Exercise 1

A porous membrane with a total pore surface area of **A = 0.05 m^2** separates two compartments containing *sucrose* at concentrations of **0,5** and **0,2 mol/L** respectively. These concentrations are maintained constant during the diffusion of sucrose molecules through the membrane. The established steady state is assumed.

- What is the value of the flow rate?

Given: **$D_{sucrose}$ = 8.10^{-10} m^2/s, $\varepsilon_{membrane}$ = 10 µm**.

Exercise 2

Let a porous membrane with a thickness e and a surface area of 50 cm2 separate two compartments.

At time (**t = 0s)**, **2 liters** of pure water are introduced into the first compartment and **2 liters** of an aqueous solution with a solute concentration of **1 mole/L** are introduced into the second compartment. If after **30 seconds** the concentration in the first compartment is **10^{-6} mole/cm^3**,

- Determine the thickness (**ε**) of the membrane assuming that the concentration gradient remains linear within the thickness (**ε**). **D = 5,344x10^{-5} cm^2**/s.