Use of SolSep membranes in strong solvents

Proof of robustness in chemical and petrochemical industries

Project: CS-01-01
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Budget: 50 k€
Duration: Successfully completed

Incentive

Make separation of high value products from organic solvents more efficient, mild, and work at low temperature.

Thus:

- Establish better product quality
- Gain process flexibility
- Use less energy
- Design safer processes

Objective

Demonstrate the robustness of SolSep nanofiltration membranes in strong organic solvents on industrial relevant systems.

Approach

SolSep NF membranes (polymeric) were evaluated. Their performance regarding flux and retention in relation to process phenomena like fouling and concentration polarization was monitored.

Seven different systems were evaluated. This included solvents like acetone, aromatic C8- C11 mixtures, methanol, toluene, THF, toluene, MBTE , benzene and NMP.

The Solsep membranes were robust in all solvents. Pilot work was done in the NMP-cholesterol (model) system.

Testing involved lab scale experiments to determine basic performance data.

On the base of these the partners determined which systems should be tested on pilot scale.

Results

- SolSep membranes and elements are stable in all systems investigated.
- A pilot with NMP-cholesterol was successfully performed for 6 months. In other a-protics it works as well.
- Fouling and CP effects were not significant.
- Results proof the technical possibilities. Work on non-model systems should be done to validate the economics.
- Scale up for DMAc-pyridine system (France).