Diffusion in Water

Introduction

Everyone has had the experience of noticing cooking smells coming from the kitchen. Very small particles (molecules) of the food mix with the molecules of air and spread throughout the house. Air currents in the house help move the smells around, but, even if there were no air currents at all, the smells would still spread throughout the house. The molecules of any substance are constantly moving about randomly. This random molecular motion causes substances to mix thoroughly. Cooking smells eventually become evenly distributed throughout a house and beyond. Eventually, the food molecules become so dispersed that one is unable to detect them. This movement of molecules of a substance from an area of high concentration to areas of lower concentration is called diffusion. Diffusion also occurs in water and even in solids. In this investigation you will observe a substance diffusing through water.

Objectives:

- Form an inference from a set of related observations.
- Demonstrate that properties of water can be changed by adding or removing energy.
- Relate changes in temperature to changes in the motion of molecules, and Module Objec[illegible]

Equipment and Materials:

3 - 250 ml beakers
Crayola Tub Tint Tablet
forceps

Procedure:

1. Fill two 250 ml beakers about half full of cold tap water. Label them A and B. Fill a third beaker half full of hot water. Label it C.

2. Wait several minutes for water currents to stop moving in the beakers.

3. Using forceps, drop one Crayola tub tint tablet into each beaker. Do not agitate the water.

4. Observe the beakers for a few minutes and answer questions 1 to 3.

5. Using forceps, gently stir the water in Beaker B. Observe the results and answer questions 4 and 5.

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Questions:

1. Describe what happened to the ~~Crayola~~ Tub Tint Tablet when it was added to water.

2. Explain how diffusion occurs.

3. Compare the rates of diffusion in beakers A and C and form an inference to explain any observed differences.

4. The introduction gave an example of diffusion in air. How is the example comparable to what happened in beaker B?

5. The stirring of beaker B and the heat in beaker C are both forms of energy. Write a statement that relates energy, molecular motion and diffusion.