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A Review: Role of Fatty Acids Composition in Characterizing Potential Feedstock for Sustainable Green Lubricants by Advance Transesterification Process and its Global as Well as Pakistani Prospective

By: Gul, M (Gul, M.)^[1,2]; Masjuki, HH (Masjuki, H. H.)^[1,3]; Kalam, MA (Kalam, M. A.)^[1]; Zulkifli, NWM (Zulkifli, N. W. M.)^[1]; Mujtaba, MA (Mujtaba, M. A.)^[1,4]

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Abstract

High demand for crop oils is anticipated in the lubricant industry because of their renewable, non-toxic, environment-friendly nature. Crop oils typically offer high viscosities, viscosity indexes, and flashpoints. The unique structure of crop oils provides good lubrication, high flammability, and anti-corrosion ability. In contrast, petroleum-based lubricants face a difficult future because of declining petroleum reservoirs that will increase their prices. This paper reviews green-lubricant feedstock requirements, the effect of fatty acids composition to improve physicochemical properties, chemical modifications of green lubricants by applying transesterification to find suitable environmentally -friendly and cheaper feedstock to replace petroleum lubricants. Moreover, global and Pakistani indigenous crop oils are also analyzed for their potential use in green lubricants by comparing their fatty acid compositions, characteristics and reaction conditions according to applications and standards. This review discovers that cottonseed oil has great potential as a new sustainable and cheaper feedstock for the global and Pakistani green-lubricant markets. Green lubricant production rate can be enhanced significantly after upgrading the conventional production method. It is believed that this review paper will provide useful information to engineers, researchers, chemists, industrialists, and policymakers, who are interested in green-lubricants synthesis.

Keywords

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Author Information

Corresponding Address: Gul, M; Masjuki, HH (corresponding author)

Univ Malaya, Dept Mech Engr, Ctr Energy Sci, Kuala Lumpur 50603, Malaysia.

Corresponding Address: Gul, M (corresponding author)

Bahauddin Zakariya Univ, Univ Coll Engr & Technol, Dept Mech Engr, Multan 60000, Pakistan.

Corresponding Address: Masjuki, HH (corresponding author)

IIUM, Fac Engr, Dept Mech Engr, Kuala Lumpur 50728, Malaysia.

Addresses:

[1] Univ Malaya, Dept Mech Engr, Ctr Energy Sci, Kuala Lumpur 50603, Malaysia

[2] Bahauddin Zakariya Univ, Univ Coll Engr & Technol, Dept Mech Engr, Multan 60000, Pakistan

[3] IIUM, Fac Engr, Dept Mech Engr, Kuala Lumpur 50728, Malaysia

[4] Univ Engr & Technol, Dept Mech Engr, City Campus Lahore, Lahore, Pakistan

E-mail Addresses: mustabshirha@yahoo.com; masjuki@um.edu.my

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