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Production of Advanced Biofuels by Hydrothermal Liquefaction of Sorted Organic Domestic Waste

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Abstract

The decline of petroleum resources combined to the increasing demand of energy by emerging economies are driving a rapid expansion of biofuels production also boosted by government mandates.

Sorted organic urban domestic wastes are potential feedstock for the production of liquid biofuels, which could be suitable alternatives to transport fossil fuels. The main characteristic of solid organic waste is the high water content, therefore a biofuel production process based on hydrothermal liquefaction (HTL) was developed. HTL is an environmentally friendly sustainable technology that allows the direct use of a wet biomass not in competition with food and without land use. The main product is a bio-oil with a heating value similar to that of a fossil heavy oil but a higher heteroatoms content (oxygen and nitrogen).

The present paper describes the bio-oil production process and how it can be directly used as advanced marine biofuel (e.g. marine bunker with low S < 1000 ppm), or can be upgraded to produce high quality automotive fuels by different strategies including hydrotreating, hydrocracking and FCC.