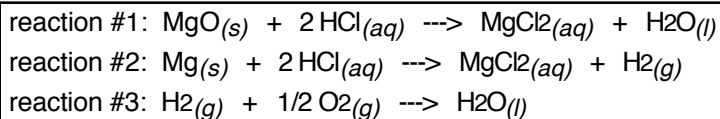


Heat of Formation using Hess's Law Lab

Name: _____

In this lab, you will determine the H_f for magnesium: $Mg(s) + 1/2 O_2(g) \rightarrow MgO(s)$ (reaction #4)

Since this would be difficult to measure directly, we will instead use the following 3 reactions & combine them using Hess's Law:



Pre-Lab Exercise: below, combine reaction 1, 2, & 3 to obtain the desired reaction (#4):

#1 _____

#2 _____

#3 _____

+
#4 _____

Procedure:

reaction #1:

1. Weigh ca. 100 g of HCl solution into styrofoam calorimeter. Record the mass of HCl solution used.
2. Weigh ca. 1 g of MgO on weighing paper. Record the mass of MgO used.
3. Take the initial temperature of the solution.
4. Add the MgO to the calorimeter & mix. Record the maximum temp. reached. Discard the solution down the sink.

reaction #2: Repeat the steps above, but use the piece of Mg ribbon provided by Mr. A instead of the MgO. Be sure to record the mass of the ribbon.

reaction #3: simply look-up the H_f values on your reference sheet in your packet.

Data / Calculations:

reaction #1

mass of solution _____

specific heat of solution (J/g°C): 4.184

initial T of solution: _____

final T of solution: _____

ΔT of solution: _____

q gained by solution (J): _____

mass of MgO used: _____

moles of MgO used: _____

H_f for reaction #1 (kJ/mol): _____

reaction #2

mass of solution _____

specific heat of solution (J/g°C): 4.184

initial T of solution: _____

final T of solution: _____

ΔT of solution: _____

q gained by solution (J): _____

mass of Mg used: _____

moles of Mg used: _____

H_f for reaction #2 (kJ/mol): _____

Calculate H_f for reaction #4:

Refer to your reference table for the actual value for $H_f(MgO)$: _____

Calculate your % error: