

Non-Confidential Description - PSU No. 3625
**“Process Development for Preparation of Nitrogen Containing
Vegetable Oil Based Lubricant Additive”**

Keywords:

Lubricant additives, petroleum, environmentally friendly, nitrogen

Inventors:

Atanu Biswas, Brajendra K. Sharma, H. N. Cheng,

Background

The United States lubricant additives market utilizes 1.8 billion pounds of deposit control additives, viscosity index improvers, antiwear and extreme pressure additives, antioxidants, corrosion inhibitors, defoamers, and pour point depressants per year, at a cost of over \$1.7 billion. Within this market, prices will continue to increase as higher value, higher-performing additives are used to meet original equipment manufacturer (OEM) and consumer safety and performance requirements. In addition, the increasing use of non-petroleum basestocks will require higher additive treat rates. Currently, the majority of these additives are petroleum based, providing an opportunity for a bio-based lubricant additive that is environmentally friendly, cost-effective, and of superior quality.

Invention Description

The invention describes the preparation of bio-based lubricant additive as an alternative to current petroleum-based additives. The process converts any vegetable oil (soybean oil in this case) into a nitrogen-containing molecule that has potential as a bio-based lubricant additive. This reaction uses a catalytic amount of an ionic liquid; no solvent or byproducts were produced, and the ionic liquid can be recovered and recycled.

The easy availability of raw materials, non-toxic character of the bio-product, and the potential to deliver better properties when compared to available mineral oil based technology all prove this technology advantageous. Lubricant additives compounds are premium priced and highly application specific. This technology will deliver a bio-based compound that can deliver better functional properties compared to existing commercial additives at a much lower price.

This technology uses renewable resources (vegetable oil) and presents a green methodology that can be easily adopted for commercial scale-up. Since the raw materials are solely derived from vegetable oils, the commercialization of this process will contribute to the local agro-economy of the region and nation.

Advantages/Applications

- Better properties compared to currently available mineral oil-based technology
- Easy availability of raw materials (vegetable oil) and a non-toxic bio-product
- Lower price than current solutions

Contact: William H Gowen
Sr. Technology Licensing Officer
The Pennsylvania State University

Phone: (814) 863-7070
Fax: (814) 865-3591
E-mail: whg10@psu.edu