# Experiment HK-3: Kidney Osmosis Using the Oxygen Diffusion Chamber

## Equipment Required

PC or Mac Computer

IX-TA

ODC-320: Osmosis and Diffusion Chamber

Dialysis tubing 32mm flat width ( 20 mm diameter) 2inches in length

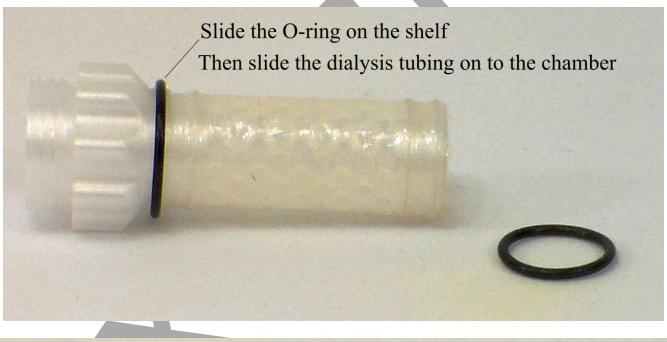
Iodine solution: (eg.  Ingredients: Water 95.10%, Potassium Iodide 3.05%, Iodine 1.85%)

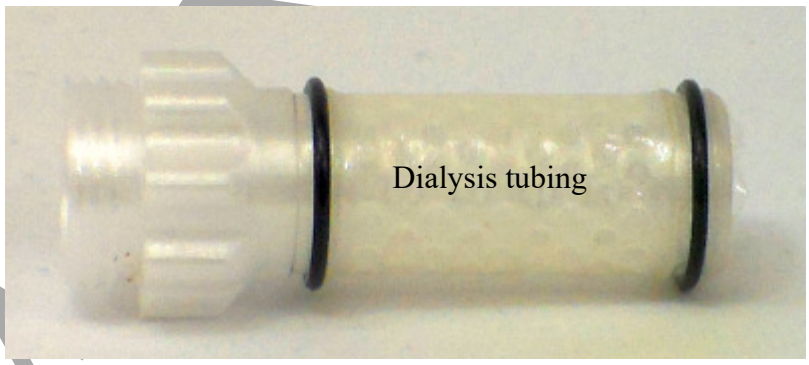
Distilled water

Powdered corn starch

## Oxygen Diffusion Chamber Setup

- Cut a piece of Dialyses tubing 2 inches long
- Place the Dialyses tube in water and open it.
- Slide one O-ring on the shelf
- Then slide the dialysis tubing on to the chamber
- Then slide the O-ring onto the tubing between the grooves
- Place the second O-ring at the bottom of the chamber in the grooves



**Preparing the Solutions**

1. Make a Starch solution by dissolving some corn starch in distilled water, The solution will appear milky
2. In a separate 250 ml beaker, add 5ml Iodine solution to about 225ml of distilled water.

**Setup the Equipment**

- Connect the IX-TA to the computer.
- Plug the ODC-320 cap to the channel 6 input of the TA.

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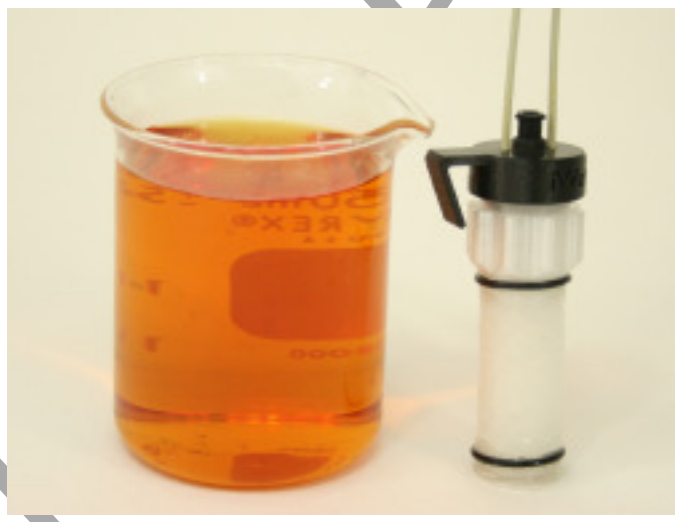
## Exercise 1: Movement of Small Particles Across a Membrane

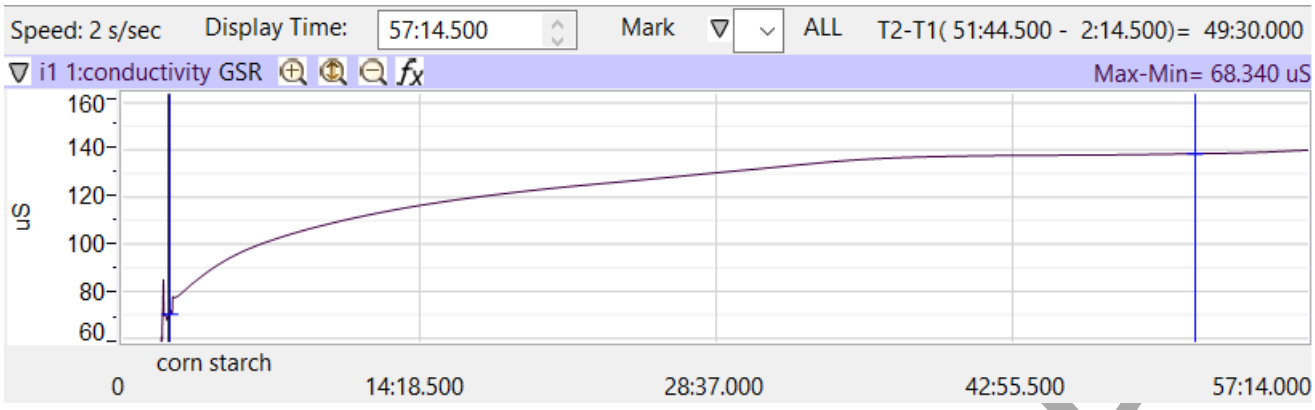
Aim: To determine if small or large molecules move across a membrane via a concentration gradient.

Approximate Time: 30-45 minutes

### *Procedure*

1. Pour the Starch solution into the ODC chamber leaving a little space at the top.
2. Place the cap on the ODC chamber.
3. Make sure that there are no leaks from the chamber. If there are leaks, then the experiment will not work.
    - If there are leak, reseal the chamber, and rinse the outside with distilled water.
4. Click Record to start recording data in LabScribe
5. Place the ODC chamber in the beaker with the iodine solution.
6. Observe the color of the solution and the color of the chamber.
7. After observing any color changes (this could take up to 45 minutes), click Stop to end the recording.
8. Click File → Save As and save your data file to the proper location on the desktop or USB drive.






***Questions***

1. Explain how the movement of water happens across a semipermeable membrane.
2. Explain how the movement of substances happens across a semipermeable membrane.
3. How does this explain the movement of substances in the kidney tubules?
4. Why do some particles not move across the membrane?
5. How does the kidney function to maintain proper ion/substance/water balance?