

Project profile AmOszi

Title:

Reduction of nitrogen oxides formation by the oscillating combustion of ammonia as a carbon-free energy carrier.

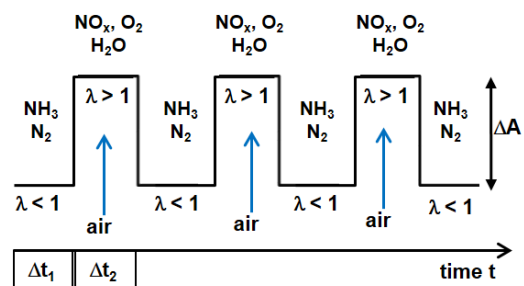
Summary:

The climate change is one of the challenges of the 21st century, whereupon the greenhouse gas emissions, particularly CO₂, released by the combustion of fossil energy sources contribute significantly to the global warming. NH₃ can play an important role, as an alternative CO₂-free fuel, along with H₂. If referred to transport volume, H₂ has a lesser lower heating value than NH₃: NH₃ is readily liquefied at 33°C and standard pressure, which makes its transportation considerably easier. From the economic point of view, the expenditures and the flue gas treatment are especially relevant. By the combustion of NH₃ higher NO_x emissions have to be considered. In order to avoid costly investments in flue gas post-treatment processes (DENOX), such as SCR-catalysts all primary measures must be fully utilized.

Typical NO_x-reduction primary measures with

NH₃ fuel have to be examined by the means of reaction kinetics investigations, CFD-simulations and experimental studies on a semi-industrial scale and consequently compared with oscillating combustion.

The obtained results will be transferred on true industrial plants. Furthermore, the economic efficiency of the corresponding process chains in the different fields of application will be investigated too.



Aims:

- Aim of the project is to evaluate the profitability of combustion of NH₃ under further development and application of oscillating operation mode for NO_x-reduction, along with a comprehensive survey of NH₃ supply, transportation and storage.
- This study is of particular interest for the SMEs (small and medium-sized enterprises) participating in the project, as well as for other companies, since it allows future decisions concerning investments in ammonia technology.

Funding organization: 

Partner:

Gas-Wärme-Institut (Project management)

Duration: 01.06.2021 - 31.10.2023