

Name: \_\_\_\_\_

Chem 10, Section: \_\_\_\_\_

Lab Partner: \_\_\_\_\_

Experiment Date: \_\_\_\_\_

## The Composition of Potassium Chlorate

### Part A: Mass Percent of Oxygen in Potassium Chlorate

#### Experimental Data

	Sample 1	Sample 2
(a) Mass of crucible + lid		
(b) Mass of crucible, lid + $\text{KClO}_3$		
(c) Mass of crucible, lid + residue after 1 <sup>st</sup> heating		
(d) Mass of crucible, lid + residue after 2 <sup>nd</sup> heating		
(e) Mass of crucible, lid + residue after 3 <sup>rd</sup> heating		

#### Data Analysis

- Use your data to determine the experimental mass percent of oxygen in  $\text{KClO}_3$ . Show your work clearly for each step in the table below.

	Sample 1	Sample 2
Mass of original $\text{KClO}_3$ sample		
Mass of $\text{KCl}$ residue		
Mass of Oxygen released		
Mass Percent of Oxygen in $\text{KClO}_3$		
Average Mass Percent Oxygen		

- Using molar masses along with the known formula of potassium chlorate, calculate the theoretical mass percent of oxygen in  $\text{KClO}_3$ . Show your work clearly.

- Calculate the percent error between your average experimental value and theoretical value for the mass percent of oxygen in  $\text{KClO}_3$ . Show your work clearly.

### Part B: Qualitative Examination of Residue

#### Observations and Analysis

Tube	Observations (after the addition of <u>both</u> nitric acid and silver nitrate)
#1: Potassium Chlorate	
#2: Potassium Chloride	
#3: Residue from Crucible	

- Explain how your observations in the table above verify that the residue in your crucible after heating is potassium chloride.

- Are there any other observations that you have made during this experiment (not those in the table above) that would suggest that the potassium chlorate was converted to a new substance upon heating?

## Questions

- 1) Was your average experimental mass percent of oxygen in potassium chlorate higher or lower than the theoretical value (circle one)? Higher Lower

Which of the following sources of error **could** be used to explain this discrepancy (circle one)?

- A. The potassium chlorate sample was not heated strongly or long enough.  
B. Some of the potassium chloride product splattered out of the crucible during the heating process.

Explain your choice. Your response should include an analysis of the calculations you performed with your raw data to obtain your experimental % of oxygen.

- 2) Suppose the stockroom made a mistake and gave you a mixture of potassium chlorate and potassium chlorite. Upon analysis of this mixture, would you obtain a larger or smaller mass percent of oxygen than you would for an equal mass of pure sample of potassium chlorate (circle one)? Larger Smaller

Explain your choice. Your response should include an analysis of the formulas of the compounds involved.

- 3) Show your calculations clearly. Suppose you are provided with a 36.55 g sample of potassium chlorate.

a. What mass of oxygen should theoretically be released upon heating?

b. What mass of potassium chloride residue should theoretically be left over after heating?