

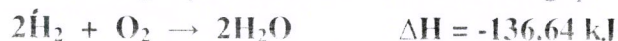
**ENTHALPY ( $\Delta H$ ) WS\_K**

**DETERMINE IF THE FOLLOWING DESCRIPTIONS ARE EXOTHERMIC (exo) OR ENDOTHERMIC (endo).**

- Exo 1. Reaction releases heat  
Exo 2. Products have more enthalpy (heat) than reactants  
Endo 3.  $\Delta H$  is a (+) value  
Endo 4. Reactants have more enthalpy (heat) than products.  
Exo 5.  $\Delta H$  is a (-) value.  
Endo 6. Reaction absorbs heat.

**ANSWER THE FOLLOWING QUESTIONS AND PERFORM THE FOLLOWING CALCULATIONS.**

7. Write the formula for calculating  $\Delta H = \sum H(\text{products}) - \sum H(\text{reactants})$   
 8. The  $\Delta H_f$  for an element is 0 kJ/mole.  
 9. Using the following equation, answer the following questions.



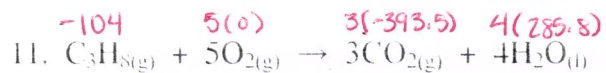
- exo a. The reaction is (exothermic, endothermic)  
-68.32 b. The  $\Delta H$  = how many kJ per one mole of water formed?  
↑ c. The temperature of the surrounding will (increase, decrease).

10. Using the following equation, answer the following questions.



- endo a. This reaction is (exothermic, endothermic)  
31.39 b.  $\Delta H$  = ? kcal  
R c. Which has more enthalpy (products, reactants)?

USING THE CHART GIVEN BELOW, FIND THE  $\Delta H_{\text{REACTION}}$   
AND WRITE THE ANSWER IN THE BOX.



$$\Delta H = \sum H(\text{P}) - \sum H(\text{R})$$

$$\Delta H = (3(-393.5) + 4(285.8)) - (-104 + 5(0))$$

$$\Delta H = -2323.7 - 104 = -2219.7 \text{ kJ/mole}$$

-2219.7 kJ/mole

exo



$$\Delta H = \sum H(\text{P}) - \sum H(\text{R})$$

$$\Delta H = (2(-393.5) + (-285.8)) - (2(227) + 5(0))$$

$$\Delta H = -1072.8 - 454 = -1526.8 \text{ kJ/mole}$$

-1526.8 kJ/mole

exo



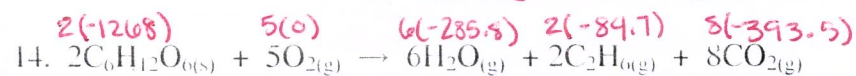
$$\Delta H = \sum H(\text{P}) - \sum H(\text{R})$$

$$\Delta H = (2(-285.8)) - (2(0) + 0)$$

$$\Delta H = -571.6 - 0 = -571.6 \text{ kJ/mole}$$

-571.6 kJ/mole

exo



$$\Delta H = \sum H(\text{P}) - \sum H(\text{R})$$

$$\Delta H = (6(-285.8) + 2(-84.7) + 8(-393.5)) - (2(-1268) + 0)$$

$$\Delta H = -5032.2 - (-2536)$$

$$\Delta H = -2496.2 \text{ kJ/mole}$$

-2496.2 kJ/mole

exo

■	$\text{C}_3\text{H}_8(\text{g}) = -104 \text{ kJ/mole}$
■	$\text{C}_2\text{H}_2(\text{g}) = 227 \text{ kJ/mole}$
■	$\text{C}_2\text{H}_6(\text{g}) = -84.7 \text{ kJ/mole}$
■	$\text{C}_6\text{H}_{12}\text{O}_6(\text{s}) = -1268 \text{ kJ/mole}$
■	$\text{O}_2(\text{g}) = 0 \text{ kJ/mole}$
■	$\text{H}_2(\text{g}) = 0 \text{ kJ/mole}$
■	$\text{CO}_2(\text{g}) = -393.5 \text{ kJ/mole}$
■	$\text{H}_2\text{O}(\text{l}) = -285.8 \text{ kJ/mole}$