Membrane Separations

- Material:

  • Organic.

  - Made of polymers or polymer blends.

  - Low cost.

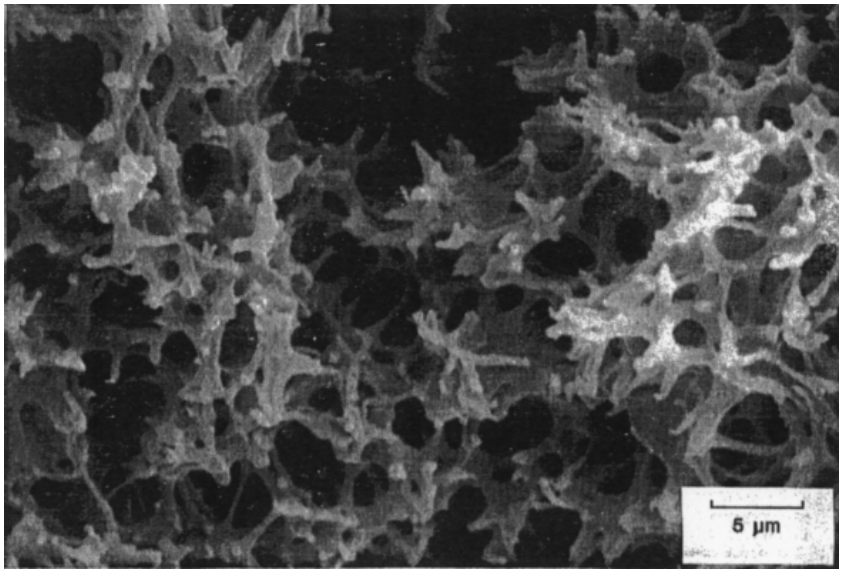
  - Problems with their mechanical, chemical resistance.

    Temperature

    pH, Solvents

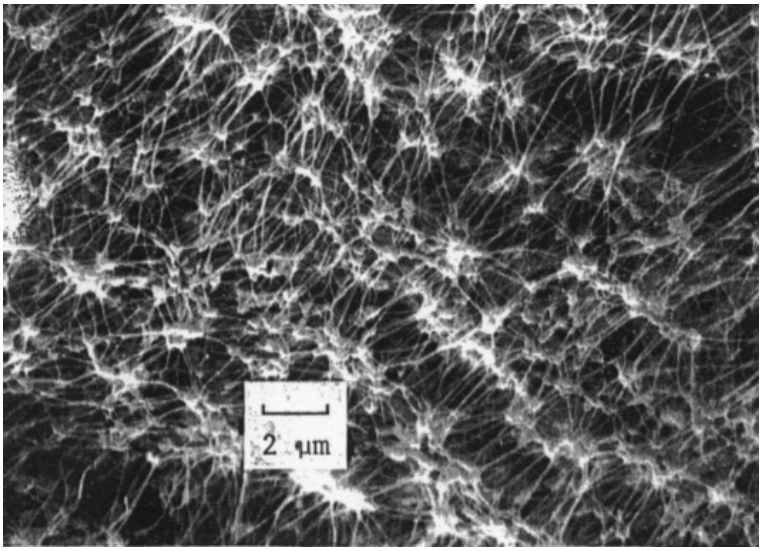
    Pressure

Membrane Separations



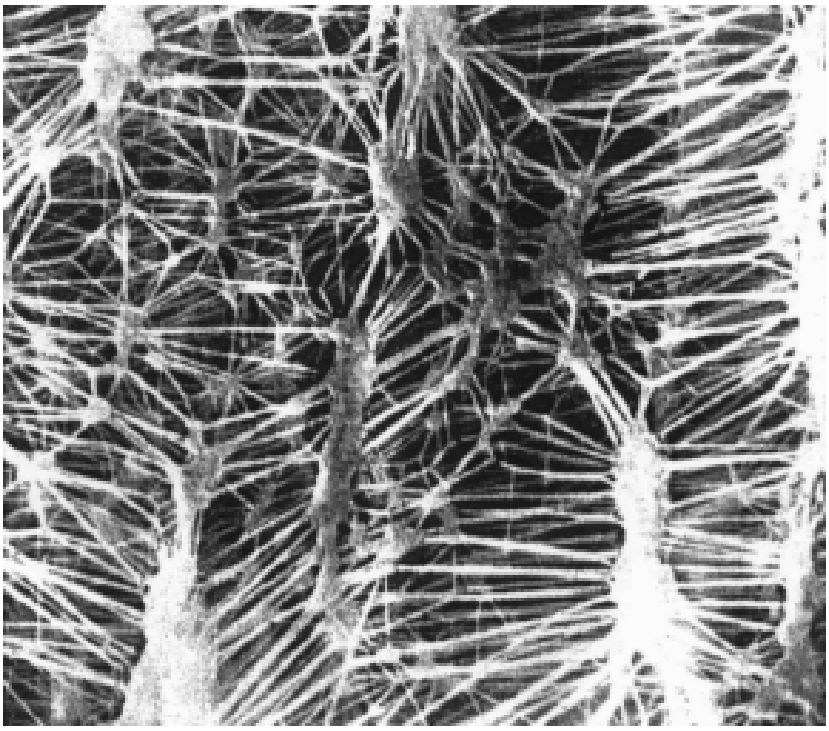
Polypropylene with 0.2 µm pores (Accurel).

