

Hybrid-silica membrane modules



Test modules containing a novel pervaporation membrane with high hydrothermal and acid stability

Recently, ECN has developed in collaboration with the universities of Twente and Amsterdam a new pervaporation membrane which provides a step improvement in the hydrothermal stability. Currently, ECN offers this membrane including an easy to install lab test module to interested parties.

The hybrid-silica membrane

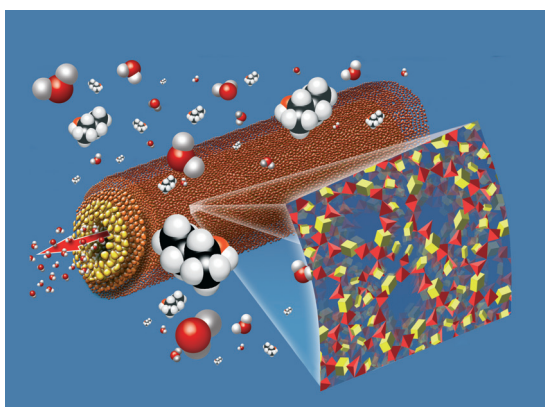
A break through has been achieved in the hydro-thermal stability and thus the applicability of molecular selective membranes.

This improved stability has been achieved by partially replacing some of the Si-O-Si bonds in pure silica by Si-CH₂-CH₂-Si bridges. This unprecedented stability is combined with very high fluxes and selectivity. The main features in terms of performance an applicability of this new membrane are:

- Suitable for the dehydration of a wide range of organic solvents e.g. MEK, NMP, THF, and alcohols.
- Also methanol can be removed selectively from organic solvents.
- Applicability proven up to 150°C for two years, and even at 190°C a stable performance for more than months have been determined.
- Very high water fluxes and selectivities, which are dependent on the specific process and temperature.
- Acid resistant to e.g. 10⁻³ mol HNO₃/l at 95°C. Further application window is being determined at this moment.



Module with 100cm² of membrane surface area



Artist impression of the hybrid membrane system

Products

- Single tube hybrid membrane according to patent WO2007081212, with surface area of 100 cm².
- ECN module including membrane – metal housing seal, according to patent EP1128118 at appropriate length (appr. 25 cm), with Swagelock connections to feed, retentate, and permeate; T_{max} = 200°C, P_{max} = 15 bar.
- Quality pre-tested.
- Technical Information Package.

For further information: www.hybsi.com