Diffusion Inquiry Activity

**Materials**

Unknown solutions A, B, C

Dialysis Tubing

1 Test cup or beaker

1 additional cup or beaker

Rinse bottle

Glucose indicator strips

Iodine

**Background**

Kidney dialysis machines, like the kidneys, work by filtering substances through membranes. Substances enter and leave all cells, including kidney cells, through the process of diffusion. To treat patients whose kidneys do not function properly, blood is passed through dialysis tubing inside the machine that is submerged in a solution that promotes diffusion. The dialysis tubing has small pores that allow some substances to pass in and out of the blood depending on the size and concentrations of the molecules. Each patient has a unique solution in which the dialysis tubing is submerged. In the following activity you will model the filtering portion of a kidney dialysis machine, determine the identity of unknown solutions A, B, and C and the direction of diffusion of each unknown substance.

**Instructions**

Use provided materials to determine the identity of unknown solutions and the direction of diffusion of each substance.

Enter results, conclusions and evidence in data table below.

Answer questions below data table.

Put completed document in your lab notebook and enter activity in the TOC

**Clean up**

All liquids used in your experiment can be poured down the drain. Solid materials go in the garbage. Cups will be re-used. Do not throw them away

**Hints**

Make a plan with your group first. Write it down. Discuss and record expected results at each step. Use the steps of the scientific method. Consider ways to conduct your experiment that minimize waste of materials and time and cross contamination of the various solutions and reagents you are using.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Solution | Identity of solution | Test 1 and result 1  (observations) | Test 2 and result 2  (observations) | Direction of diffusion  and evidence |
| A |  |  |  |  |
| B |  |  |  |  |
| C |  |  |  |  |

1. Explain why some or all of the unknown substances diffused
2. A patient’s blood is being treated by dialysis. Suppose you want solution “X” to be removed. What should the solution surrounding the dialysis tubing contain or not contain? Explain your answer (give your reasoning behind the answer using the factors that affect diffusion)
3. Draw a picture of what happened in your experiment. Include the movement of all 3 unknown substances and label everything