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Datasheet

TUBULAR POMS MEMBRANE

Tubular POMS (polyoctylmethyl siloxane) membranes have organophilic (hydrophobic) characteristics, which means that the organic constituent of the feed passes preferentially through the membrane.

MEMBRANE ELEMENT

Geometry	Tubular
Dimensions	1-channel tube 250 x 10 x 7 mm, effective membrane surface area 0.005 m^2
	1-channel tube 500 x 10 x 7 mm, effective membrane surface area 0.010 m^2
External diameter tolerance	10 mm + 0.5 mm / - 0.0 mm
Substrate material	α-Al$_2$O$_3$
Top layer	POMS
Coating position	Inside of the tube

OPERATIONAL WINDOW

Temperature	Maximum 70 °C (short-term 80 °C)
Pressure	Maximum 10 bar
pH	3-10
Pre-filtration	10 µm cartridge filter

CLEANING OF POMS PERVAPORATION MEMBRANES

Cleaning in aqueous environments requires special care. This is to keep elements (more or less) free from microorganisms. In case you are processing food products, starch or other carbohydrate-containing sources like juices, wine or (soybean) milk, take extreme care to clean your element during and after experiments! Cleaning best can be done by rinsing the membranes with RO water.

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In case of complex mixtures this may not be sufficient, and you could apply the following procedures:
- 0.05 wt% sodium hydroxide at 40 °C for 30 minutes, then rinse with RO water
- Ethanol or ethanol solutions (>25 wt%)
- Rinse with hot water (max. 90 °C) to remove e.g. waxes and fats and to kill microorganisms
- Enzymatic solutions: depending on the feed (after that rinse with RO water)
- Mild hydrogen peroxide solutions (0.5 wt%) (after that rinse with RO water)

- Please contact us for support!
- _Avoid detergents since they may affect the surface chemistry of the membrane_

STORAGE
After use, rinse thoroughly with RO water.

Short term storage
After rinsing with clean RO water, rinse with 0.25 wt% sodium metabisulphite ($Na_2S_2O_5$) or with >10 wt% ethanol in water. Rinse for at least 30 min and keep the membranes wetted with this solution for storage. For prolonged storage (>2 weeks) $Na_2S_2O_5$ or ethanol should be repeated.

Long term storage
Soak element in a 0.7 wt% benzalkonium chloride in RO water solution. Glycerin should not be used for storage of these membranes.
The membrane module should not get dry. It should be stored in the closed pressure vessel (use the supplied stoppers for that) at a temperature below 20 °C. Never keep the membrane in full sunlight.

After storage, and before re-use, carefully rinse with RO water. First permeates may have contamination or non-standard compositions and should not be used for application tests. Typically, stable operation is reached after approx. 2 hours, provided that temperature, vacuum and crossflow are under control.

EXAMPLES OF APPLICATIONS WITH TUBULAR ORGANOPHILIC (HYDROPHOBIC) POMS MEMBRANES

- Recovery or extraction of organics (in biotech or biotech-related food applications) from natural feed streams like fruit juices, wine, beer, coconut oil, essential oils (carvone, limonene) and in combination with fermentation
- Removal of ethyl alcohol (and other alcohols) from wine and beer
- Upgrading of reverse osmosis permeate in juice production
- Combination with bioreactor in production of alcohols (ethanol, IPA, butanol), ABE (acetone, butanol, ethanol), aldehydes, flavor production as well as acid production.
- Removal of volatile organic compounds (VOC)

In general, POMS membranes are more open than PDMS membranes. However, in some solutions, especially >>C2 and low concentrations, POMS performs better than PDMS. This especially holds for phenolic types of molecules.

Typical example of pervaporation (PV) process in combination with bioreactor:
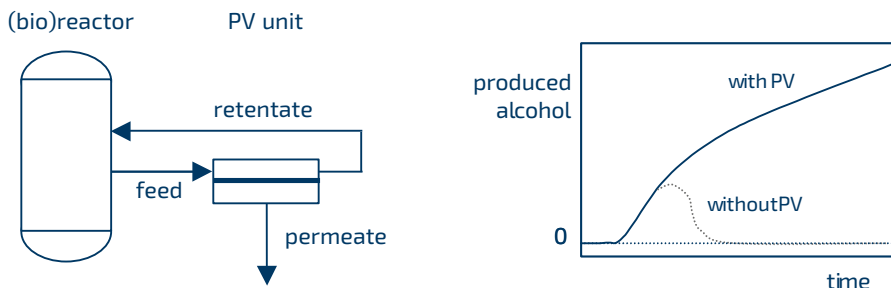
The image shows the principle of a membrane reactor for continuous product recovery (alcohols, aromas). The system with pervaporation continuously produces alcohol while other systems stop when inhibiting amounts of alcohol (or another inhibitor) have been reached. In some cases, a pretreatment is necessary.

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