Participation Assignment CHEM 1090-General Chemistry I

Name: #12

Section: 32, TR Due Date: Tuesday 11/13/2018

1. The first reaction in the steam methane reforming process is as follows:

$$CH_4(g) + H_2O(g) \rightarrow CO(g) + 3 H_2(g)$$
 $\Delta H^0 = +206.0 \text{ kJ}$

Write the chemical equation and the standard enthalpy value for the reaction of 2 moles of methane, CH₄.

- 2. The reverse of the reaction in #2 is sometimes called a methanation reaction. Write the chemical equation for the reverse reaction and also the standard enthalpy value for the production of 1 mole of methane.
- 3. Calculate the standard enthalpy of reaction for the following reaction:

$$2 C(s) + H_2(g) \rightarrow C_2H_2(g)$$
 $\Delta H^o = ? kJ$

Using only the following information:

$$2 C_2H_2(g) + 5 O_2(g) \rightarrow 4 CO_2(g) + 2 H_2O(l) \Delta H^o = -2598.8 \text{ kJ}$$

$$C(s) + O_2(g) \rightarrow CO_2(g)$$
 $\Delta H^{\circ} = -393.5 \text{ kJ}$

$$2 H_2(g) + O_2(g) \rightarrow 2 H_2O(l)$$
 $\Delta H^{\circ} = -571.6 \text{ kJ}$