CHM 1010 **GAGE**

REVIEW PROBLEMS FOR SOLIDS AND LIQUIDS

1. For each of the following pairs of compound below, determine which one will have the higher boiling point and explain why.

   a. NCl_3 and NBr_3
   b. CH_3 - C - OH and CH_3-CH_2- C-H
      \\ \\
      O O
   c. Li_2SO_3 and SO_3

2. Explain and illustrate where appropriate the types of interactions between the following molecules:
   a. NH_3 and H_2O
   b. $CH_3CH_2CH_2CH_3$ and CCl_4
   c. Na_3PO_4 and H_2O
   d. $CH_3CH_2CH_2CH_3$ and H_2O

3. Explain the following statements:
   a. Water is extremely efficient at cooling the human body down.
   b. Water (molar mass = 18.0 g/mol) is a liquid at room temperature while hydrogen sulfide (molar mass = 34.1 g/mol) is a gas.
   c. Why is water a liquid at room temperature while ammonia is not?
   d. As you boil water you notice bubbles at 30^{o}C and more at 100^{o}C. What are the bubbles in each case? Explain why you see them.
   e. Do you want a throat medication to have a high or low surface tension? Explain.

4. Based on the descriptions below, classify each solid as: molecular; network; ionic; amorphous; or metallic. Explain why.

   a. A soft, slippery solid that has no definite melting point but decomposes at temperatures above 250^{o}C and does not conduct electricity.
   b. A hard solid that melts at 3410^{o}C; both the solid and liquid state conduct electricity.
   c. Violet crystals that melt at 114^{o}C; its vapors irritate the nose; neither the solid nor liquid conducts electricity.
   d. Hard, colorless crystals that melt at 2800^{o}C; the liquid conducts electricity but the solid does not.

5. Predict whether the following substances will have high or low melting and boiling points and explain why:

   O_2 potassium chloride
   diamond carbon dioxide

Answers:

1. NBr_3, $CH_3C(O)OH$, Li_2SO_3
2. Dipole, dispersion, ion-dipole, dispersion
4. Amorphous, metallic, molecular, ionic
5. Low, high, high, low