Mole Ratio Worksheet

The unbalanced equations for the three reactions are as follows:
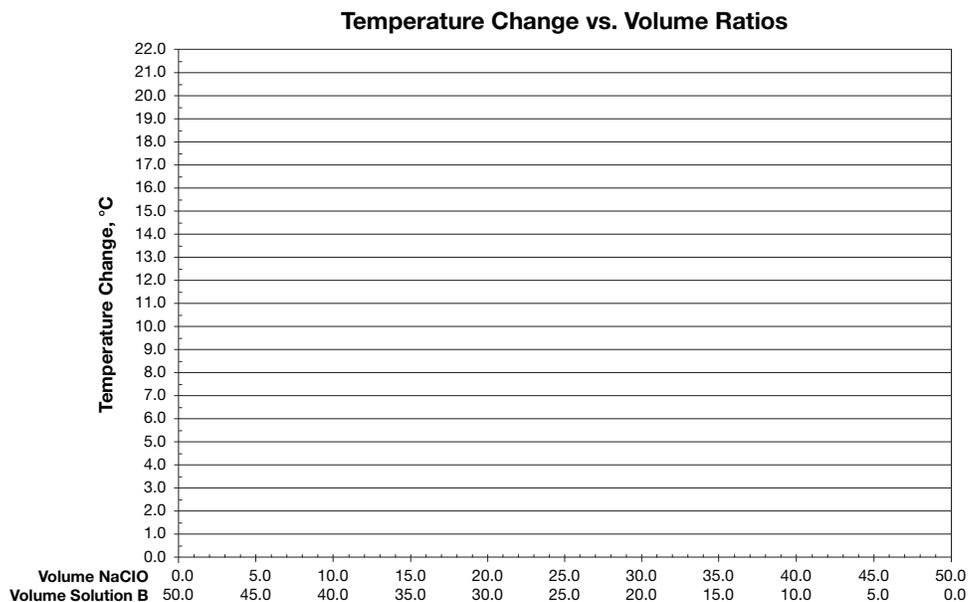
$NaClO(aq) + KI(aq) \rightarrow NaCl(aq) + KIO_3(aq)$

$NaClO(aq) + Na_2S_2O_3(aq) + NaOH(aq) \rightarrow Na_2SO_4(aq) + NaCl(aq) + H_2O(l)$

$NaClO(aq) + Na_2SO_3(aq) \rightarrow Na_2SO_4(aq) + NaCl(aq)$
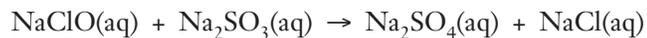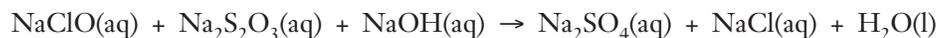
Data Table

Initial Temperature _____

mL NaClO	mL *Soln B*	T_{final}(ºC)	ΔT(ºC)	mL NaClO	mL *Soln B*	T_{final}(ºC)	ΔT(ºC)

Plot the data on a graph.

Temperature Change vs. Volume Ratios

Calculations

1. Balance the following redox equations involving sodium hypochlorite as the oxidizing agent.

$NaClO(aq) + KI(aq) \rightarrow NaCl(aq) + KIO_3(aq)$

$NaClO(aq) + Na_2S_2O_3(aq) + NaOH (aq) \rightarrow Na_2SO_4(aq) + NaCl(aq) + H_2O(l)$

$NaClO(aq) + Na_2SO_3(aq) \rightarrow Na_2SO_4(aq) + NaCl(aq)$
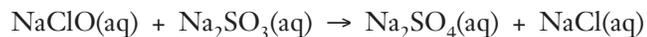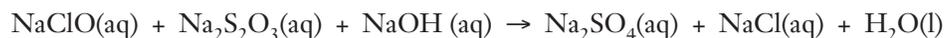
2. Based on the data obtained in this demonstration, what is the identity of the "B solution" in the reaction?

Questions

1. Explain how the method of continuous variation is used to determine the mole ratio of reactants in a chemical reaction.

2. What is meant by the term limiting reagent?

3. Which reactant is the limiting reagent along the upward sloping line of the graph? Which is the limiting reagent along the downward sloping line?

4. What other physical properties, other than temperature change, could be used in the method of continuous variation?

5. Why is it more accurate to use the point of intersection of the two lines to find the mole ratio rather than the ratio associated with the greatest temperature change?