

## Unit 4 Review Sheet

1. What is the law of conservation of energy?
2. Define
  - a. Heat
  - b. Temperature
  - c. Thermochemistry
  - d. Exothermic reaction
  - e. Endothermic reaction
  - f. Enthalpy
  - g. Hess' Law
  - h. Calorimetry
  - i. Heat Capacity
  - j. Specific Heat
  - k. Entropy
3. What three things does enthalpy depend upon?
4. What is the formula for enthalpy change?
5. What is sign for  $\Delta H$  in endothermic reactions? Exothermic reactions?
6. Is heat a reactant or product in endothermic reactions? Exothermic reactions?
7. Using the equation and its  $\Delta H$ , determine the amount of energy transferred as a result of the reaction that starts with 250g of nitrogen dioxide.



8. What are the rules for manipulating equations for Hess' Law?
9. Find the  $\Delta H$  for the reaction below, given the following reactions and subsequent  $\Delta H$  values:  
 $2\text{C}_2\text{H}_4\text{O(l)} + 2\text{H}_2\text{O(l)} \rightarrow 2\text{C}_2\text{H}_6\text{O(l)} + \text{O}_2\text{(g)}$   
 $\text{C}_2\text{H}_6\text{O(l)} + 3\text{O}_2\text{(g)} \rightarrow 2\text{CO}_2\text{(g)} + 3\text{H}_2\text{O(l)} \quad \Delta H = -685.5 \text{ kJ}$   
 $\text{C}_2\text{H}_4\text{O(l)} + 5/2\text{O}_2\text{(g)} \rightarrow 2\text{CO}_2\text{(g)} + 2\text{H}_2\text{O(l)} \quad \Delta H = -583.5 \text{ kJ}$
10. What two things is the heat capacity of a substance based upon?
11. What is the specific heat for water?
12. What is the formula for heat transfer and what does each variable in the formula represent?
13. What does it mean for a reaction to be spontaneous?
14. What do the signs for  $\Delta S$  and  $\Delta H$  mean for spontaneity?
15. What is activation energy and what types of body chemicals lower activation energy for our internal chemical reactions?
16. Calculate the heat change involved when 2.00 L of water is heated from 20.0°C to 99.7°C.
17. Calculate the specific heat capacity of titanium if a 43.56 g sample absorbs 0.476kJ as its temperature changes from 20.13°C to 41.06°C.
18. Calculate the  $\Delta H$  if 5.8 g  $\text{NH}_4\text{NO}_3$  dissolves in 60.0 g of water and the temp drops from 21.0 °C to 16.9°C.

