

Experiment A Report: Enthalpy and Calorimetry

Name: _____

Date of Experiment: _____

Date of Report: _____

Experimental Results

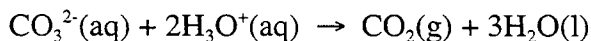
Letter/Code of Unknown: _____

Part 1		Part 3	
$\Delta T_{(\text{calorimeter} + \text{water})}$		$\Delta T_{(\text{calorimeter} + \text{water})}$	
$c_{\text{calorimeter}}$		ΔH per mole H_2O	
Code letter of calorimeter			
Part 2		Part 4	
$\Delta T_{(\text{calorimeter} + \text{water})}$		s_{metal} (trial 1)	
ΔH per mole H_2O		MW	
		s_{metal} (trial 2)	
		MW	
		identity of metal	

Attach all five plots of temperature vs. time with ΔT calculated and labeled on each plot. Attach your calculations (these may be handwritten, but should be presented thoroughly and clearly, with appropriate units.)

Questions

1. Consider the reaction between NaOH and HCl, as conducted in this experiment.
 - a. Is this reaction exothermic or endothermic?
 - b. Draw a diagram showing the enthalpy change as a function of the reaction coordinate for this process. Label ΔH for the reaction in your diagram.
2. Consider the reaction of carbonate ion with excess acid given by:



Calculate the enthalpy change when 1.40 g of Na_2CO_3 reacts with excess acid. You may assume that this reaction occurs at 25°C and 1 atmosphere pressure. (Note that H^+ is not the same as H_3O^+ .)

3. If the reaction in question 2 were studied in a constant volume (bomb) calorimeter, would the final temperature be higher or lower than the final temperature observed in a constant pressure calorimeter? Explain.