

Name: _____

Date: _____

Notes: Heat and the Enthalpy of Reaction

Define the **Law of Conservation of Energy**: _____

What happens during all reactions? _____

What types of energy are usually absorbed or released? _____

What happened if the energy of system *decreased*? _____

What happened if the energy of system *increased*? _____

Define **exothermic reaction**: _____

Define **endothermic reaction**: _____

What do all chemical reactions require? _____

Define **activation energy** (E_A): _____

Define **enthalpy**: _____

What is the **change in enthalpy** (ΔH) equal to for a chemical reaction?

What is the **enthalpy of formation** (ΔH_f°)? _____

What is **enthalpy of formation** also called? _____

$$\text{Enthalpy of reaction} = \left(\begin{array}{c} \text{enthalpy} \\ \text{of products} \end{array} \right) - \left(\begin{array}{c} \text{enthalpy} \\ \text{of reactants} \end{array} \right) \quad \Delta H = \Delta H_f^\circ(\text{products}) - \Delta H_f^\circ(\text{reactants})$$

Where are the **products** found in a chemical equation? _____

Where are the **reactants** found in a chemical equation? _____

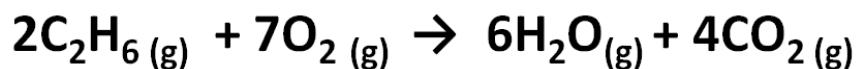
Important Facts:

What do you have to do since all ΔH_f° values are given in kilojoules per mole (kJ/mol)?

What should you pay special attention to? _____

What is the heat of formation (ΔH_f°) of **ALL** elements? _____

What are the 7 diatomic elements? _____



$\text{C}_2\text{H}_6(\text{g})$	$\Delta H_f = -83.85 \text{ kJ/mol}$
$\text{C}_3\text{H}_8(\text{l})$	$\Delta H_f = -104.7 \text{ kJ/mol}$
$\text{H}_2\text{O}(\text{l})$	$\Delta H_f = -285.830 \text{ kJ/mol}$
$\text{H}_2\text{O}(\text{g})$	$\Delta H_f = -241.818 \text{ kJ/mol}$
$\text{CO}_2(\text{g})$	$\Delta H_f = -393.509 \text{ kJ/mol}$

Products = _____

Products = _____

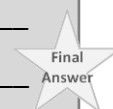
Reactants = _____

Reactants = _____

$\Delta H = \text{Products} - \text{Reactants}$

$\Delta H =$ _____

$\Delta H =$ _____



Products = _____

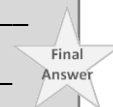
Products = _____

Reactants = _____

Reactants = _____

$\Delta H =$ _____

$\Delta H =$ _____



Products = _____

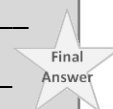
Products = _____

Reactants = _____

Reactants = _____

$\Delta H =$ _____

$\Delta H =$ _____



How can you tell if a reaction is exothermic or endothermic based on the ΔH value?

Exothermic: _____

Endothermic: _____