

Membrane Separations

- Comparison between modular configurations.

Parameter	Module		
	Tubular	Spiral-wound	Hollow fiber
Specific surface area (m^2/m^3)	300	1000	15000
Inside diameter or spread (mm)	20-50	4-20	0.5-2
Flux (L/m^2 day)	300-1000	300-1000	30-100
Production (m^3/m^3 per module & day)	100-1000	300-1000	450-1500
Space velocity (cm/s)	100-500	25-50	0.5
Pressure loss (bar)	2-3	1-2	0.3
Pretreatment	Simple	Medium	High
Plugging	Small	Medium	Elevated
Replacement	Easy	Difficult	Impossible
Cleaning:			
Mechanical	Possible	Not possible	Not possible
Chemical	Possible	Possible	Possible

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- Comparison between modular configurations.

Modular configurations and processes.

Operation	Module		
	Tubular	Spiral-wound	Hollow fiber
Reverse Osmosis	A	VA	VA
Ultrafiltration	VA	A	NA
Microfiltration	VA	NA	NA
Pervaporation	A	VA	VA
Gas Permeation	NA	VA	VA

VA = Very appropriate; A = Appropriate; NA = Not appropriate

Membrane Separations

- Material:

- Organic.

- Made of polymers or polymer blends.

- Low cost.

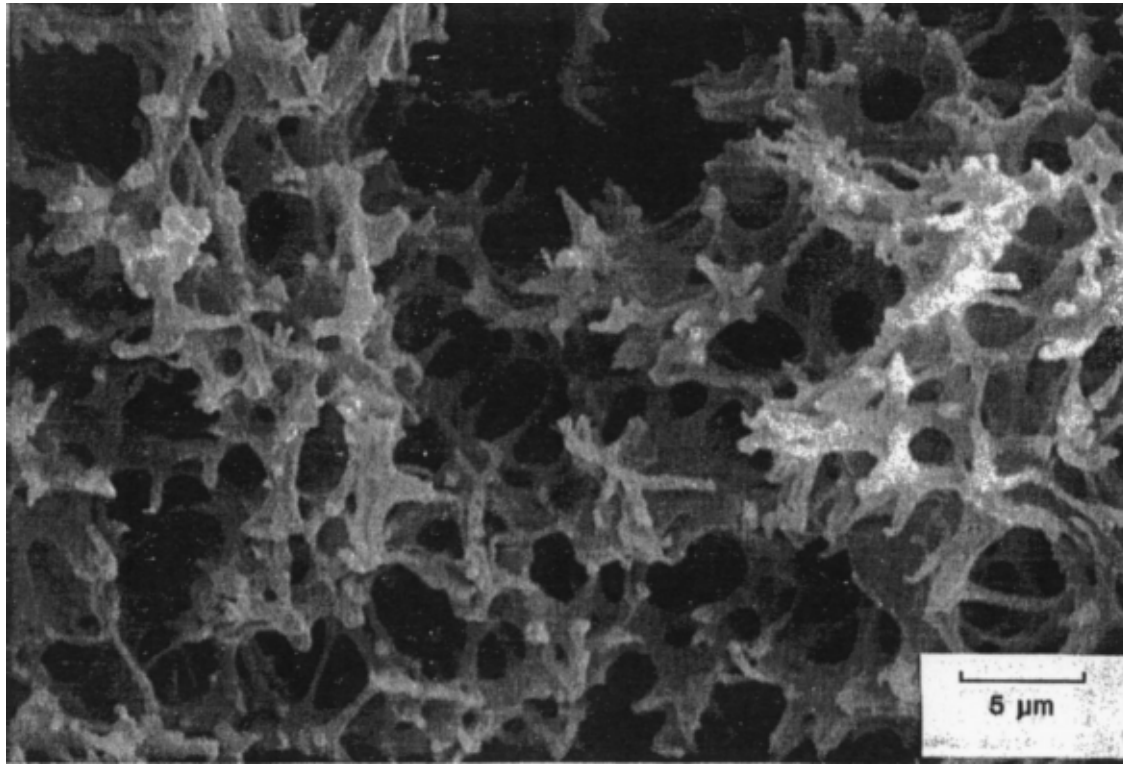
- Problems with their mechanical, chemical resistance.

