

提案公告：黃豆生質潤滑油合成配方之開發

Request for Proposal – Study of Soy Bio-lubricant Production Formula Development

本協會擬委託國內研究機構或大學，進行開發以環氧黃豆油(epoxy soybean oil)經化學修飾法(chemical modification)所製成的黃豆油雙酯(diester of soybean oil)為原料之黃豆生質潤滑油(soy bio-lubricant)合成配方。本產品是一種環保型生質潤滑油(eco-friendly bio-lubricant)，用作取代石油系汽車用機油(engine oil)，將是我國改善環境污染問題執行上的一項利器。此乃世界的潮流，歐美各國已成功開發及上市多種生質潤滑油產品於市場販售。

為回饋台灣植物油業及相關產業對美國黃豆的長期支持，本協會除於本會網站報導相關新知，特提出以下計劃，希望國內研究機構在短期內開發出「生質潤滑油」之合成配方，提供給台灣產業使用黃豆油開發環保產品之參考。

計劃內容應包括：

1. 緒言：簡述國內潤滑油(lubricants)市場現況及推行黃豆生質潤滑油替代(或部份替代)石化潤滑油的可行性與潛力。請以汽車用機油為本計劃之目標市場。

2. 原料與方法：

(A)原料：必須採用以美國環氧黃豆油經化學修飾改質之黃豆油雙酯(diester of soybean oil)為原料。為成本考量，國產環氧黃豆油亦可使用，惟需指定其原料為美國黃豆。

(B)方法：

①基礎油(base oil): 黃豆油雙酯已知具較低氧化安定性、高低溫流動點及高粘度等缺點，提案應包括生產上述性狀已獲改善之基礎油配方。

②黃豆生質潤滑油: 詳述以上述基礎油為原料配製之生質潤滑油(汽車用機油)商用產品配方，包括相關理化特性(如美國石油協會—American Petroleum Institute, API 或經濟部標準檢驗局 CNS 規範所列特性)之訂定。需知高品質基礎油將是本計劃成功之關鍵因素。

③所配製產品的特性與測試。提案單位需描述本身具備執行/完成以下工作之能力：

- i) 配製生質潤滑油(汽車用機油)供分析與測試之用，其項目應包括目標產品—汽車用機油之標準理化特性。
- ii) 針對測試結果建議各種添加劑配方，以改善所配製潤滑油(機油)所需之理化特性—氧化安定性、低溫流動點、粘度、粘度指數、抗磨性、抗腐蝕性等。
- iii) 進行實際廠商測試與討論(包括與石油系產品對照比較)。
- iv) 效果鑑定與儀器設備。
- v) 經濟效益分析：除了產品成本，丟棄費用成本外，低污染環保性、揮發性(volatility)(即產品消耗性)，低換油性(oil mileage)，高作業效能(performance)，高閃火點作業安全性，仍甚為重要，應列入考量。

3. 計劃進度與期間：2010年2月-12月。

4. 所需研究經費與研究陣容。經費應按主要會計項目如研究開發、原料、差旅、印刷、會議、管理等加以分列。

5. 專業成就與已發表刊物文獻。

有意者請於2010年1月28日以前，將詳細中英文計劃書及所需研究經費，以電子郵件(asatwn@ms75.hinet.net)逕寄本協會，逾期不予受理。

美國黃豆出口協會(ASA-IM)

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日期：2009年1月7日

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We are requesting for proposal from local research institute or university for conducting a study to develop the production formula of bio-lubricant by using chemically-modified diester of epoxy soybean oil. As an eco-friendly bio-lubricant, this product will be targeted at replacing petroleum-based engine oil for automobile to help improve pollution problems. It has been a world-wide trend and there have been commercial products being sold in the United States and countries in the EU for so many years since the early 90's.

In order to return the long-time supports from Taiwan's crushers and related industries, we have continuously published related news about the development of industrial/eco-friendly uses of soy on our website. Furthermore, we are proposing this plan with the goal of developing a formula of producing bio-lubricant as reference for the lubricant industry to use in developing eco-friendly product and expanding the use of soybean oil for industrial application.

The content of the proposal should include the followings:

1. Introduction: briefly describe the lubricant market situation and the feasibility and potential of replacing petro lubricants with soy bio-lubricant, targeted at engine oil for automobile in Taiwan.
2. Materials and Methods:
 - A. Material: diester of epoxy soybean oil processed from U.S. soybeans.
 - B. Method:
 - a 、 Base oil: describe the formula of base oil using soy ester as material in which the low stability, high pour point and high viscosity of soybean oil have been improved.
 - b 、 Soy bio-lubricant: provide a plan or suggested formula on how to process bio-lubricant with the above-defined base oil.
 - c 、 Characteristics and tests for the developed product. Interested party should detail its capability of:
 - i.Processing the bio-lubricant for testing. Testing items should include the standard characteristics of engine oil for automobile.
 - ii.Making recommendations on improvement of the disadvantages of bio-lubricant developed in this study including low oxidative stability, high pour point, viscosity, viscosity index, anti-wear and anti-erosion etc.
 - iii.Conducting market test and discussion (including comparisons with petroleum and synthetic products).
 - iv.Analyzing the results for further study.

v. Assessing the economics of soy bio-lubricant as the substitute for petroleum lubricant as automobile engine oil in Taiwan.

3. Time of execution: January – December 2010
4. Requested budget and research team. Please provide a breakdown of the budget by category such as research & development, materials, transportation and per diem, printing, conference, management fee and others.
5. Any other professional achievements or technical references available.

Any party interested in bidding for the project should send your proposal together with requested budget in electrical form to us at asatwm@ms75.hinet.net before January 28 2010. Proposal received after the deadline will not be acceptable.

ASA-IM

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Email: asatwn@ms5.hinet.net

Date: January 7, 2009