

## EXERCISE 12

### Preparation and Reactions of Oxygen

#### Introduction

Oxygen is the most abundant element in the earth's crust (4-20 miles thick). In free state, it constitutes about 21% of the atmosphere. Oxygen is a colorless, odorless, and tasteless gas. At room temperature its density is slightly larger than the density of air.

#### Objectives

1. to prepare oxygen
2. to study few reactions of oxygen

#### Equipment

1. Wide mouth jars
2. test-tubes
3. iron stand and clamps
4. pneumatic trough
5. crucible tong
6. deflagrating spoon

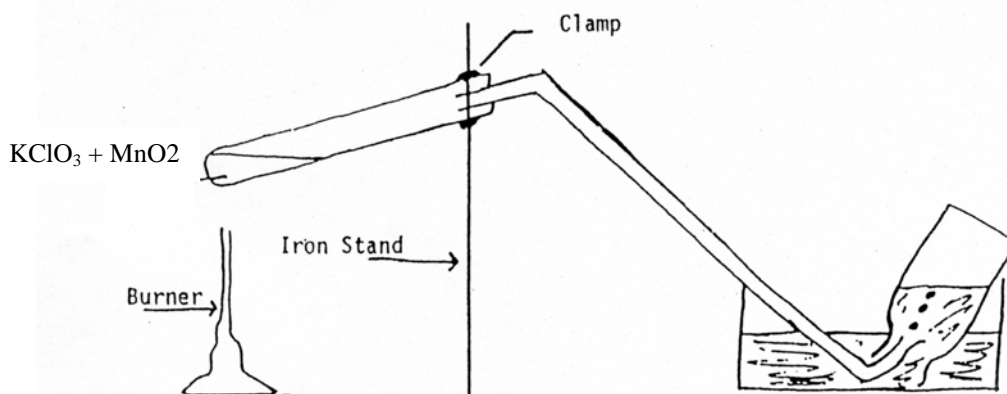


Figure 12-1

### Procedure

Weigh out approximately 10 g of potassium chlorate and 1.5 g of manganese dioxide in a small, clean, dry beaker and mix thoroughly. Transfer the mixture to a test tube and assemble as shown in Figure 13-1. Seek instructor's approval.

Heat test tube and contents. Collect the formed oxygen in three gas jars. When a bottle is filled with oxygen, remove from the pneumatic trough and immediately cover the bottle with a glass plate.

Now conduct the following reactions:

1. Ignite a wood splint, blow out the flame, and insert glowing splint into the first oxygen jar. Repeat but use a jar of air. Report your observation on answer sheet. (4)
2. Conduct this reaction in the hood. Place a small amount of sulfur on a deflagrating spoon and ignite the sulfur, using the burner. Lower the sulfur into the second oxygen jar. Repeat but use a jar of air. Report observations on answer sheet. (5)
3. Pour about 30 ml of water into the third bottle and replace the glass plate. Take a small steel wool wad in the crucible tong. Heat the wad over burner. When the wad glows, lower it into the third bottle of oxygen. Repeat using a bottle of air. Record observation. (6)
4. Add 10 ml of water to the second bottle and shake contents. Introduce a blue litmus paper. Record observations. (7)

## EXERCISE 12

### ANSWER SHEET

NAME \_\_\_\_\_ SECTION \_\_\_\_\_ DATE \_\_\_\_\_

1. Write and balance a chemical reaction for the formation of oxygen from potassium chlorate.
2. What is the function of the manganese dioxide?
3. How can the manganese dioxide be reclaimed?
4. Burning of wood splint:
5. Burning of sulfur:
6. Burning of iron:
7. Litmus paper:
8. Calculate the volume of oxygen formed at 20°C and 740 mm of Hg from decomposing 10 g of potassium chlorate.