Temperature

pH, Solvents

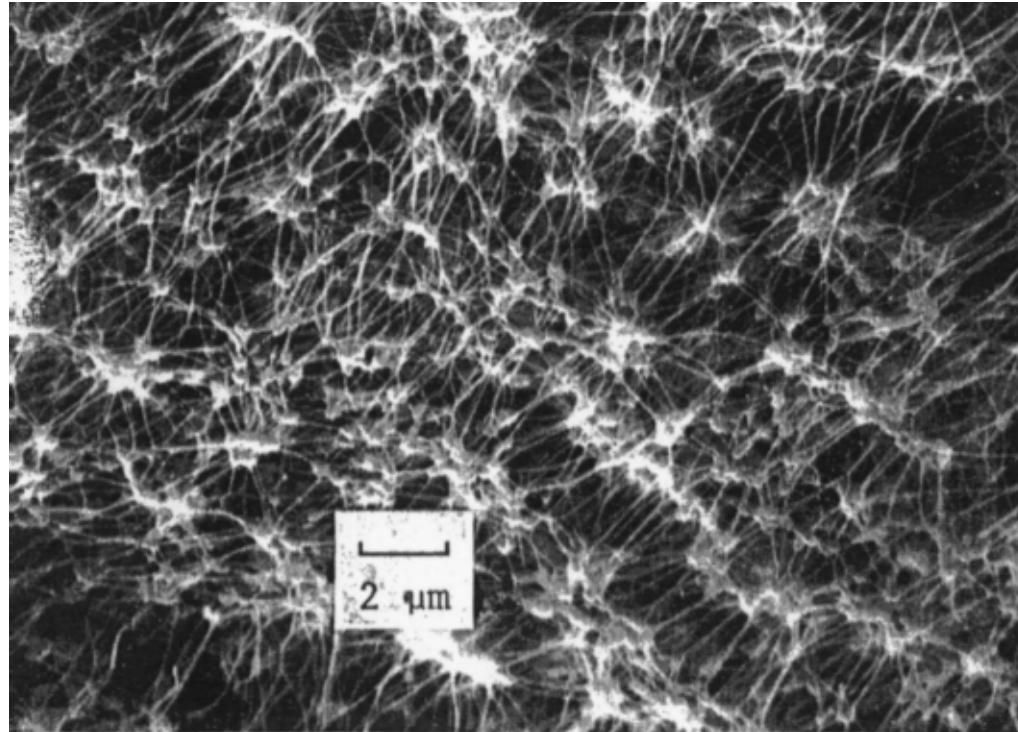
Pressure

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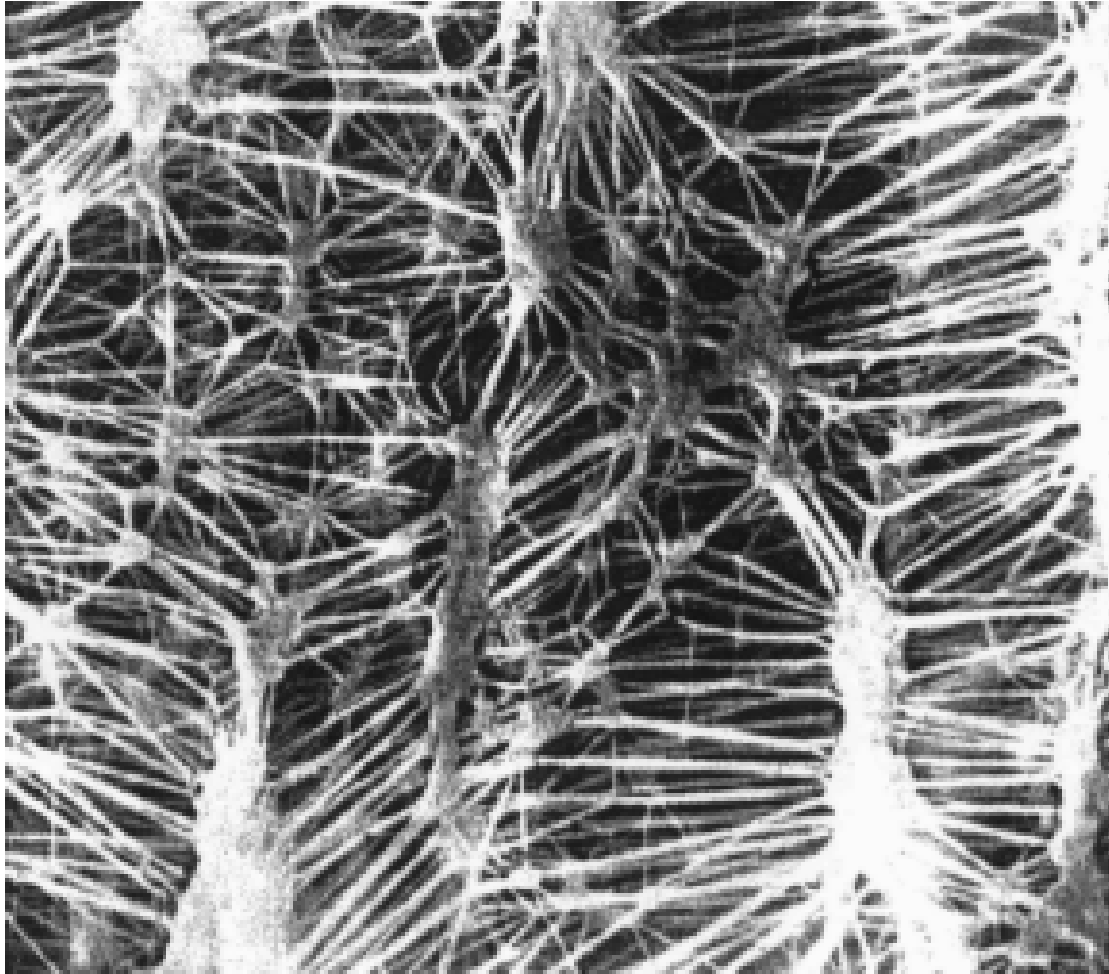
Polypropylene with 0.2 μm pores (Accurel).

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Polytetrafluoroethylene with 0.2 μm pores.

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Polytetrafluoroethylene with $0.2 \mu\text{m}$ pores.

