Additional Problems for Exam #1

1. When water boils in a pressure cooker the vapor pressure of water is 1450 mmHg. Assuming $\Delta H^{\circ}_{vap}$ is 40.7 $kJ \cdot mol^{-1}$ calculate the temperature of the water in the pressure cooker.

2. The $\Delta H^{\circ}_{vap}$ for mercury liquid is 59.4 $kJ \cdot mol^{-1}$ and its normal boiling point is 357 $^{\circ}C$. Calcualte the vapor pressure of mercury at 25 $^{\circ}C$.

3. Carbon tetrachloride has a vapor pressure of 200. mmHg at 37.5 $^{\circ}C$ and 450. mmHg at 58.2 mmHg. Calculate the $\Delta H^{\circ}_{vap}$ of carbon tetrachloride.

4. Can $MgCl_2$ have the same structure as NaCl? Explain.

5. Diamond has the same structure as SiC which is shown in Fuigure 12.33 on page 449 in your text. Describe this structure assuming all of the atoms are the same. How many carbon atoms in the unit cell? The edge length is 3.567 Å, calculate the density of diamond.

6. The density of NiO is 6.806 $g \cdot cm^{-3}$ and the edge length of the cube is 4.177 Å. Calculate the mass of the unit cell. How many formula units are in the unit cell?