TECHNISCHE UNIVERSITÄT WIEN

technology offer

# Improving methanogenesis by pervaporation

Renewable energy | bioprocess | retention of biomass AND media | membrane separation

CO2 neutral energy production processes is a key topic in energy policies. Bioprocesses like biological methanogenesis are characterized by a simultaneous production of water that constantly needs to be removed. Selective water removal using pervaporation will retain biomass and media components in the fermentation broth and therefore reduce media costs and enhance process performance.

## Background

During biological methanogenesis a constant removal of produced water is needed. State of the art is the removal of fermentation broth. This leads to losses of biomass and therefore catalytic activity, slowing down the process. Media components like salts, trace elements and vitamins are removed as well and have to be added again, at high costs. The problem to solve was to find a technique for selective water removal, retaining biomass and media components.

## Technology

The technology comprises:

- Membrane based separation technique
- Selective water removal
- Simultaneous retention of biomass and media components
- Applicable in a bypass or inside the reactor

## Advantages

- Catalytic active biomass is increased
- Process performance is enhanced
- Costs of media components are reduced
- Costs for waste water treatment are saved
- A sustainable and environmentally friendly production process is improved

## Potential applications

Biological methanogenesis is one of the most promising technologies for the production of biomethane and renewable electricity storage.

The technology is especially suited for all bioprocesses that are accompanied by a simultaneous production of water, continuous anaerobic processes and catalytic processes with low biomass production rates.

*Fig. 1: Bioreactor for biological methanogenesis process*

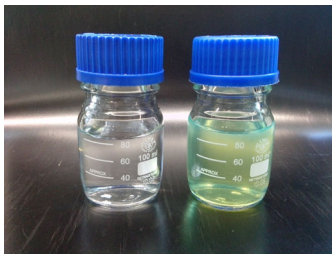

*Fig. 2: Usual waste contains valuable biomass and media components, this technology produced clear permeate = water*

## State of development

Proof of concept and quantification of process performance with continuous cultures of M. marburgensis at 10 L scale

## IPR Status

Patent lapsed

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