Opportunity for Master Thesis Project at Energy Technology on the topic of:

Plastic waste recycling via gasification-Influence of operating conditions on product distribution

Background of the project.

As society has steadily increased the use of plastics, plastic waste management has become a growing concern around the world. The durability and diverse use of plastic contribute to significant waste management and environmental problems. Moreover, plastics are mainly made from petrochemical feedstocks which leads to a reliance on fossil fuels.

For a sustainable environmental and socioeconomic future, plastic recycling is essential. In 2016, 27 million of tones were collected in Europe and only 30% was recycled. Additionally, the China import ban could affect up to 40% of that recycled plastic. A stricter quality requirement distresses largely mixed and low value plastic that currently can only be landfilled or incinerated.

In this context, gasification is an interesting option for plastics waste recycling. This thermochemical process enables the conversion of a wide range of carbonaceous feedstocks into energy vectors (e.g. H_2) and hydrocarbons (e.g. CH_4, C_2H_4). Therefore, gasification can lead to the recovery of a waste stream into valuable hydrocarbons that can be reintroduced in the chemical/petrochemical processes.

Aim of the project.

The composition of the gas derived from gasification is highly dependent on the operating conditions and the type of feedstock used. Hence, it is of interest to understand the chemistry related to the thermochemical conversion of plastics. In this Master thesis you will investigate the reactions involved in the thermochemical conversion of plastic compounds and the relation between products obtained and operating conditions. A model plastic compound such as polyethylene can be chosen to develop this understanding. In addition, the present recycling challenges and/or potential use of the gasification products could be also examined.

Where and who to contact

This Master Thesis will be developed at the Division of Energy Technology. If you are interested in the subject, like challenges and value independent work, come and talk to us!

Contact person: Teresa Berdugo Vilches

Find me at: Energiteknik
M-building
4th floor