Name____Section___________
Partner____

CHM 111 Calorimetry Lab Report Form

Graph all data for each of the four 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 two 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 ^oC.

Heats of solution:

Rxn		Mass solid (g)	Mass soln (g)	ΔT (^oC)	ΔH (kJ/mol)
1	$NH_4Cl(s)$				
2	NaOH(s)				

Heats of Neutralization:

Rxn		Mass solid (g)	Mass soln (g)	ΔT (^oC)	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 reactions 2 and 3 so that you generate the equation for reaction 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):

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