

## Bachelor/Master thesis- Project work

### Mass spectrometric study on biomass combustion

During the combustion of biomasses a large amount of hydrocarbons is released in the initial heat-up phase. These species (volatiles) interact with each other which determines the formation of pollutants. Liquid biofuels often exhibit similar chemical structures and behavior to these volatile species.

The goal of our team is to evaluate potential pathways for pollutants formation with a particular focus on **soot precursors** (Fig.1).

**Time-of-flight mass spectrometric** species measurements in flames are a powerful tool to investigate the formation of undesirable substances occurring in combustion processes. Just a few research groups in the world are currently able to deliver reliable and quantitative data of this kind (Fig.2).

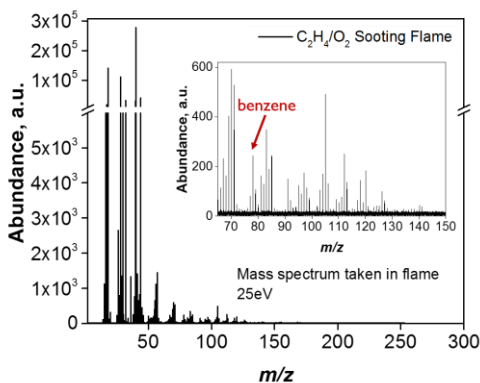


Fig.1 Mass spectrum showing the presence of a large amount of soot precursors in the flame

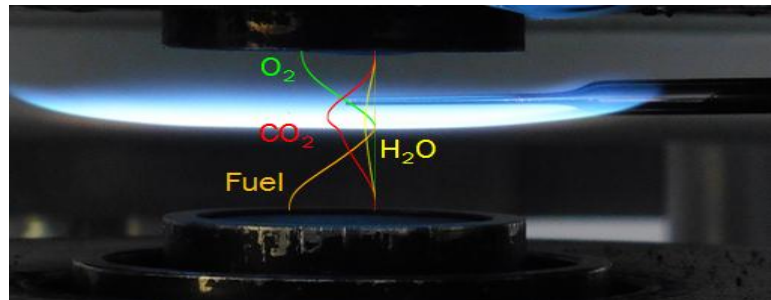


Fig.2 Flame sampling in a laboratory flame

#### Your activities:

- experimental measurements of species and temperature profiles with a Time-of-Flight mass spectrometer
- analysis of the flame structure through the use of a 1D code which simulates the flames that you measure in the lab and comparison with experimental results

#### What you will learn:

- you will gain a good understanding of the structure of a flame and of the thermal, chemical and transport processes that need to be considered

#### The ideal candidate should:

- have basic thermodynamic and combustion knowledge
- ready to work in an experimental environment

**THIS THESIS CAN BE COUPLED WITH A HiWi JOB ON THE SAME TOPIC!**

