted researches. (Reference: Paper by PhilipE Cassady, Mathematical Sciences Northwest, Inc.)
- Higher C.R reduces pollution level significantly as per the data obtained from the experimental data of this projects investigation.
- From our results, we can safely say that up to 10% of blend can be used in vehicles.

8.2 FUTURE SCOPE

Nowadays, the increase in emissions of the automobiles are a serious concern to humanity. Several regulations such as Bharat 4 and 5, have been laid by the government on the automobile manufacturers to keep pollution levels in check. However, the design constraints alone cannot bring down the emissions to the required level. This poses a need for alternate methods of reduction in emission such as using alcohol fuel blends. In future, necessary steps need to be taken by the government to make methanol blended fuels available at lower prices, support and improve the production method of methanol. The implementation of this will significantly reduce the consumption of fossil fuels worldwide and preserve the resources for future generations. More investigations are needed to effectively optimize methanol blends in petrol engines.

KSCST PROJECTS

UTILIZATION CERTIFICATE

KSCST Student project program 40th series -2016-2017

Sl No	Title of the project	Amount	<p>Certified that KSCST has provided partial financial support of RS 36000/- towards Biofuel and SPP student project program 40th series</p> <p>Sum of Rs36000/- only has been utilize for the purpose Biofuel and SPP student project program for which it was sanction</p>
1	Isolation & identification of Micro labs for absorption and conversion of ammonia, nitrates and nitrogen using Aquaponics system	6,500/-	
2	Forest Monitoring System based on GPRS and powered by iot	7,500/-	
3	Performance and emission analysis of single cylinder si engine varying ethanol blends with petrol	10,000/-	
4	Redaction of pollution levels in the atmosphere by the use of methanol blended petrol fuel in automobile IC engine and study of its effects on the performance of the engine	12,000/-	

Certified that I have satisfied myself that condition on which the grant in aid sanctioned has been duly/are be fulfilled and that I have excise the following check to see that the money was actually utilized for the purpose for which it was sanctioned.

Kinds of check exercised

1. Cash book
2. Vouchers


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Sl. No	Project proposal ref no	Title of the project	Dept./Guide	Amount Sanction by KSCST	Amount utilized by the college	Balance if any to be refunded to KSCST
1	40S_B_0183	Isolation & identification of Micro labs for absorption and conversion of ammonia, nitrates and nitrogen using Aquaponics system	BT/ Prof. Saranya D / Prof. Ananda H V/ Prof. Blessy Baby Mathew	6,500/-	6,500/-	0
2	40S_B_2312	Forest Monitoring System based on GPRS and powered by iot	EC/ Prof. Suma V Shetty	7,500/-	7,500/-	0
3	40S_B_049	Performance and emission analysis of single cylinder si engine varying ethanol blends with petrol	ME/ Prof. Raghuthama Rao	10,000/-	10,000/-	0
4	40S_B_064	Reduction of pollution levels in the atmosphere by the use of methanol blended petrol fuel in automobile IC engine and study of its effects on the performance of the engine	ME/ Prof. Raghuthama Rao	12,000	12,000	0



Signature of the Principal with seal

Signature of Auditor with seal

Date: _____
Principal
Sapthagiri College of Engineering
Chikkasandra, Hesaraghatta Road
Bangalore-560 057

Date: _____

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