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Review paper

"Derivatives of seed oil as a biodegradable lubricants"

Sanket Kumar Saxena, V.K. Chhibber, Harish Chandra Joshi, O.N. Anand

Department of chemistry Shivalik College of Engineering, Dehradun-248001

Abstract: The main aim of our study is to synthesize the biodegradable lubricant from the seeds of Indian origin. For our aim to be accomplished we have taken two oils (1).Mustard Seed Oil (2) Sal Seed Oil. Through various processes such as seed crushing, extraction and refining we obtain the pure form of oil and then lubricating oil. The lubricating oil should not be more viscous and should not contain any moisture content beyond its lubricating value. So the good lubricant should be ecofriendly in nature besides being biodegradable. We have gone through different oils of Indian origin rather than mineral oil.

Keywords: Mustard seed; Sal seed oil; Essential Oil and Lubricants

1. Introduction

Lubricants are the chemicals which are becoming the important part of our lifecycle due to the need to enhance the life of machine parts and their efficient working condition. The primary use of lubricants is to reduce wear and tear and friction for the smooth running of machine parts. Lubrication is necessary to enhance the service life of a machine. Various lubricants used are petroleum based lubricants and their derivatives. The choice of a better lubricant should be done in such a way so that it should have the following features according to the design and working conditions of machinery so that wear and tear, friction can be minimized at operating temperature and load at the same time. It also affects the cooling of the rubbing surfaces. Important parameters expected from a good lubricant are:

(1). Optimum viscosity at the operating temperature as well as when the machinery is at the ambient temperature which could range from moderate to very low temperature depending upon the atmosphere condition and operating parameters.
(2). It should have optimum lubricity at the operating temperature and load, reducing the friction to minimum between the rubbing surfaces.
(3). It should remain fluid at the ambient temperature and have good thermal and oxidative stability at operating temperature
(4).It should not toxic to living organisms.
(5).It should not result in accumulation in air, soil and water and preferably biodegradable to renewable extent.

In recent times nontoxicity and biodegradability has assumed important significance due to Environmental concerns. Legislations are being introduced in many countries for environmental protection and in applications such as,

(1) Total Loss Lubricants.
(2) In food processing industry & textile machinery.
(3) In greases and metal working industry.
(4) Hydraulic Oils.

Most of these lubricants are either synthetic esters comprising of fatty acids and dibasic acids and polyols or the modified fatty oils (vegetables oils) or their derivatives such as esters. Vegetable oils based products find use as chainsaw lubricants, two stroke engines oils, food processing units, water installation, and rail road. Lubricants and metal working fluids and the hydraulic fluids. Possibilities are being explored to use these products as gear lubricants and even in high temperature applications. In western countries the vegetable oil such as canola oil, soybean oil, ricebran oil and their derivatives are being considered as a possible source of vegetable lubricants. In India we have very wide variety of vegetable based oils which are not only agriculture based but also of forest and waste land origin. The important and abundant vegetables oils of waste land origin are Mahua oil, Sal seed

oil, Jatropha Carcass and from agricultural origin such as Rapeseed oil, Mustard oil, Ricebran oil and Castor oil.

2. Discussion

There are currently 44 lubricant companies in the market including Total, Gulf, Shell and Veedol. Besides brands from the three governments controlled oil companies-IOC, BHARAT. Petroleum Corporation and Hindustan Petroleum Corporation- which together holds over 50% share. The total lubricant market in India is 1.6 million lts. Of which automotive use in about 95 million litres. The lube market consists of two major segments, automotive and industrial having a market share of 60% and 40% respectively. The automotive segment cars and two or three wheelers accounts for 30% of the market. Diesel Operated engines, trucks and other heavy vehicles have the bulk share of 70%. Because the lubricating Oil and grease market in India is of the order of 1.6 million liters and is growing at around 1.5% annually therefore it is expected to grow to the level of 2 million ton in 2014-15. In order to meet biodegradability & environmental regulations we have to import required quantity of biodegradable lubricants or develop indigenous biolubricants.Biodegradable lubricant can be vegetable oil based or synthetic ester. Use of biodegradable lubricants which are mainly derived from genetically modified vegetables oils, would be used in industrial, agricultural and forest sectors and eventually in the transport. The study comprises primarily of two vegetables oils namely (a) with high concentration of unsaturated fatty acids such as mustard oil and (b) higher concentration of saturated fatty acids such as sal seed oil As a starting materials. These will be refined, partially hydrogenated or heat treated before converting in to mono and diesters, alkaryl derivatives and epoxy product. The physic-chemical properties such as refractive index, viscosity, viscosity index, melting point, Thermooxidative stability and lubricating

Properties such as welding load, mean hertz load, wear scar diameter and coefficient of friction will be subjected to study. But in India:

(1).Volume of vegetable oil based lubricants is very low.
(2).Applications are limited to industries using imported machinery and the lubricants recommended by equipment manufacturers.
(3).Absence of public pressure on environment protection.
(4).Lack of efforts by governmental agencies and lubricant manufacturers.
(5).Serious air pollution caused by two stroke engines lubricants.
(6).Tractor oils, cutting fluids, generator pump sets food processing and water management machinery.

3. CONCLUSION

After citing so many logical reasons why should we adopt the strategy of using vegetable based oil lubricant in spite of using mineral based lubricant, we can conclude our statement with the help of
Following points:

(1).Though their thermooxidative stability is not very good but it can be made so by adding certain additives.
(2) They are biodegradable
(3) They are ecofriendly
(4)They are not so much costlier.
(5) They cannot be proved explosives in comparison to mineral based or origin.
(6) Less danger of intoxication.
(7) Carbonaceous matter will be low.

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