Name_____Section_____

Partner_____

CHM115 Lab 9 Report Form

Graph all data for each of the 4 reactions, and indicate on the graph when the reactant was added. As described in the introduction, calculate ΔT. As always, show sample calculations. See the graphing tips for help drawing 2 lines on one graph, and look carefully at the example in the lab introduction.

Use the following data to calculate ΔH in kJ/mol. Think carefully about your masses (hint: the first solution has a mass of ~52.5 g).

The density of water is 1.00 g/mL.
The specific heat of your $NH_4Cl(aq)$ is 4.00 J/g°C.
The specific heat of your NaOH(aq) is 3.93 J/g°C.
The density of the NaCl(aq) produced is 1.02 g/mL, and its specific heat is 4.02 J/g ^{o}C.

Heats of solution:

Rxn		Mass solid (g)	Mass soln (g)	ΔT (^{o}C)	ΔH(kJ/mol)
1	$NH_4Cl(s)$				
2	NaOH(s)				

Heats of Neutralization:

Rxn		Mass solid (g)	Mass soln (g)	ΔT (^{o}C)	ΔH(kJ/mol)
3	NaOH(aq) + HCl(aq)	N.A.			
4	NaOH(s) + HCl(aq)				

Show how the data for reactions 2, 3 and 4 represent an example of Hess's Law. Mathematically manipulate the balanced equations for 2 and 3 so that you generate the equation for 4. Combine the associated enthalpies in the same fashion to generate a theoretical value for ΔH for reaction 4.

Rxn_____ ΔH _____
Rxn_____ ΔH _____
Net Rxn_____ Calc. ΔH _____

Find the percent difference between the calculated ΔH from Hess's law and the directly measured ΔH from the table (show work). Note

$$\% \text{ Diff} = \left| \frac{x_1 - x_2}{(x_1 + x_2)/2} \right| \times 100$$