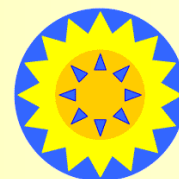


Solvent Recovery using SolSep Nanofiltration Elements

SolSep BV
Solutions for Separations



Solvent Recovery

In many chemical processes strong solvents like chlorinated solvents or a-protic solvents play an important role. Despite efforts to substitute these media by more environment-friendly ones they often cannot be replaced straightforwardly or at least not without altering the (down-stream) process.

SolSep explored routes to use membranes in a-protic solvents in industrially relevant processes.

Solvents

-THF and perchlorinated solvents (PER).
Used membranes: SolSep NF 010206, NF 030705 and NF 080105².

-NMP, DMF, DMAc. Used membrane: SolSep NF 010206S

After flat sheet experiments with spiral wounds were done. Results are shown here.

Conclusion

SolSep membranes can be used successfully in aprotic solvents and are stable and effective for a long time.

Membrane Performance

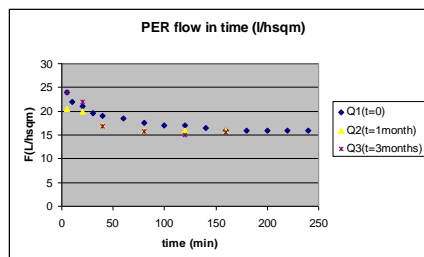


Figure 1. Characteristic data in PER of SolSep NF030705. Measured "calibrated" PER with 300Da 3% target (R=90%) at start and two intervals.

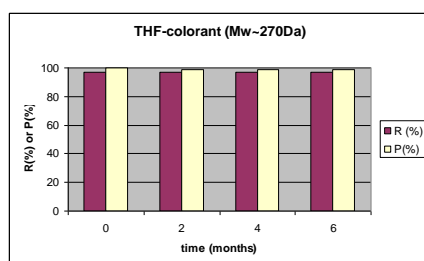


Figure 2. Characteristic data in THF of SolSep NF010206. Measured off-line.

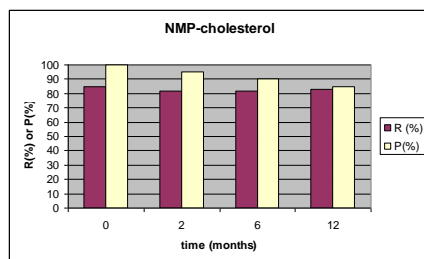


Figure 3. SolSep NF010206S behavior in NMP in time. Measured off-line of pilot trials.

SolSep Membranes & Spiral Wound Elements

Solvent systems	Ultrafiltration			Nanofiltration				
	010104	010706	010306	010206(S) ¹	030306	080105 ²	030705	030306F
Alcohols	X	X	X	X	X	X	X	X
Esters	X	X	X	X	X	X	X	X
Ketones	X	X	X	X	X	X	X	X
Aromatics	X	X	X	X	X	X	X	X
Chlorinated			X	X	X	X	X	X
Red.Atmos.			X	X	X	X	X	X

Increasing retention of small molecules

1: S is stabilized version for NMP, DMF etc., 2 mainly used for decolorization

Element S* (m²) Size (diameter x length)

SR-1	1 - 1.8	60 mm x 505 mm 2.5" x 20"
SR-2	1.5 - 3	60 mm x 1010 mm 2.5" x 40"
SR-5	5 - 8	102 mm x 1010 mm 4" x 40"
SR-20	15 - 20	195 mm x 1010 mm 8" x 40"

*Filtration area S depends on spacer thickness

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