EXERCISE 5
SEPARATION OF CERTAIN MIXTURES

Objectives:

1. Familiarize the student with extraction.

2. Familiarize the student with distillation.

Separation and identifying compounds is an important chemical technique.

In this experiment we will make use of three methods of separating mixture, filtration, extraction, and distillation.

Equipment:

1. iron stand

2. eye dropper

3. test tube and test tube holder

4. stirring rod

5. condenser

6. beaker

7. evaporating dish

8. burner

Filtration:

Check out a 2 g sample from the stock room and transfer it to a 250 ml beaker. Add about 100 ml of water to the beaker and stir the solution. Support a funnel in the iron ring, place the filter paper in the funnel and wet it. (Your instructor will demonstrate the set up for you.) Place a clean 250 ml beaker under the funnel. Now pour the solution into the funnel along a stirring rod. Identify the filtrate (1) and the precipitate (2). Place about 25 ml of the filtrate in an evaporating dish. Place a wire gauze, and carefully evaporate the solution to dryness. Identify and taste the residue in the evaporating dish (3).

Extraction:

Place 5 ml of solution of iodine in water in a large test tube. Add 5 ml of petroleum ether to the test tube, stopper test tube with a cork and shake test tube for 15 seconds. Place test tube in a test tube rack and allow the solution to separate into two layers. Judging from the color of the two layers in which is iodine more soluble (4)? Did the petroleum ether extract all the iodine from the water (5)? Use an eyedropper and remove upper layer. Then add to the test tube another 5 ml of petroleum ether, stopper and shake the test tube for 15 seconds. Compare the color of the two layers. Which extraction removed the larger portion of iodine (6)? Predict the effectiveness of a third extraction (7)?

Distillation:

Dissolve about 1 g of sodium chloride in about 100 ml of water. Pour the solution into the distilling flask. Add a few boiling chips and set up the apparatus shown in Figure (5-1). Heat the solution until a gentle boil is reached. Collect about 20 ml of distillate in a clean beaker. Taste the distillate. Define simple distillation and fractional distillation (9).

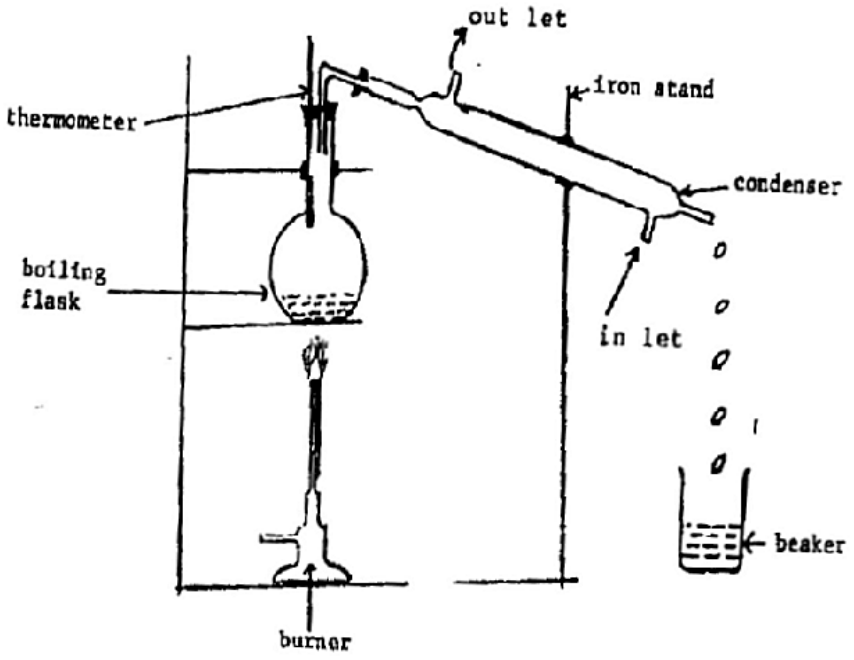

Figure 5-1

EXERCISE 5

ANSWER SHEET

Name _____ Section _____

Date _____

1. Is iodine more soluble in water or in petroleum ether? _____
2. Did the petroleum ether extract all of the iodine? Yes_____ No _____
3. Which extraction is more effective, First_____ or Second _____
4. Predict effectiveness of Third Extraction

5. Effectiveness of Distillation

6. Simple vs. Fractional Distillation