Name _____ Period _____

AP Chemistry Test
Chapter 6 Thermochemistry

All questions are worth 25 points each.

1) Find $\Delta H°$ for making chloroform ($CHCl_3$) from methane

$$CH_4(g) + 3Cl_2(g) \rightarrow CHCl_3(l) + 3HCl(g)$$

using the following equations:

$^1/_2\ H_2(g) + {}^1/_2\ Cl_2(g) \rightarrow HCl(g)$ $\Delta H° = -92.31$ KJ
$C(s) + 2H_2(g) \rightarrow CH_4(g)$ $\Delta H° = -74.81$ KJ
$C(s) + {}^1/_2\ H_2(g) + {}^3/_2\ Cl_2(g) \rightarrow CHCl_3(l)$ $\Delta H° = -134.47$ KJ

?2) For the reaction:

$$H_2(g) + F_2(g) \leftrightarrows 2HF(g) \qquad \Delta H^o = -544\text{kJ}$$

The Bond Energies are:

H-H 432 KJ/mol F-F 154 KJ/mol

What is the bond energy of a HF Bond?

?3) For the reaction:

$$2NO(g) + O_2(g) \leftrightarrows 2NO_2(g) \qquad \Delta H^o = -114.14 \text{ kJ}$$

If the heat of formation for $NO_2(g)$ is 33.2 kJ and the for O2(g) is zero what is the heat of formation for NO(g)?

4)You have a calorimeter whose constant is 50 J/°C. It holds some water at 25.0°C. To this you add 50.0 g of copper that is at 100.0°C. The resulting mixture ends at a final temperature of 26.29°C. What is the heat capacity of the copper?