

Gas Permeation

Overview:

Efficient gas separation techniques are of interest for numerous industrial sectors. Hydrogen purification and recovery, natural and biogas sweetening, gas dewatering, carbon dioxide capture, and the separations of olefins and paraffins are just a few of the gas separations applications that can be accomplished using membranes.

This test bed enables the testing of numerous membrane platforms (inorganic, polymeric, flat sheet, hollow fiber, tubular) at industrially relevant conditions.

Description of the test bed:

- The test bed is currently set up for testing single channel inorganic **membranes** with a length of 100 mm and 250 mm and outer diameter of 10 mm and inner diameter of 7 mm (system adaptable to other membrane configurations). Additional membrane geometries and configurations can be tested with other test cells.
- **Working pressure:** max. 10 bar (150 psi) - second system planned for 2020 to operate at 69 bar (1000 psi)
- **Working temperature:** Room temperature to 300 °C (investigating ability to expand to 800 °C)
- **Gases:** He, N₂, SF₆, O₂, CO, CO₂, H₂, CH₄ (other gases possible)
- **Analysis system:** Binary gas analyzer (gas chromatograph available 2020)

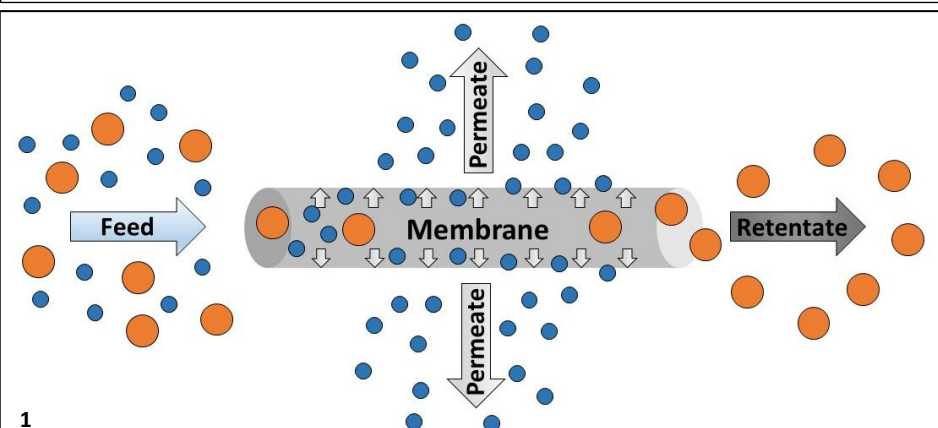
Services offered:

- Application testing for membrane processes
- Membrane characterization
- Development of gas separation membranes and processes
- Delivery of membrane prototypes
- Assembly of bench-scale and pilot-scale permeation plants



1 Separation of a binary gas mixture through a membrane in single channel geometry (schematically).

2 Gas permeation test rig at CEI laboratory which is actually equipped with a module for single channel substrates.



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