Master-Thesis/Bachelor-Thesis/ADP/Hiwi

Development of a Novel Laminar Flow Reactor for Optical Measurements of Biomass Flames in NH₃-enriched Atmospheres





Date

27.06.2024

Start from

Flexible, get in touch!

Motivation & Background

As the push for sustainable energy solutions intensifies, the combustion of biomass solid fuels in ammonia (NH_3)-enriched atmospheres presents a promising path forward. This approach not only leverages renewable biomass resources but also explores the potential of ammonia as a carbon-free hydrogen carrier and fuel. To deepen our understanding of the combustion dynamics and emission characteristics under these conditions, we propose the development of a novel laminar flow reactor specifically designed for optical measurements of biomass solid fuel flames in an NH_3 -enriched atmosphere. The key features of the reactor will include:

- The reactor will be designed to maintain a stable laminar flow, ensuring consistent and reproducible combustion conditions.
- The reactor will feature multiple optical windows to allow for comprehensive diagnostic techniques.
- The reactor will be equipped with precise control systems for introducing and regulating ammonia concentrations in the combustion chamber

Tasks

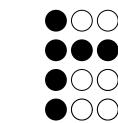
- Review the literature, especially NH3 combustion and Experiment biomass energy
- Design and construct a laminar flow reactor
- Assemble the reactor and perform experiments
- Analyze data and results
- Intermediate and final presentations, write the final thesis

Focus areas

Construction

Data analysis

Modeling



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