Membrane Separations



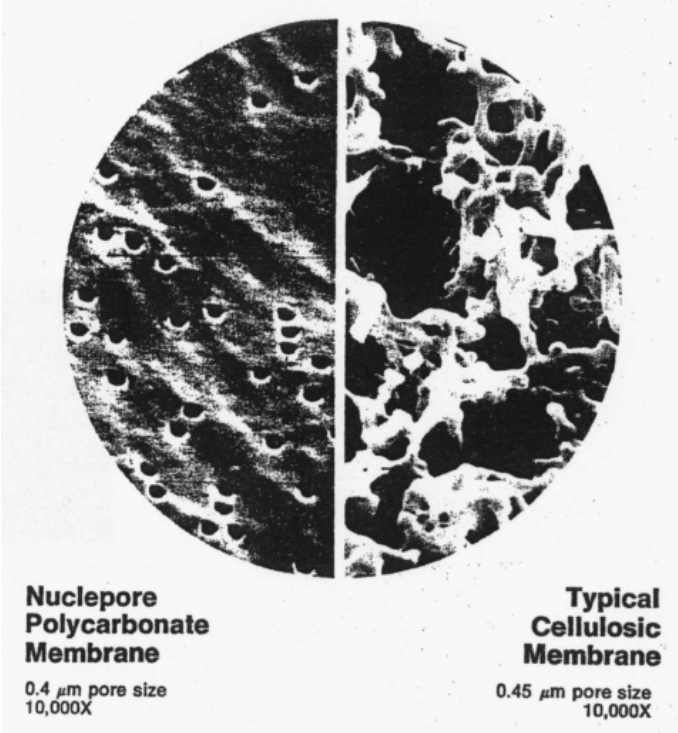
Polytetrafluoroetylene with 0.2 µm pores.

Membrane Separations



Polytetrafluoroetylene with 0.2 µm pores.

Membrane Separations



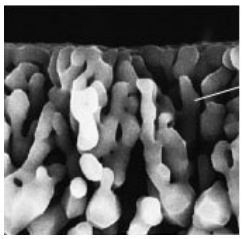
Polycarbonate with 0.4 μm pores (Nuclepore) and cellulose acetate with 0.45 μm pores.

Membrane Separations

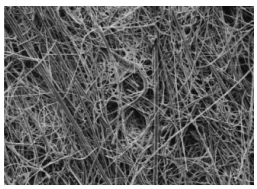
- Material:

  • Inorganic.

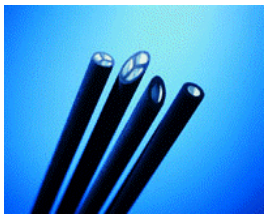
Alumina



Glass fiber

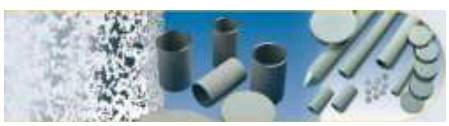


- Mainly made of metal oxides (ceramics) such as silica, alumina or oxides of Titanium, Zirconium or Magnesium.

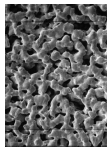


Carbon

- As well in glass, carbon or metal.
- Expensive (5 to 10 times).
- High chemical resistance and withstand high temperatures.
- Low selectivity.
- Breakable.



Metal

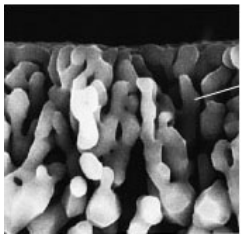


Silver membrane

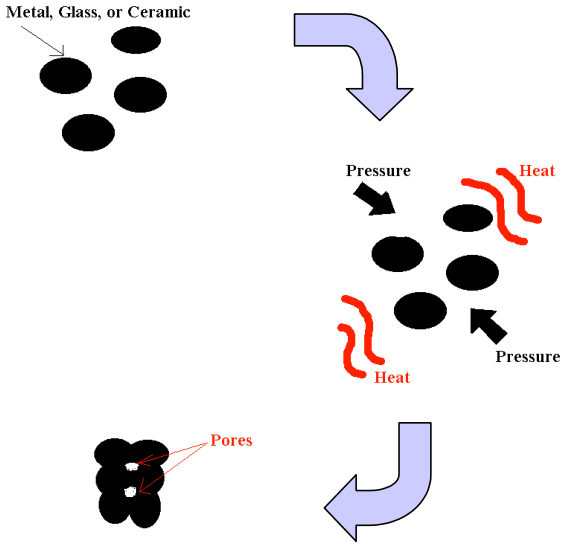
Membrane Separations

- Preparation of synthetic membranes:

