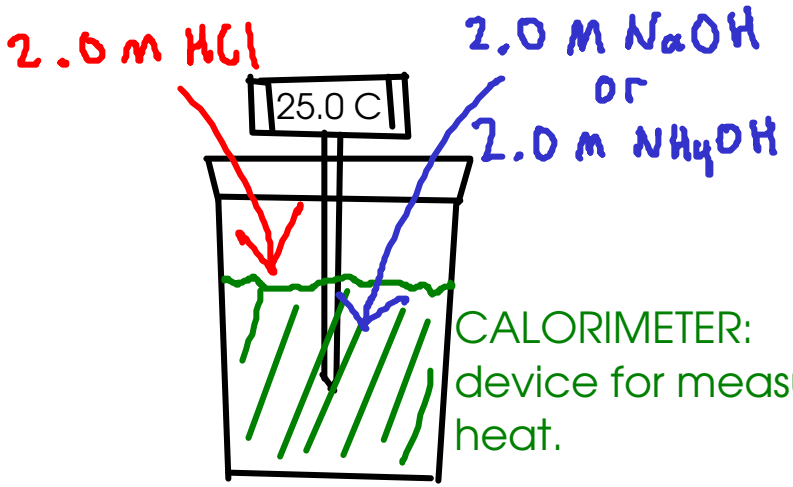
Today:
- Expt 6 (modified)

Turn in (next lab):
- Handout with graphs

Turn in (today)
- Report 5B



CALORIMETER: device for measuring heat.

We will measure the ENTHALPY OF REACTION of two ACID/BASE NEUTRALIZATION reactions:

$HCl(aq) + NaOH(aq) \rightarrow NaCl(aq) + H_2O(l)$

$HCl(aq) + NH_4OH(aq) \rightarrow NH_4Cl(aq) + H_2O(l)$

To do this, we'll mix the reactants in a CALORIMETER and measure the temperature change from the initial mixing until the end of the reaction.

The FIRST LAW OF THERMODYNAMICS will allow us to calculate the heat:

$$Q_{system} + Q_{water} + Q_{cup} = 0$$

$$Q_{water} = \text{mass}_{water} \times 4.184\ \text{J/g°C} \times (t_f - t_i)$$

(4.184 J/g°C: specific heat)

$$Q_{cup} = 10\ \text{J/°C} \times (t_f - t_i)$$

(10 J/°C: heat capacity)

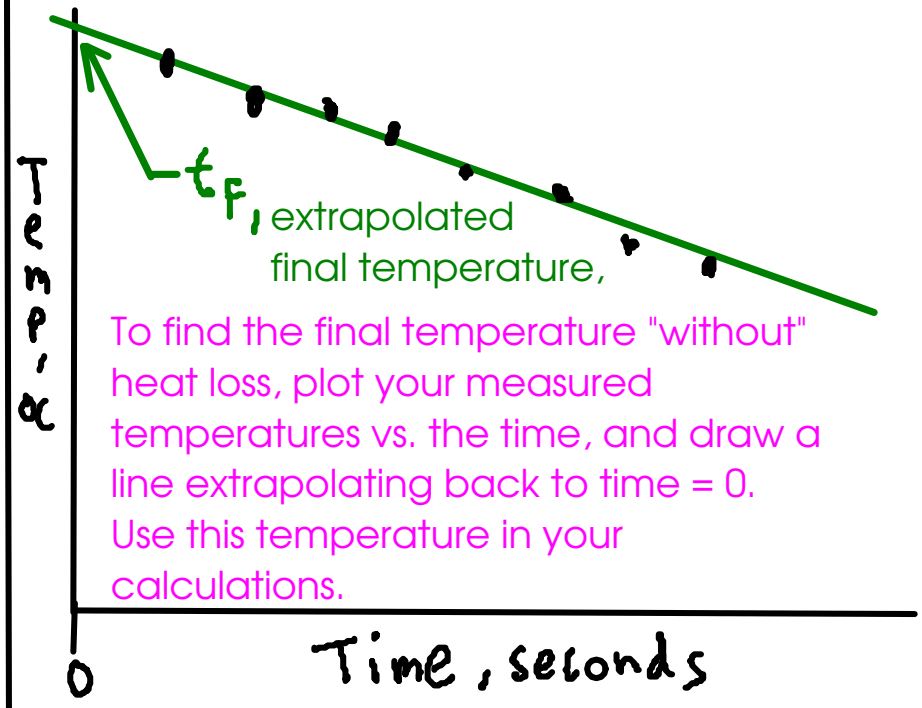
and...

t_f = final temp (C)

t_i = initial temp (C)

$$\Delta H = \frac{Q_{system}}{\text{mol limiting}}$$

But we need to account for heat loss to the outside by correcting the final temperature!



To find the final temperature "without" heat loss, plot your measured temperatures vs. the time, and draw a line extrapolating back to time = 0. Use this temperature in your calculations.