

SYNTHESIS AND ANALYSIS OF EPOXIDIZED JATROPHA OIL BIOLUBRICANT

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College : *Vidyavardhaka College of Engineering, Mysuru*

Branch : *Department of Biotechnology*

Guide(s) : *Prof. Sudharshan N*
Prof. Shreyas M

Student(S) : *Mr. Nithin B Vasishta*

Mr. Nikhil K M

Mr. Nandeesh B G

Mr. Kushal N

Introduction:

1. Stronger environmental concerns and growing regulations over contamination and pollution will increase the need for renewable and biodegradable lubricants.
2. Vegetable oils are a viable and renewable source of environmentally favourable oils.
3. The work is focusing on the wear, friction study and tribological evaluation of the Biolubricant from Jatropha oil and synthesized through chemical modification.
4. Chemical modification i.e., epoxidation is done to increase the oxidative stability, lower pour point and friction reducing ability compared to base oil.
5. In this project we sought to extend our investigation and to test the tribological characteristics of non-edible Jatropha oil based Biolubricant.
6. The reason of selecting Jatropha oil as base stock is it doesn't contend with the food, have very good oily content and can be grown in marginal land.

Objectives:

1. Synthesis of environmental friendly bio lubricant.
2. Chemical modification of Jatropha oil by epoxidation process.
3. To determine physical and tribological characteristics of vegetable oil.
4. To benchmark the tribological performance of epoxidized vegetable oils
5. with commercial mineral engine oil.
6. To promote vegetable oils as an alternative for petroleum-based lubricants.

Methodology:

1. Collection of raw vegetable oil.
2. Chemical modification of vegetable oil by Epoxidation process.
3. Iodine Value test after epoxidation.
4. Density test.
5. Viscosity test.
6. Flash and Fire point test.
7. Wear and Friction test.

Conclusion:

Based on the experiments conducted in the present work, the following conclusions are drawn:

1. Chemical modification of Jatropha oil through Epoxidation process results reduced Iodine value.
2. Epoxidation process improves Tribological properties such as wear and friction.
3. Four Ball Tribo test shows reduced co-efficient of friction and frictional torque for Epoxidized Jatropha oil.
4. And also by measuring wear scar diameter of the ball after four ball tribo test, we can conclude the reduced wear scar diameter for Epoxidized Jatropha oil.

Future Scope:

As part of future research work the formulated bio-lubricants can be subjected to non-destructive engine test and engine trial of the bio-lubricant can be done to study the friction and wear properties of the bi-lubricant after the engine trial.