UPGRADING AND UTILIZATION OF SOAPSTOCK AND SOME AGRICULTURE WASTE FOR PREPARATION THE LUBRICATING GREASES

Submitted By

Ahmed Aly Abd El-Wahed Ibrahim

B.Sc. of Science, (General Oceanography), Faculty of Science, Alexandria University, 1986

Master of Chemical Oceanography, Faculty of Science,

Alexandria University, 1999

A thesis submitted in Partial Fulfillment
Of
The Requirement for the Doctor of Philosophy Degree
In
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Department of Environmental Basic Sciences
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2016

قَالُوا سُبْحَانَكَ

لَا عِلْمَ لَنَا إِلَّا مَا عَلَّمْتَنَا

إِنَّكَ أَنْتَ الْعَلِيمُ الْحَكِيمُ

(سورة البقرة الأية ٣٢)

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ABSTRACT

Pruning of the very large quantities of rice straw (RS) which amount to about 3.28 million ton per year causes a series environmental problems. The utilization of rice straw as thickening and filling agents in the production of lubricating grease constitutes, therefore, one of the major outlets in this respect. On the other hand, this could be considered as a novel application in the area of lubricants manufacture. In the present investigation, the physicochemical characteristics of rice straw were determined. This was followed by treating rice straw with sodium hydroxide solutions of different concentrations for a different periods ranging from 2 to 6 hours at various temperatures of 80 ^{o}C up to 120 ^{o}C Furthermore, vegetable oils have significant potential as a base fluid . In this respect, waste cooking oil was used as a substitute of the fresh vegetable oil. The physicochemical properties of the waste cooking oil were also investigated. Accordingly, the optimum yield from treated rice straw (TRS) and waste cooking oil (WCO) were both utilized in the preparation of such lubricating grease. The physicochemical properties of one or more were evaluated according to National Lubricating Grease Institute (NLGI) and Egyptian Standard (ES). It was found that the obtained greases have promising results from the economical and environmental aspect.

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