

# Decomposition and characterization of Aqueous Pyrolysis Liquid

**Master's thesis number:** FMH606

## Introduction and background:

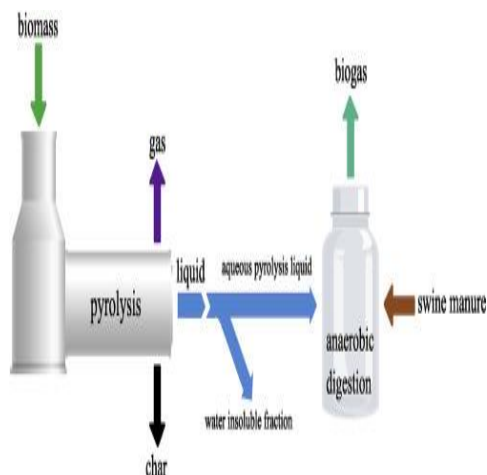
Pyrolysis is the thermal decomposition of organic matter in the absence or with a limited supply of oxygen. Solids (biochar from biomass) and gas with non-condensable and condensable components are among the pyrolysis products. Methane, hydrogen, carbon monoxide, and carbon dioxide are examples of non-condensable gases (a combination of the latter three is often referred to as syngas). The condensable fraction of the gas (condensate) is a combination of water and a variety of compounds that can have high energy content and oily properties. The condensable fraction is also known as pyrolysis liquid or bio-oil. Any condensed bio-oil should be valorized to realize the benefits of the process. Because of the water content and chemical complexity, we need to investigate decomposition processes and chemical properties to market pyrolysis products.

## Problem description and objective:

APL is not considered a fuel due to its high-water content and the presence of other complex compounds that work as inhibitors. APL can also be used as a feed for the AD process to extract as much energy as it contains, but some treatments must be carried out to prepare it as a substrate in AD.

## Specific objectives:

- Research the effect of applying a potential on the decomposition of APLs.
- Study the effect of acid treatment on the decomposition of APLs.
- Develop a procedure for evaluating the degradability of APLs.
- Determine the optimal pyrolysis temperature to produce APLs and, consequently, methane production.
- Examine FTIR as a technique for APL characterization.



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