

Universität Stuttgart

Institut für Feuerungs- und Kraftwerkstechnik

Prof. Dr. techn. G. Scheffknecht

Ausschreibung

Master Thesis

Thermogravimetric Analysis of Biomass blends.

Background

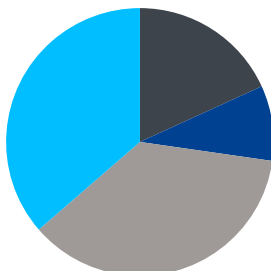
Renewable energy transition calls for alternative fuels with reliable combustion performance. Biomass is a CO₂ neutral fuel with the potential to replace coal as a primary energy source. However, biomass combustion inherently differs from coal. Cofiring of biomass and coal has been extensively studied. On the other hand, combustion behavior of biomass **blends** (e.g. Wood pellets + Sewage sludge or Wood pellets + Miscanthus) have had little research attention. Hence the objective of this research.

Process

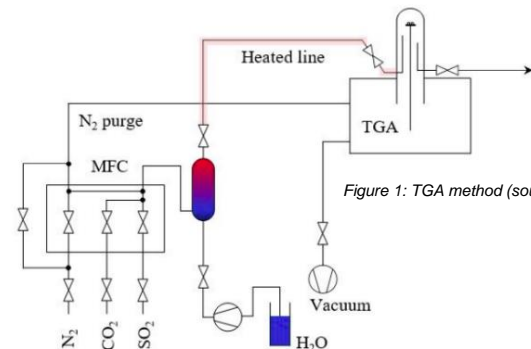
Thermogravimetric Analysis (TGA) simultaneously studies the effect of temperature and weight loss of fuel samples. The results of such test facilitate the determination of fundamental kinetic and thermodynamic parameter like activation energy and pre-exponential factors of a fuel sample under specific boundary conditions. The study to be undertaken herein will include the TGA analysis of different blends of biomass under different heating rates to help understand the combustion behavior of mixtures of biomass of different origins.

Goals and required skills.

1. Literature review on biomass in TGA
2. TGA experiment on different biomass blends
3. Results presentation
4. Finding an optimized blend ratio



■ Literature ■ Theory
■ Experimentation ■ Practical work



Requirement

- Independent and self-reliance
- Methodical work (Excellent documentation)
- High interest for experimentation
- Excellent data analysis skills
- Excel skills (Matlab, Origin are added advantages)
- Readiness to deal with solid fuels

Starting: As soon as possible!

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