NAME: **HONORS CHEMISTRY**

SECTION: Hess’ Law: Enthalpy of Formation

In a formation reaction, one mole of the substance is synthesized from its elements in their standard states. The enthalpy change of such a reaction is the “enthalpy of formation.”

 Ex. H2(g) + ½ O2(g) → H2O(l) $∆H\_{f}^{o}$=-285.9 kJ

Free elements in their standard state have zero enthalpy. Table A-6 in the appendix of your textbook has the thermodynamic values. We can use enthalpy of formation data to find the enthalpy of reactions.

Ho(rxn) = nHfo(products) – mHfo(reactants)

 Where n represents the coefficients for the products, and

 m represents the coefficients for the reactants

1. Find the enthalpy of reaction for:

 H2O(l) + SO3(g) → H2SO4(aq)

1. Find the enthalpy of reaction for:

 BaCl2(aq) + H2SO4(aq) → BaSO4(cr) + 2HCl(aq)

1. What is the heat of reaction for 2HF(g) → H2(g) + F2(g)
2. Find the heat of combustion for ethane, C2H6 (g). (Start with a balanced equation. Liquid water is formed in this reaction.)
3. Consider the following reaction: Ca(OH)2(cr) → CaO(cr) + H2O(l) $∆H\_{f}^{o}$ = +66 kJ

Calculate $∆H\_{f}^{o}$ for CaO(cr).