SCH 4UI Lab: Calculating Molar Enthalpy using a Water Calorimeter

LAB WRITEUP

1. Title page – title of lab, date done, course code, teacher, name, date due

2. Introduction
    a. Define the calorimetry, how does a water calorimeter work
    b. Define molar enthalpy of solution and molar enthalpy of combustion
    c. Describe the relationship between the system and the surroundings with respect to energy transfer
    d. Describe the assumptions made in this lab activity in terms of dilute solutions and energy transfer with the combustion reaction

3. Materials
    a. Draw a labelled diagram of both set ups

4. Procedure
    a. Write <u>two</u> step by step <u>procedures</u>
    b. Assume you are describing the procedure to a grade 11 student

5. Observations
    a. Make two Tables of Quantitative observations

6. Calculations
    a. Write a balanced chemical equation for the each “reaction” that occurred
    b. Calculate the experimental molar enthalpies
    c. Identify the theoretical molar enthalpies with the appropriate reference.
    d. Calculate your percentage error

        (% error = (($\left|$ expected - observed $\right|$) / expected) x 100%).

7. Evaluation
    a. If some energy was transferred to the air or styrofoam cups would your calculated enthalpy values be too high or too low? Explain with calculation.
    b. If some of the salt spilled on to the balance while you were obtaining your sample and you did not clean it up then how would that affect your calculated enthalpy value?
    c. NaOH and NH_4Cl produce an exothermic reaction. Why is that something to worry about in this lab when calculating enthalpy values?
    d. Two other possible source(s) of experimental error are leftover water in the cups and the specific heat capacity of metal; describe how each error would impact the calculated enthalpy value.