

Name: _____

Date: _____

Chemistry
Thermochemistry WS 4 - Thermochemical Equations

Perform the following calculations, showing all work and reporting your answers with the **correct sign**:

1. For the following reaction:



- a. Calculate the heat change for the reaction of 37.8 g sulfur dioxide in excess oxygen.
- b. Will the temperature of the surroundings increase or decrease as a result of this reaction? Why?

- 2 For the following reaction:

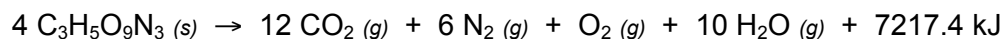


- a. Calculate the heat change for the formation of 195.0 g nitrogen dioxide from nitrogen gas and oxygen gas.
- b. Will the temperature of the surroundings increase or decrease as a result of this reaction? Why?

3. Butane (C_4H_{10}) releases 2877 kJ per mole during a standard combustion reaction in air.

- a. What is the balanced thermochemical equation for this reaction?
- b. How much heat will be released when 200.0 g of butane is burned?

4. The following equation shows the reaction that occurs when nitroglycerine explodes:

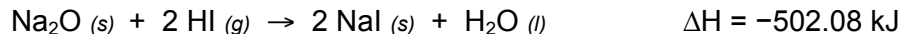


How much energy will be given off by detonating exactly 1 pound (454 grams) of nitroglycerine?

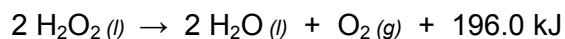
5. Calculate the change in energy when 92.6 g sodium bicarbonate breaks down in the following reaction:



6. Calculate the energy released when 24.8 g Na_2O reacts in the following reaction:



7. The following equation shows the reaction that occurs when hydrogen peroxide decomposes:



- a. Is this an endothermic or exothermic reaction? Why?
- b. Calculate the energy transfer involved in the decomposition of 250.0 mL of hydrogen peroxide ($D_{\text{H}_2\text{O}_2} = 1.4 \text{ g/mL}$).