



Technology Available for License: Plant Oils to Jet Fuel and other High Value Chemicals

Researchers at Montana State University-Northern have developed a process to convert camelina oil to jet fuel and other high value chemicals in a continuous flow process at low temperature and pressure. This process yields butane, pentane, gasoline, diesel, triglycerides and oleo-chemicals among others but the research is primarily directed at jet fuel production. Jet fuel produced from the discussed process meets the ASTM D6755 standard.

The US consumes about 22 billion gallons of jet fuel from the 73 billion gallons produced worldwide. Recent studies have indicated that aircraft contribute to about 3.5% of global warming through the emission of NO_x, CO₂, CO, SO_x and other particles and soot. Oil seed fuel derived from this process will dramatically lower those impacts.

To date, synthetic paraffinic kerosene (SPK) and hydro-processed esters and fatty acids (HEFA) produced by a Fischer-Tropsch (FT) method and hydrotreating of natural oils, respectively are the only advanced renewable jet fuels that have been certified by ASTM. While SPK and HEFA are both non-oxygenated, containing carbon chain lengths comparable to conventional jet fuel, they have deficiencies in terms of fuel properties mainly due to the lack of aromatic hydrocarbons. This imparts limits their blending ratio. Moreover, both SPK and HEFA are produced from high energy input processes.

The new process discussed here is an attractive alternative to these current methods because the product contains up to 21% aromatic hydrocarbons and requires mild conditions to achieve good conversion. Additionally, the process produces a high value co-product -mid chain triglycerides - that can be marketed to the oleo-chemical industries. The process utilizes known components, common inexpensive inputs and continuous flow reactions. Yields are approximately 70%, non-optimized.

This invention is the result of work by Dr. Nestor Soriano, Dr. Randy Maglinao and Akash Narani of the Bio Energy Center at Montana State University-Northern.

Technology Transfer and Development Status: A patent is pending and research is ongoing.

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