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Analytical Study on the Impact of Different Biodiesels Addition on Performance, Combustion, and Emission Parameters of DI Single Cylinder Diesel Engine

Shaik. Kasim sharif¹, B. Nageswara Rao², and Donepudi Jagadish³

¹Research Scholar, Mechanical Engineering Department, VFSTR (Deemed to be University), Vadlamudi, Guntur, India

²Professor, Mechanical Engineering Department, VFSTR (Deemed to be University), Vadlamudi, Guntur, India

³Professor, Mechanical Engineering Department, Narasaraopet Engineering College, Narasaraopet, India

¹sheriff2sheriff@gmail.com, ²director_ies@vignan.ac.in, ³djagadish.009@gmail.com

Corresponding Author: Dr B. Nageswara Rao

Email: director_ies@vignan.ac.in

Abstract

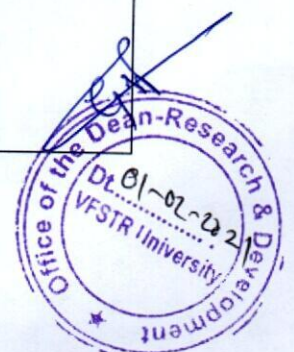
Biodiesel is a significant energy option for more than a century in Direct Diesel injection engines. The bio-diesel derives from non-eatable stocks like Micro Algae and Karanja. Many laboratory experiments have been conducted on Micro Algae and other biodiesel engines, yet there is little theoretical research about this biodiesel diesel engine. This research provides a theoretical thermodynamic analysis on the subject with biodiesel obtained from Micro-Algae and Karanja fuelled in the single-cylinder four-stroke DI diesel engine. With multiple performance parameters, multiple thermodynamic zone models were created in current research to calculate the reliable and temperature cylinder history. For reasons of agreement, the outcomes of the model are valid, with experimental values. This present analytical work evaluates the performance, combustion and emission characteristics of microalgae and Karanja biodiesel blends of 20% fuelled and comparison with Diesel. The theoretical investigation conducted using Diesel-RK software under the settings of constant speed at full load.

Keywords

Theoretical analysis, Diesel engine, Diesel-RK software, Engine performance, combustion and emissions.

1. Introduction

Currently, the cost of petroleum diesel has grown and crossed the value of certain types of vegetable oil due to global economic turmoil and other reasons. Biodiesel has been recognised as diversified fuel and the potentially possible diesel engine alternative[I]. The oil feedstocks for biodiesel production cannot be afforded by developing countries since their culinary demands do not meet their expectations. Thus, these nations use non-eatable feedstocks to create their bio-diesel. Various experimental studies have been conducted on Micro Algae and Karanja biodiesel engines, but there are evident inadequacies in thermodynamic models for analytic performance analysis. In particular, thermodynamic models are reliant on energy conservation laws based on "thermodynamics first law". The models are divided into three categories as zero-dimensional, Phenomenological and Quasi-Dimensional models[II]. Geometric characteristics of the fluid motion cannot be anticipated in zero-dimensional designs as the flow modelling is inconsistent. In addition to energy conservation equations, specific details may be integrated for each phenomenon in phenomenological models[III].



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F.No: VFSTR/Reg/A1/131/2018

Date: 24/08/2018

Sub : VFSTR- Constitution of Institutional Academic Integrity Panel (IAIP)- Regarding

Ref: UGC Notice Regarding - promotion of academic integrity and prevention of plagiarism in higher educational institutions regulations, 2018, dt: 23/07/2018.

INSTITUTIONAL ACADEMIC INTEGRITY PANEL

ORDER:

A committee with the following composition is hereby constituted to form Institutional Academic Integrity Panel (IAIP) of VFSTR : -

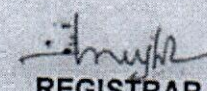
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| a. Dr. V. Madhusudhan Rao, Dean-E&M | - | Chairman |
| b. Dr. P.M.V. Rao, Dean-Evaluation | - | Member. |
| c. Dr. K. Phaneendra, Principal, VLITS, Vadlamudi | - | External Member. |
| d. Dr. K.V. Krishna Kishore, Dean-IT Services | - | Member. |


The Committee will be guided by the UGC regulations "University Grants Commission (promotion of academic integrity and prevention of plagiarism in higher educational institutions) regulations, 2018." dated: 23/07/2018.