Sintering-fusion



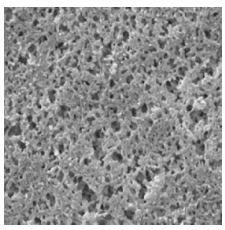
Alumina



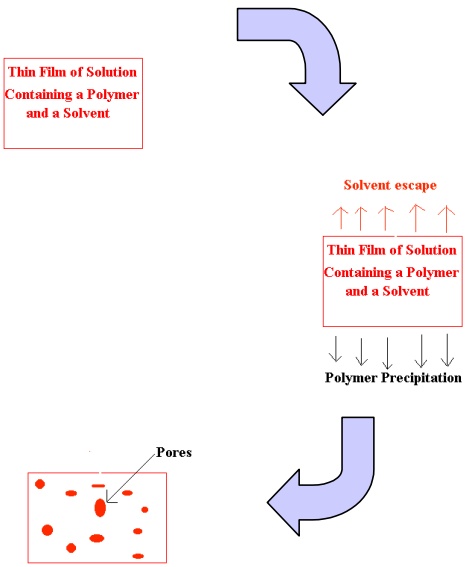
Membrane Separations

- Preparation of synthetic membranes:

Casting



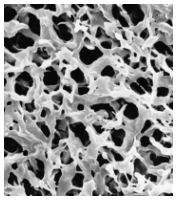
Nylon



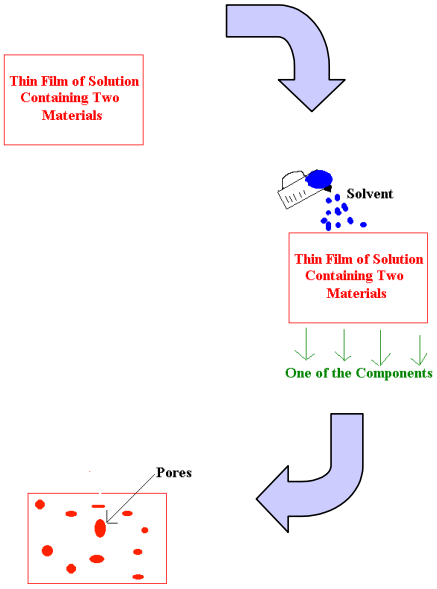
Membrane Separations

- Preparation of synthetic membranes:

Leaching



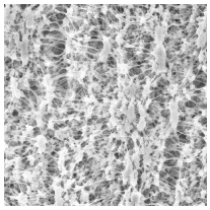
Polyvinylidenefluoride



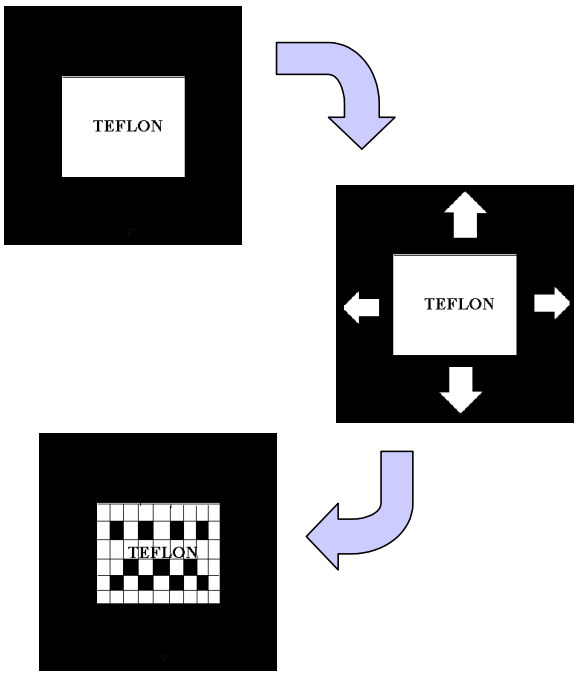
Membrane Separations

- Preparation of synthetic membranes:

Stretching



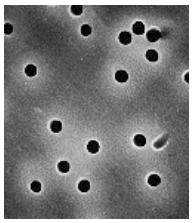
PTFE
(Polytetrafluoroethylene)



Membrane Separations

- Preparation of synthetic membranes:

Nucleation Track



Polycarbonate