

Prelab #8—Is Enthalpy a State Function?

Name _____

Lab section: M T W Th F

1) In the space available, define the following terms in **your own words**:

- Enthalpy _____

- State Function _____

- Hess's Law _____

- calorimeter _____

- heat capacity _____

- specific heat _____

- accuracy _____

- precision _____

- absolute uncertainty _____

- relative uncertainty _____

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- 2) What will you be measuring (not calculating, but actually measuring) in lab? What instrument will you use to perform your measurements?

- 3) Show how reactions 2-4 in the lab manual can be combined to form reaction 1. Show how their enthalpies add up to the enthalpy of reaction 1, according to Hess's Law (rather than numbers, use the terms ΔH_1 , ΔH_2 , etc.). Put stars next to the reactions that you will be performing in lab.

- 4) What will you be able to determine from your calculated ΔH_1 value for reaction 1? (i.e. Why are we doing this lab?)

- 5) Hypothesis. What order of magnitude do you expect ΔT to be (e.g. hundredths, single digits, hundreds)? Indicate units.

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6) Practice calculations with uncertainty (report absolute uncertainty):

a) $P = 378.01 \pm 0.06$

$Q = 3.09 \pm 0.02$

$P - Q = \underline{\hspace{2cm}} \pm \underline{\hspace{2cm}}$

b) $A = 56 \pm 4$

$B = 0.345 \pm 0.005$

$A \times B = \underline{\hspace{2cm}} \pm \underline{\hspace{2cm}}$

c) $X = 37.65 \pm 0.01$

$Y = 3849 \pm 2$

$Z = 170 \pm 50$

$(XY) + Z = \underline{\hspace{2cm}} \pm \underline{\hspace{2cm}}$

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7) Complete the [Precision and Accuracy Tutorial](#). For each of the four graphs shown below, a vertical line indicates the correct value. The curve indicates the distribution of measured values. For each graph, circle HIGH or LOW for both precision and accuracy.

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|---------------|------|-----|-----------|------|-----|
| a) Precision: | HIGH | LOW | Accuracy: | HIGH | LOW |
| b) Precision: | HIGH | LOW | Accuracy: | HIGH | LOW |
| c) Precision: | HIGH | LOW | Accuracy: | HIGH | LOW |
| d) Precision: | HIGH | LOW | Accuracy: | HIGH | LOW |

