Name: _____ Period: ____

Guided Notes: Hess's Law & Heat of Formation

Hess's Law:

- Hess's Law- the overall enthalply change in a reaction is equal to the sum of the enthalpy changes of individual steps
- Example:

1. $2S_{(s)} + 2O_{2(g)} \rightarrow 2SO_{2(g)}$ $\Delta H = -594$ kJ
2. $2SO_{2(g)} + O_{2(g)} \rightarrow 2SO_{3(g)}$ $\Delta H = -198$ kJ

Standard Heat of Formation

- ΔH_f - the amount of energy _____ when a compound is formed from its _____
  - For example: $H_{2(g)} + ½\ O_{2(g)} \rightarrow H_2O_{(l)}$
- The standard heat of formation for water, $\Delta H_f = -285.83$kJ/mol
- Page _____ in your book is a table of standard heats of formation
- We use this information to determine the heat of formation for any reaction
- How?
  - ΔH°_{rxn}= _____ (_____)- _____(_____)

Practice Problems:

- $\Delta H^\circ_{rxn} = \Sigma \Delta H^\circ_f$ (products)- ΔH°_f(reactants)
- All elements in their standard states (example: oxygen gas, solid copper, liquid mercury) will have an Enthalpy of formation of _____.
- $4\ FeS_{(s)} + 7\ O_{2(g)} \rightarrow 2\ Fe_2O_{3(s)} + 4\ SO_{2(g)}$ $\Delta H_{rxn} = ?$

Check For Understanding

- Calculate the ΔH_{rxn} for the following using the heats of formation on pg. 975 in your book.

$CH_{4(g)} + 2Cl_{2(g)} \rightarrow CCl_{4(l)} + 2H_{2(g)}$