Section: _____

Data and Calculations for Experiment 6

- A. Quantitative Determination of Percent Composition
 - 1. When solid KClO₃ is heated above 400 °C, it decomposes to solid potassium chloride and elemental oxygen gas. Write the balanced equation for the decomposition of KClO₃ solid.
 - 2. What is the remaining residue in the crucible after heating?
 - 3. What substance is lost during the heating?

| | | Sample 1 | Sample 2 | | | | |
|-----|---|----------|----------|--|--|--|--|
| 4. | Mass of crucible and cover | | | | | | |
| 5. | Mass of crucible, cover and sample | | | | | | |
| 6. | Mass of crucible, cover and sample after 1 st heating | | | | | | |
| 7. | Mass of crucible, cover and sample after 2 nd heating | | | | | | |
| 8. | Mass of crucible, cover and sample after 3 rd heating | | | | | | |
| 9. | Mass of original sample | | | | | | |
| 10. | 10. Mass of the residue | | | | | | |
| 11. | 11. Mass lost upon heating | | | | | | |
| 12. | 12. Experimental percentage of KCl in the KClO ₃ sample. | | | | | | |

Sample 1:

Sample 2:

13. Experimental percentage of oxygen in the KClO₃ sample.Sample 1:

Sample 2:

14. Using the atomic masses from the periodic table, solve for the molar mass of KClO₃.

| 15. | Theoretical | percentage | of KCl in | the | KClO ₃ sample |
|-----|-------------|------------|-----------|-----|--------------------------|
|-----|-------------|------------|-----------|-----|--------------------------|

16. Theoretical percentage of oxygen in the KClO₃ sample

17. Percent error in oxygen determination Sample 1:

Sample 2:

B. Qualitative Examination of the Residue

- 1. Record what you observed when AgNO₃ solution was added to the following:
 - i. KCl
 - ii. KClO₃

iii. Residue

- 2. What does the evidence lead you to believe about the residue?
- 3. Does the evidence from the AgNO₃ test prove conclusively (without a doubt) that the residue is KCl? Explain.

<u>Pre-Lab Assignment</u> (to be completed before coming to lab)

- 1. a) Write the balanced equation for the decomposition of $Mg(ClO_3)_2$ solid.
 - b) A student heated 1.228 grams of Mg(ClO₃)₂ until a stable weight was determined. The remaining residue weighed 0.584 grams. Solve for the experimental percentage of oxygen.
 - c) Calculate the theoretical percentage of oxygen in Mg(ClO₃)₂.
 - d) Calculate the percent error in oxygen determination.
- 2. Given the mass percent of each element:

18.8% Na 29.0% Cl 52.2% O

Solve for the empirical formula and name it.

- 3. Predict the products and balance the equations for the following decomposition reactions:
 - a) NaClO₃(s) \rightarrow
 - b) $Ca(ClO)_2(s) \rightarrow$
 - c) $Al(ClO_3)_3(s) \rightarrow$
 - d) $Mg(ClO_2)_2(s) \rightarrow$