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9. Place the bomb in the calorimeter, attach the ignition wires to the top of bomb, cover the calorimeter by aligning the pilot hole and screw, and turn on the stirrer.

10. Wait 5 minutes and observe the temperature at 30 second intervals until a constant equilibrium temperature is achieved (4 constant values). Record this temperature.

11. Plug in the wires onto the ignition unit and press the button to ignite your sample.

12. Continue to observe the temperature until a constant equilibrium temperature is achieved. Record this temperature.

13. Carefully remove the cover and place it in the holder.

14. Remove the bomb, equalize the pressure, disassemble and completely dry all parts of the bomb.

15. If successive trials are to be run, add a new 2000 mL supply of D.I. water to the bucket and repeat steps 3–14.

Data and Calculations

Volume of sample _______________ Density of sample _______________

Initial temperature _______________ Final temperature _______________

1. Write a balanced equation for the combustion reaction of one mole of 1-butanol.

2. Calculate the mass (in g) of the 1-butanol sample.

3. Calculate the heat of reaction per mole of 1-butanol. ***Our calorimeter constant (Heat Capacity) = 10.3 kJ / °C***

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4. Does question #3 solve for ΔE (internal energy) or ΔH (enthalpy)? Circle your choice and briefly explain.

5. Calculate the **ideal** work per mole of alcohol for the combustion reaction at 1 atm and 25 °C.

6. Give the following values in kJ/mol for $CH_3(CH_2)_2CH_2OH$ at 1 atm and 25°C:
Show your work below for full credit.

ΔE = _______________ ΔH = _______________ w = ________________

7. Use literature values of enthalpy of formation to calculate ΔH_{rxn} for the balanced combustion reaction in question #1. Use this as the theoretical value.

8. Calculate a % error for this experiment using ΔH_{rxn} values from problems 6 and 7 above.

9. Why is 1 mL of D.I. water added to the bottom of the bomb chamber?