

2.2 Drinking water produced through ultrafiltration



How would you produce drinking water from unsafe water?



In order to produce drinking water from natural water sources (rivers, lakes, etc.), pathogens such as bacteria and viruses have to be removed.

If these pathogens are not removed, they can cause dangerous diarrheal diseases.

What drinking water production methods are you familiar with and how do they work?



Set up:

- hollow fibre membrane
- cups 200 ml
- syringe 10 ml
- clay
- one-way cock
- teaspoon

1. To moisten the ultrafiltration membrane, use a syringe to rinse about 10 ml of water through the membrane.
2. Now close the one-way cock at the end of the membrane and use the syringe to carefully push dirty water into the hollow fibre membrane.
3. Observe the surface of the membrane.
After filtering about 50 ml of dirty water, open the one-way cock and rinse out the solids from the hollow fibre membrane with dirty water.



Observing and documenting:



Use the drawings on page 2 to explain the function of an ultrafiltration membrane.



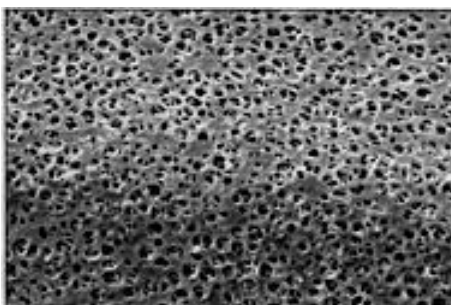
- How would you use a multimeter to check whether the ultrafiltration membrane also filters dissolved salts out of the water?
- How can you improve the system to get the daily requirement of 2 litres of safe water?
- People in Africa knew how to produce safe water from unsafe water with a piece of sugar cane. How can this work?



A small startup company would like to produce bottled water and sell it in the market at a reasonable price. The company is looking for a suitable technical solution. What would you advise the company?

Part of ultrafiltration membrane

The diameter of the pores of an ultrafiltration membrane is 20 nm.



Size of pores 10 nm

Size of other pathogens:

Bacteria	1100 nm
Poxvirus	300 nm
Herpesvirus	150 nm
Poliovirus	30 nm