Modelling heat treated lignocellulosic material as substrate in Anaerobic digestion

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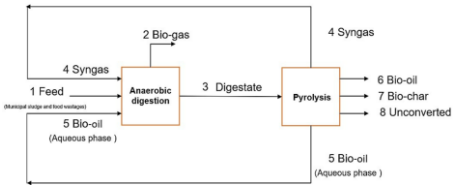
Introduction and background:

Energy and material production from lignocellulosic (wood) waste material receives increased interest as a carbon neutral economic feasible option. The master study will be carried out to gain more knowledge related to ongoing research projects in cooperation with industry. The projects aim at developing new technologies for converting various biomass waste products as lignocellulosic residue feedstocks into biogas (biomethane) transportation fuel and biocarbon material by combining anaerobic digestion (AD) and pyrolysis/gasification technology. Anaerobic digestion is a method where microorganisms mineralize organic matter, generating biogas. The biogas is an energy source due to its high content of methane. Understanding the mechanisms controlling the stoichiometry and kinetics in anaerobic digestion is important to improve the usage of heat-treated products of lignocellulosic components as lignin, hemicellulose and cellulose for transport fuel production (methane from upgraded biogas).

Problem description and objective:

Clean energy technology is quickly establishing itself as a major new source of investment and job development. Anaerobic digestion of biomass requires less capital and per unit production cost than other renewable energy sources. Pyrolysis is one of the most cost-effective and environmentally friendly technologies for biomass conversion and converts dry biomass into charcoal, syngas, bio-oil, and aqueous pyrolysis liquid (APL). By addition of APL and syngas to Anaerobic digestion we will investigate biogas production.



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