

REGULAR LAB 12b: Enthalpy Changes

Aim To calculate values for the enthalpy changes occurring in two reactions

Apparatus Insulated cup, thermometer, stirring rod, electronic balance, measuring cylinder

Chemicals 1.00 M citric acid solution, 0.200 M CuSO₄ solution, zinc granules, sodium hydrogen carbonate powder

Method

EXPT A

1. Using a graduated cylinder, place 100. mL of 0.200 M CuSO₄ solution into an insulated cup.
2. Record the initial temperature of the CuSO₄ solution.
3. Add 2.00 g (an excess) of zinc granules and stir the contents of the cup.
4. Record the **highest** temperature reached.

EXPT B

1. Using a graduated cylinder, place 100. mL of 1.00 M citric acid (C₆H₈O₇) solution into an insulated cup.
2. Record the initial temperature of the citric acid.
3. Add, **a little at a time each time allowing the effervescence to subside**, 26.0 g (an excess) of sodium hydrogen carbonate powder and stir the contents of the cup.
4. Record the **lowest** temperature reached.

Results

	EXPT A	EXPT B
Initial temperature (Before mixing)		
Final temperature (After mixing)		
Change in temperature		



Conclusion/Calculation

1. Using the equation

$$q = m c \Delta T$$

Where;

m = mass of solution (assume density of solutions to be 1.00 g mL^{-1})

c = specific heat capacity of the solutions (assume to be $4.18 \text{ kJ kg}^{-1} \text{ K}^{-1}$)

ΔT = temp change

Calculate the heat change (q) in each of your experiments.

Experiment A

Experiment B

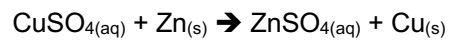


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2. Using your answers from question #1, calculate the ΔH in kJ mol^{-1} for the following reactions.

Experiment A



Experiment B

