Distillation Laboratory

**Purpose**
To use a distillation process to separate components of a mixture.

**Safety**
Always wear safety goggles when working with chemicals in a laboratory setting. Always use appropriate safety equipment when working with hot glassware.

**Materials**
- 400-mL beaker
- 50-mL beaker
- Large rubber stopper
- Large watch glass
- Water
- Cinnamon
- Food coloring
- Hot plate
- Ice
- Crucible tongs
- Safety goggles

**Procedure**
1. Obtain a large watch glass and a rubber stopper.

2. Place the large stopper in the bottom of a 400-mL beaker, with the wide end down. Add 50 mL of distilled water to the beaker. The water level should be slightly below the top of the stopper. (see the diagram)

3. Remove the stopper from the water. Add two drops of food coloring to the water.

4. Stir approximately 0.10 g of cinnamon powder into the beaker.

5. Place the beaker on the hot plate.

6. Place the stopper back in position in the middle of the bottom of the 400-mL beaker. Carefully place a clean, dry 50-mL beaker on top of the stopper.
7. Place a large, clean, dry watch glass over the top of the 400-mL beaker.

8. Place a few small pieces of ice in the watch glass on top of the beaker.

9. Heat to boiling with the hot plate, then reduce the heat so that the contents of the
beaker begin simmering. Continue simmering until the 50-mL beaker inside is about ¼
full of liquid. If you overheat, the solution will boil over into the small beaker. You
don’t want this to happen.

10. Turn off the hot plate. Carefully remove the watch glass with your crucible tongs.
Use the same tongs to carefully remove the small 50-mL beaker. Closely observe the
liquid in the 50-ml beaker.

11. Clean up and put away all equipment, and clean up your lab station.

Results/Observations
Describe all changes that occurred to the mixture during this experiment.

Analysis

1. Using a textbook or other resource, define the term “distillation”.

2. Define the term “mixture”.

3. Describe whether the original mixture prepared in this lab was heterogeneous or
homogenous. Explain your answer.

4. Describe how the distillation apparatus used in the lab worked. (Explain what was
occurring during the process.)
5. Describe the appearance of the liquid collected in the small beaker.

6. What do you think was in the liquid in the small beaker? Explain your answer.

7. Describe how you might go about separating a mixture of salt, water, iron filings, and saw dust into four separate containers.

**Conclusion**

Explain what occurred during the lab. What did the distillation process do to the mixture, and how did this work?

Did the experiment work as planned? Why or why not? What changes could be made to improve the procedure or results?