Power-to-gas in Biologischen Blasensäulen

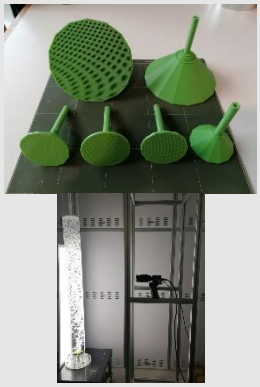
JOHANNES KEPLER UNIVERSITY LINZ

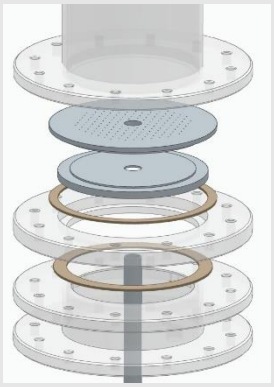
Bachelor-/Master thesis

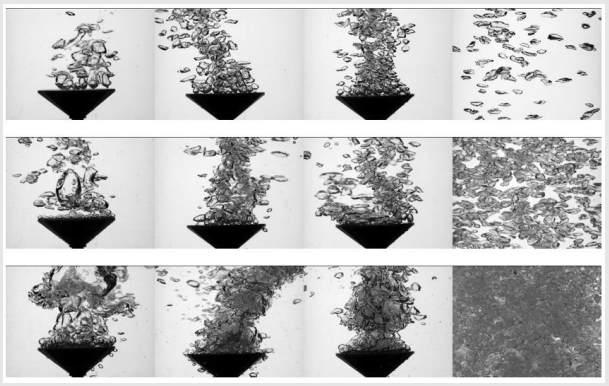
Research Topic

Power-to-gas aims to provide technologies for the energy future that are capable of storing renewable energies efficiently. One of this methods is methanisation of the greenhouse gas CO_2 and electrolytic hydrogen, since methane has great energy values and good storability. In addition to catalytic methanation, the focus is shifting to biological methanation using archaea. In this process, methanation takes place at comparatively low temperatures. The frequently used stirred tank is well researched, but has severe downsides, like additional energy input and low mass transfer.

In bubble columns, on the other hand, mixing of the solution takes place due to the resulting hydrodynamics. The design of bubble columns is simple, but the existing correlations are not completly researched and understood.







Possible tasks

- Construction, modification and further development of the bubble columns and their sensors.
- Development/Design of disperser
    - Digital modeling
    - 3D printing
- Investigation of the temperature and viscosity influence on the system.
- Investigation of the disperser influence on the bubble column:
    - Bubble size/distribution
    - Gas hold-up
    - Mass transfer
- Comparison of the bubble columns and correlation determination (Scale-up effects!)
- Evalutaion of the sensors and optical data

More infromation from Florian Klapal

Mail: florian.klapal@jku.at

Institut für Verfahrens-technik