Research group Membrane Materials and Processes

Technische Universiteit Eindhoven University of Technology

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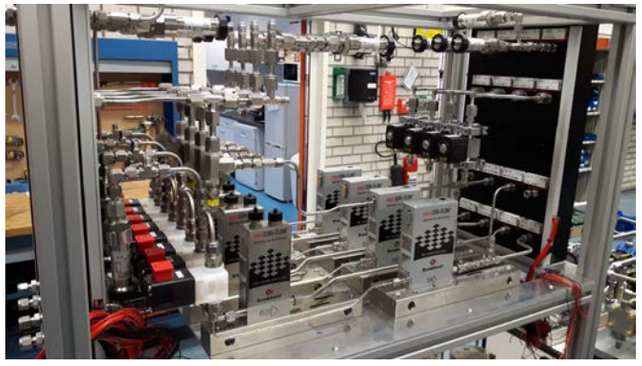
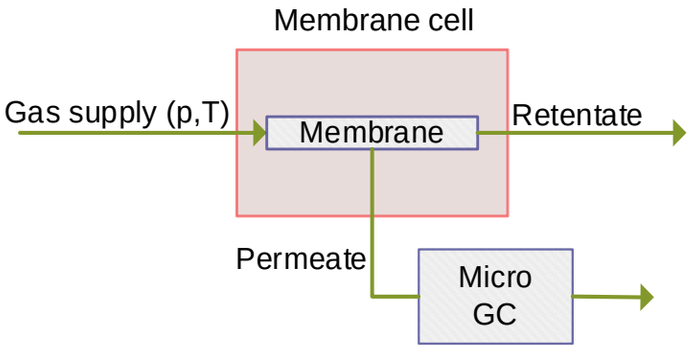
Gas Permeation Pilot

Convergence, Inspector Mixed GP “Titan”

Introduction

Gas permeation is the transport of gas molecules through a membrane material. The permeability and selectivity are the key characteristics to describe the membrane performance. The purpose of the gas permeation pilot is to measure both the permeability and selectivity of pure as well mixed gasses at various temperatures, pressures and flow rates.





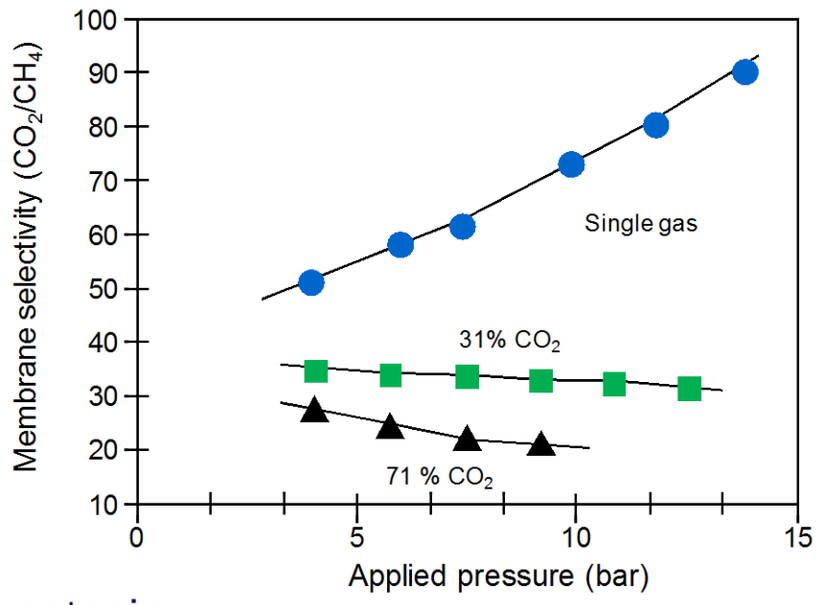
Principle

Gas is supplied to the membrane cell at a set temperature, pressure and stage cut. In the membrane cell selective transport of the gasses occurs. Using single gasses the permeation rate is calculated by the pressure decay method. In case of mixed gasses the permeation rate is calculated based on the analyses of the feed and permeate using a micro GC-analyzer.

Advantages of this system

- Highly flexible and compact
- Possibility to measure 4 membranes simultaneously
- Suitable for hollow fiber and flat sheet membranes
- Single and mixed gas measurements incl. CO and H_2S
- High temperature and high pressure measurements
- Pressure decay or sweep gas method

CO_2/CH_4 mixed gas selectivity measurements, plasticization effect.



Applications

- Natural gas sweetening
- Biogas upgrading
- CO_2 conversion to fuels and chemical building blocks
- O_2 /N_2 separation