

Vak: Lab BioFuels

credits: 2

Vakcode ZVWH15UB
Naam Lab BioFuels
Studiejaar 2020-2021
ECTS credits 2
Taal Engels
Coördinator -

Werkvormen Werkvorm 1
Toetsen Bioenergy Conversion Lab BioFuels -
 Opdracht

Leeruitkomsten

To have demonstrated knowledge and understanding of:

- Chemistry to calculate the thermodynamic outcome of various (bio-) chemical reactions
- Thermodynamic and kinetic basics of different thermochemical conversion technologies
- Broad variety of (lignocellulosic) biomass feedstocks and energy carriers, based on their origin (woody/non-woody), chemical composition as well as physical properties
- Distinguishing the many choices in biological and thermochemical conversion processes
- The practical challenges that influence availability and reliability of a biochemical conversion plant
- The practical challenges of various thermochemical conversion technologies (pyrolysis/gasification/combustion) and based on various technical designs (fixed/fluidized bed/pulverized fuel), including general characteristics in terms of scales, emissions and system efficiencies
- Unit operations that are required for a given biochemical and thermochemical process

To be able to

- Make mass and energy balances in biological and thermochemical conversion processes
- Set up a biological conversion experiment (e.g. anaerobic digestion or photo bioreactors)
- Model a biofuel production plant and calculate energy conversion efficiencies
- Recognize different types of biomass feedstock and upgraded biomass energy carriers
- Select a suitable thermochemical conversion process, based on biomass/feedstock chemical composition and physical properties

Contribute to discussions with experts

Inhoud

- General aspects of working in a biological laboratory (safety issues, lab notebook)
- Handling of analytical equipment.
- Setting up an fermentation experiment, using various types of biomass (lignocellulose, starch, etc.) as source of glucose (via pre-treatment techniques).
- Using bacteria (*Zymomonas mobilis*) and yeast (*Saccharomyces cerevisiae*) as biocatalysts for ethanol production.
- Writing a scientific report.
- Efficiency calculation on the yield of glucose and ethanol.
- Data handling.
- Combining the obtained results with respect to the metabolic considerations of bacteria and yeast.
- Reflecting obtained results on peer reviewed scientific articles.

Opgenomen in opleiding(en)

European Master in Renewable Energy

School(s)

Instituut voor Engineering