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Heterogeneous Catalyst Screening for Biodiesel Production from *Moringa* Oil**Nor Badariah Talib¹, Sugeng Triwahyono^{1,2*}, Aishah Abdul Jalil³, Khalidah Puad¹, Muataz Syakir Khayoon², Abdelaziz Emad Atabani⁴**¹ Department of Chemistry, Faculty of Science, UTM Skudai Johor, Malaysia² Ibnu Sina Institute for Fundamental Science Studies, UTM Skudai Johor, Malaysia³ Department of Chemical Engineering Faculty of Chemical Engineering, UTM Skudai, Johor, Malaysia⁴ Erciyes University, Kayseri, Turkey

The production of biodiesel as an alternative to fossil fuels has gained world interest nowadays due to global energy crisis and environmental awareness. Biodiesel is the preferred choice because it is environmental friendly as it decreases the possibility of acid rain and greenhouse effect by reducing the emission amount of CO_x, SO_x and hydrocarbons that are incompletely burned during fuel combustion compared to diesel¹. The strict regulations made by the environmental protection agency (EPA) to reduce the noxious emissions and the governmental legislations have motivated the biodiesel industry to formulate the new makeup diesel/biodiesel blends (B10 and B20)². According to research by US Geological Oil and Gas Journal (1995-2000), Malaysia petroleum resources only can last for less than 50 more years³. Despite new oil reservoir discoveries in areas such as the Gulf of Mexico and the Tupi and Guara fields off South-East Brazil, Sudan, the Caspian Sea, Sakhalin, and in the Arctic⁴, fossil fuels is no longer reliable as it is expensive and depleting sources.

Biodiesel sources are renewable as it can be produced from vegetable oil, tallow, lard and waste cooking oil⁵. Vegetable oil can be categorized into two, edible and non-edible. Numerous research of biodiesel has been made using edible feedstock like palm, soybean, and sunflower oils. However, considering that edible vegetable oils are expensive, researchers has prompted to establish a cheap feedstock for biodiesel from non-edible crops. This study reports a catalyst screening process for biodiesel production from *Moringa* oil via transesterification process using various heterogeneous catalysts with methanol. The reaction condition is fixed throughout the process which are 3wt.% catalyst loading, 9:1 methanol to oil ratio, reaction temperature of 60°C and 60 min reaction duration to determine the best catalyst for the biodiesel conversion from *Moringa* oil.

1. Helwani, Z.; Bakar, M.Z.A.; et. al. Energy Conv. Management 2013, 73, 128-134.
2. National Vehicle and Fuel Emission Laboratory. CCD-05-12. Michigan : US Environmental Protection Agency 2005.
3. Syah, A. N.A.; A. Aziz, M. F.; Sidek, C. M. Synergy Media 2009
4. Gerhard, K.; Jurgen, K. AOC Press 2010, 2nd Ed.
5. Schumacher, L.G.; Gerpen, J.V.; Adams, A. Encyclopedia of Energy. 2004, 1, 151-152.

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