Chemistry 122 **Specific Heat and Calorimetry Worksheet**

1. A calorimeter has a heat capacity of 4.18 kJ/g °C. Complete combustion of 1.00 g of hydrogen in this calorimeter causes the water temperature in the calorimeter to increase 3.54 °C. If the liquid in the calorimeter has a mass of 9.569 g, calculate the molar enthalpy of combustion for hydrogen from this evidence. **(H_c = -286 kJ/mol)**

2. A reference gives the molar enthalpy of combustion for methane as -803 kJ/mol. What minimum mass of methane must be burned to warm 4.00 L of water from 22.4 °C to 87.6 °C, assuming no heat losses? **(m = 21.8g CH_4)**

3. Combustion of 3.50 g of ethanol, $C_2H_5OH_{(l)}$, in a calorimeter with a heat capacity of 1.38 kJ/g °C causes a temperature increase of an unspecified liquid to rise from 19.88 °C to 26.18 °C. If the volume of the liquid is 11.0 mL, find the molar enthalpy of combustion for ethanol from this evidence. **($Hc_{(METHANE)}$ = -1260 kJ/mol)**

4. Find the temperature increase expected for 1.00 L of water when it absorbs all of the energy from the combustion of 1.00 g of acetylene, $C_2H_{2(g)}$. The molar enthalpy of combustion for acetylene is -1.29 MJ/mol. **(ΔT = 11.9 °C)**

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