

Master Thesis

The Institute for Combustion and Gas Dynamics–Reactive Fluids (Prof. Dr. Christof Schulz) offers an opportunity for a **master thesis**:

Experimental and numerical study on the impact of oxygenated hydrocarbons on the pyrolysis of a surrogate fuel in shock tube

Shock-tube experiments are well established for the investigation of ultra-fast reactions that are important for the development of chemical-kinetics reaction mechanisms for high-temperature gas-phase reactions like those that occur in combustion processes. In practical combustion processes, one possibility to influence soot formation is related to the admixing of additives to the fuel or the use of fuel blends. Molecular oxygen reduces the amount of condensed carbon and enhances secondary oxidation. Besides O₂, also fuel-bonded oxygen has an influence on soot formation. Therefore, studying the influence of oxygenated hydrocarbons on soot formation has a high relevance due to growing interest in the use of liquid oxygenated fuels. Within the frame of this thesis, experiments in shock tubes and simulations with commercial codes will be performed to assess the influence of different oxygenated fuel compounds on soot formation by doing experiments with gas mixtures containing a surrogate fuel and oxygenated hydrocarbons.

Requirements:

- Study of chemical engineering
- Laboratory practice
- Knowledge in combustion science and optics is preferable
- Good English skills
- Available min. 4 days / week
- Starting date: January 2022

We are seeking candidates with interest in interdisciplinary work with excellent experimental skills and high level of commitment and enthusiasm for scientific research.



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