

# Technology Licensing Opportunity

Non-Confidential Summary



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## PROCESS FOR PRODUCING A LUBRICANT FROM AN EPOXY-TRIGLYCERIDE ROI # 12-021

### ***Opportunity:***

This invention is a process for esterification of epoxy-triglycerides using a heterogeneous catalyst to produce a lubricant. This process represents an environmental and sustainable application because the heterogeneous catalysts allows for the ease of separation, catalyst reuse and environmental safety.

### ***Background:***

Extensive use of petroleum-based lubricants creates a number of environmental issues. Examples include surface water and ground water contamination, air pollution, soil contamination, and agricultural product and food contamination. Vegetable oil based lubricants are a highly attractive substitute to petroleum based lubricants because they can be environmentally friendly, renewable, non-toxic and completely biodegradable.

Global demand for bio-lubricants was 585.2 kilo tons in 2013 and is expected to reach 915.4 kilo tons by 2020, growing at a CAGR of 6.6% from 2014 to 2020. North America was the largest regional market for bio-lubricants with projected market demand of 343.7 kilo ton by 2020. Knowing that palm oil and castor oil are the major sources for bio-lubricant production, introduction of canola oil will diversify the raw material market and increase market competitiveness.

### ***Invention:***

- Excellent lubricity properties
- High viscosity index, high flash-point, low volatility
- Can be used directly in bio-diesel without addition of synthetic additives
- Use of heterogeneous catalyst ensures product recovery and catalyst longevity

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### *Researcher profiles:*



Professor Ajay Dalai's research areas include environmental catalysis such as alkylates from butane using solid acids and conversion of sulphur containing compounds from gases and waste water and other streams; chemical process and product development; upgrading and hydro-treating of hydrocarbon fluids; renewable energy such as hydrogen and bio-diesel from bio-mass and bio-oils; value-added chemicals from glycerol; production and applications of activated carbon for mercury removal from flue gases; production of carbon nanotubes, and their catalytic applications.

### *Patent Status:*

Canadian patent application was filed on June 9, 2014

### *Publications:*

Sharma RV, Dalai AK. Synthesis of bio-lubricant from epoxy canola oil using sulfated Ti-SBA-15 catalyst. Applied Catalysis B: Environmental 142-143 920131): 604-614.

### *Development Stage:*

Product is ready for licensing to a commercial partner.

### *For more information, please contact:*

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