

EXERCISE 6

Percent of NaCl in a mixture of NaCl and KClO₃

OBJECTIVES:

1. To become familiar with stoichiometric calculations.
2. To become familiar with the operation of an analytical balance.
3. To develop the ability to obtain accurate and reproducible measurements.

Potassium chlorate (KClO₃) decomposes upon heating to potassium chloride (KCl) and oxygen (O₂) according to the following equation.

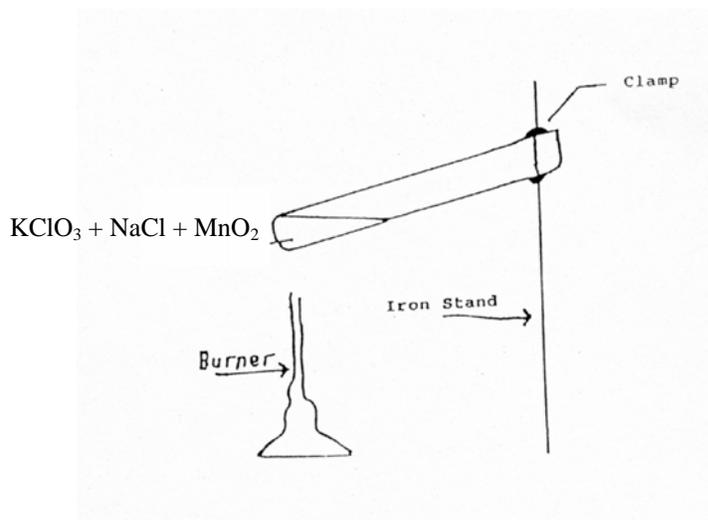


This is an example of a decomposition reaction. Oxygen is lost to the atmosphere, leaving potassium chloride in the test tube. Sodium chloride does not decompose upon heating. The loss in weight represents the weight of oxygen originally present in potassium chlorate. It is possible to calculate the weight of potassium chlorate in the mixture using the loss of weight due to oxygen.

Equipment:

1. Test tube
2. Balance
3. Clamp
4. Iron Stand
5. Burner

Figure 6-1



Procedure

1. Add approximately .1 g of manganese dioxide (MnO_2) to a dry, clean test tube. Weigh the MnO_2 and the test tube to nearest .001 g using the analytical balance.
2. Obtain an unknown mixture of sodium chloride (NaCl) and potassium chlorate (KClO_3) from your instructor. Add 3 g of your unknown to the test tube, mix thoroughly with MnO_2 , and reweigh to nearest .001 g.
3. Calculate the weight of your sample.
4. Heat until the reaction is over. Cool to room temperature and weigh.
5. Reheat the test tube, cool and reweigh until a constant weight is obtained.
6. Calculate the weight of oxygen in the sample.
7. Calculate weight of KClO_3 .
8. Calculate the weight of NaCl .
9. Calculate the percent of NaCl .
10. Obtain the weight of NaCl for your sample from the instructor and calculate the percent error and show all your calculations.

ANSWER SHEET

EXERCISE 6

NAME _____ SECTION _____ DATE _____

SAMPLE NO. _____

1. Weight of test tube + MnO_2 _____
2. Weight of test tube, MnO_2 , and sample..... _____
3. Weight of sample _____
4. Weight of test tube, MnO , and sample after first heating _____
5. Weight of test tube, MnO_2 , and sample after constant weight is reached _____
6. Weight of oxygen _____
7. Weight of KClO_3 _____
8. Weight of NaCl _____
9. Percent of NaCl _____
10. Accepted weight of NaCl _____
11. Percent error _____