FLINN SCIENTIFIC

Name_____

Heats of Reaction and Hess's Law

Data Table

	Reaction A (Mg + HCl)		Reaction B (MgO + HCl)	
	Trial 1	**Trial 2**	**Trial 1**	**Trial 2**
Mass of Calorimeter (g)				
Mass of Calorimeter + HCl Solution (g)				
Mass of Mg (Reaction A) or MgO (Reaction B) (g)				
Initial Temperature (°C)				
Final Temperature (°C)				

Post-Lab Calculations and Analysis *(Show all work on a separate sheet of paper.)*

Construct a Results Table to summarize the results of all calculations. For each reaction and trial, calculate the:

1. Mass of hydrochloric acid solution.
2. Total mass of the reactants (solids and liquids).
3. Change in temperature, $\Delta T = T_{final} - T_{initial}$.
4. Heat (q) absorbed by the solution in the calorimeter. *Note:* $q = m \times s \times \Delta T$, where s is the specific heat of the solution in J/g·°C. Use the total mass of reactants for the mass (m) and assume the specific heat is the same as that of water, namely, 4.18 J/g·°C.
5. Number of moles of magnesium and magnesium oxide in Reactions A and B, respectively.
6. Enthalpy change for each reaction in units of kilojoules per mole (kJ/mole).
7. Average enthalpy change (heat of reaction, ΔH_{rxn}) for Reactions A and B. *Note:* The enthalpy change is positive for an endothermic reaction, negative for an exothermic reaction.
8. Use Hess's Law to calculate the heat of reaction for Equation 1. *Hint:* See your answer to PreLab Question #2.
9. The heat of reaction for Equation 1 is equal to the heat of formation of solid magnesium oxide.
   a. Look up the heat of formation of magnesium oxide in your textbook or a chemical reference source.
   b. Calculate the percent error in your experimental determination of the heat of reaction for Equation 1.