

Hydrothermal Liquefaction (HTL)

Bio-Crude Oil Upgrading

Advanced Biorefinery Technologies Ltd

Our Hydrothermal Liquefaction (HTL) technology doesn't stop at producing bio-crude oil. Through an advanced upgrading process, we convert HTL-derived bio-crude oil into high-quality, drop-in biofuels suitable for aviation and marine applications. This crucial step aligns with our commitment to creating sustainable alternatives to fossil fuels and driving the transition to a low-carbon economy.

The Upgrading Process

Emulsification

The bio-crude oil undergoes an emulsification process to improve its stability and homogeneity, preparing it for further refining.

Hydro-Deoxygenation (HDO)

The core of the upgrading process is hydro-deoxygenation (HDO), where oxygen, sulfur, and nitrogen compounds are removed from the bio-crude oil. This step significantly enhances the fuel's energy density and reduces its environmental footprint.

Drop-In Fuel Production

Marine Biofuel: The upgraded bio-oil meets the specifications for use as a drop-in replacement for traditional marine fuels.

Sustainable Aviation Fuel (SAF): The final product achieves high energy performance and compatibility with existing aviation infrastructure, enabling its use as a direct substitute for conventional jet fuel.

Key Features and Advantages

Higher Heating Value (HHV): The upgraded bio-oil boasts an HHV of over 40 MJ/kg, exceeding the energy performance of standard pyrolysis oils.

Environmental Benefits: The upgrading process produces deoxygenated, desulfurized, and denitrogenated bio-oils, significantly reducing greenhouse gas emissions compared to fossil fuels.

Versatility: The drop-in nature of the fuels allows seamless integration with existing energy infrastructure, reducing the need for costly modifications.

Applications

Aviation Industry: Sustainable Aviation Fuel (SAF) is critical to reducing carbon emissions in air travel and meeting global decarbonization targets.

Marine Industry: Upgraded marine biofuel provides a cleaner alternative for shipping, reducing the sector's reliance on heavy fuel oil.

Impact on Sustainability

By integrating advanced bio-crude oil upgrading into our HTL technology, we not only maximize the value of bio-crude oil but also contribute to decarbonizing two of the most

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energy-intensive industries: aviation and maritime. This technology exemplifies our vision of transforming waste into a renewable, scalable resource, enabling a sustainable future for all. With this innovation, Advanced Biorefinery Technologies Ltd. solidifies its position as a leader in sustainable energy solutions, paving the way for cleaner skies and oceans.

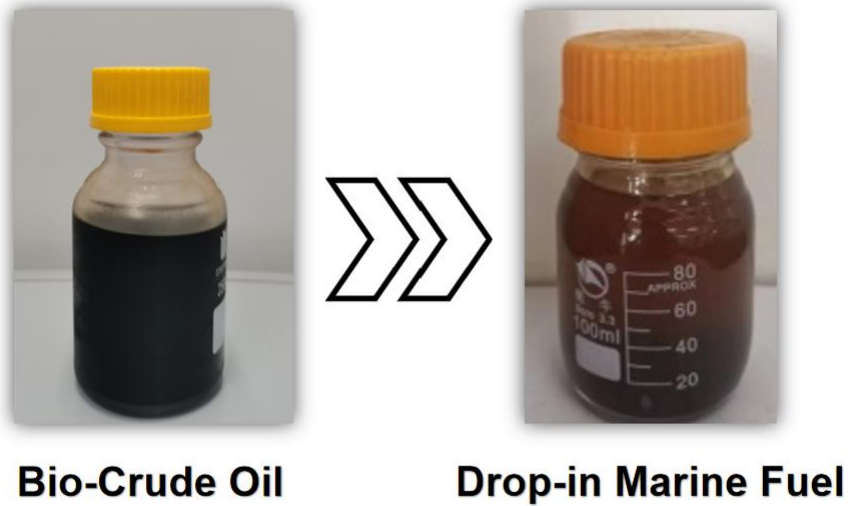


Fig. 1 Transformation of Bio-Crude Oil into Drop-in Marine Fuel

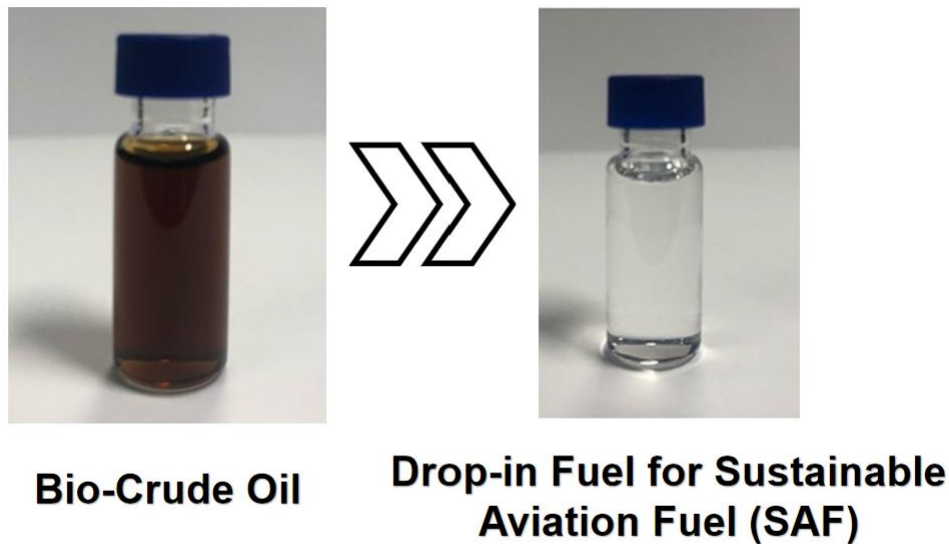


Fig. 2 Transformation of Bio-Crude Oil into Drop-in Fuel for Sustainable Aviation Fuel (SAF)