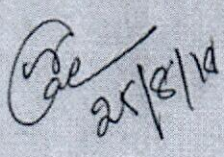
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PROCEEDINGS OF REGISTRAR**F.No: VFSTR/Reg/A1/131/2018****Date: 27/08/2018**

Sub : VFSTR- Constitution of Departmental Academic Integrity Panel (DAIP) -
Regarding

Ref: 1. UGC Notice Regarding - Promotion of Academic Integrity and Prevention of
Plagiarism in Higher Educational Institutions regulations, 2018, dt: 23/07/2018.
2. Approved orders of the Vice-Chancellor dated 25.08.2018.

DEPARTMENTAL ACADEMIC INTEGRITY PANEL**ORDER:**

The Composition of the Departmental Academic Integrity Panel (DAIP) is given below:

Sl. No	Dept.	Chairman (HoD)	Sr. Academician from outside the Department	Member well versed with anti-plagiarism tools
01	Applied Engg.	Dr. D. Satyanarayana Associate Professor	Dr. Gamini Suresh Assistant Professor of Mech. Engg.	Dr. Edwin Benjamin Assistant Professor
02	Bio- technology	Prof. Dr. S. Krupanidhi Professor	Dr. N. Veeranjanyulu Professor of Information Technology	Dr. Gollapalli Pavan Scientist, Dept. of Biotechnology
03	Civil Engg.	Dr. N. Ruben Associate Professor	Dr. K. Venkata Rao Professor of Mech. Engg.	Dr. P. Gopinathan Assistant Professor
04	Chem. Engg.	Dr. M. Ramesh Naidu Associate Professor	Mr. Ch. Govardhan Rao Assistant Professor of Textile Technology	Mr. P. Ashok Kumar Associate Professor
	Food Technology	Dr. M. Ramesh Naidu Associate Professor	Mr. Avinash Barooh Assistant Professor Petroleum Engg.	Mr. D. P. Siva Prasad Assistant Professor
	Petroleum	Dr. M. Ramesh Naidu Associate Professor	Mr. P. Manoj Kumar Assistant Professor of Food Technology	Mr. Prathamesh Dilip Sapale Assistant Professor
	Textile Technology	Dr. M. Ramesh Naidu Associate Professor	Mr. P. Ashok Kumar Associate Professor of Chem. Engg.	Mr. Mohd. Wasim Chauhan, Assistant Professor
05	CSE	Dr. D. Venkatesulu Professor	Dr. K.V. Krishna Kishore Professor of Information Technology	Dr. S. V. Phani Kumar Associate Professor
06	ECE	Mr. T. Pitchaiah Associate Professor	Dr. K. Mercy Roasalina Associate Professor of EEE	Dr. J. Muralidharan, Assistant Professor
07	EEE	Dr. G. Srinivasa Rao Professor	Dr. M. Ramesh Naidu Associate Professor of Chem. Engg.	Mr. M. Subba Rao Assistant Professor
08	IT	Dr. K.V. Krishna Kishore Professor	Dr. K. Hemantha Kumar Professor of CSE	Dr. N. Veeranjanyulu Professor



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09	Mech. Engg.	Dr. L. Suvarna Raju Professor	Dr. N. Ruben Associate Professor of Civil Engg.	Dr. D. Vinay Kumar, Assistant Professor
10	MBA	Dr. K. Kalpana Associate Professor	Dr. A. Sharada Professor of English	Dr. B. Madhusudhan Rao, Professor
11	Chemistry	Dr. N. Srinivasulu Professor	Dr. M. Srinivasulu Professor of Physics	Dr. K. Prabhakar Associate Professor
	Physics	Dr. N. Srinivasulu Professor	Dr. K. Prabhakar Associate Professor of Chemistry	Dr. M. Srinivasulu Professor of Physics
	Mathematics	Dr. N. Srinivasulu Professor	Dr. J. Nitchal Kiran Associate Professor of Physics	Dr. P.L.N. Varma Professor
	English	Dr. N. Srinivasulu Professor	Dr. V. Radha Krishna Murthy Professor of Mathematics	Dr. A. Sharada Professor

The panels will be guided by para 10 of the UGC regulations "University Grants Commission (promotion of academic integrity and prevention of plagiarism in higher educational institutions) regulations, 2018." dated: 23/07/2018 (copy enclosed for ready reference).

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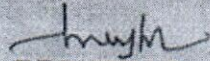
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
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