



Case #338

Production of Low Viscosity Renewable Fuels using Photo-Fenton Decarboxylation

Key to a sustainable future is the replacement of petroleum-based diesel and other petro-fuels with renewable fuels. Biodiesel has been a great first step towards that end, performing similarly to petroleum diesel, while providing benefits to the environment and economic security, but feedstock and production reagent requirements, as well as its high viscosity, cold weather performance and incompatibility with existing engine and distribution infrastructure show there is room for improvement. This chemical conversion process developed at UVM is a photo-Fenton decarboxylation process, using UV light, a hydrogen peroxide reagent, and an iron salt catalyst at room temperature to produce a green diesel biofuel with superior properties compared to current biodiesel. Green diesel has hydrocarbon fuel products that are much more like petro-diesel, with lower viscosity and better cold weather capabilities. The lack of an esterification process also allows the producer to use lower quality feedstocks, reducing costs, while producing a better end product.

Applications:

- Production of green diesel biofuel from a wide variety of feedstocks.

Advantages:

- Less costly and more flexible feedstock supply.
- Environmentally friendly and less costly reagents.
- Lower energy input requirements.
- Lower viscosity fuel and improved cold weather performance.
- Fully compatible with existing engines and distribution infrastructure.
- Reduced greenhouse emissions and blending requirements.

Intellectual Property and Development Status:

US Patent 9,272,275

Licensing opportunities available.

References:

Green Mountain Spark <http://vermontbioenergy.com/green-mountain-spark-llc/#.WrEhk1WGOvE>

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