CH 222
Sample Quiz #4   Name: _____   Lab Section: _____

Be sure to show all work, use the correct number of significant figures, circle final answers and use correct units in all problems.

1.   Fill in the blanks using the following species: (1 point each, 8 points total)

$$MgO(s), O_2(aq), NH_3(l), CHCl_3(l), Kr(g), Mg^{2+}(aq)$$

   a.   Which species will have no appreciable intermolecular forces?   ___

   b.   Which species will exhibit hydrogen bonding in the liquid state?   ___

   c.   Which species will have the highest melting point?   ___

   d.   Which has the lowest normal boiling point?   ___

   e.   Will species exhibits the ion-dipole force?   _____

   f.   Which species exhibits the dipole-dipole force?   _____

   g.   Which species exhibits the dipole-induced dipole force?   _____

   h.   Which species allows fish to breathe underwater?   _____

2.   The molar enthalpy of vaporization for 2-pentanol is 46.26 kJ/mol at 71.0 ˚C, and the density is 0.9884 g/cm³. How much energy is required to evaporate 2.25 L of 2-pentanol? (5 points)

3.   What are the three standard cubic unit cells? How many net atoms per cell? Sketch each cell. (4 pts)

4.   Calculate the density of aluminum metal if it forms a face centered cubic unit cell and the radius of the aluminum atom is 1.43 * 10⁻⁸ cm. (4 points)

Be sure to show all work, use the correct number of significant figures, circle final answers and use correct units in all problems.

1.   Fill in the blanks using the following species: (1 point each, 8 points total)

$MgO(s)$, $O_2(aq)$, $NH_3(l)$, $CHCl_3(l)$, $Kr(g)$, $Mg^{2+}(aq)$

   a.   **Kr**

   b.   **NH₃**

   c.   **MgO**

   d.   **Kr**

   e.   **Mg²⁺(aq)**

   f.   **CHCl₃**

   g.   **O₂(aq)**

   h.   **O₂(aq)**

2.   The molar enthalpy of vaporization for 2-pentanol is 46.26 kJ/mol at 71.0 ˚C, and the density is 0.9884 g/cm³. How much energy is required to evaporate 2.25 L of 2-pentanol? (4 points)

   1170 kJ

3.   What are the three standard cubic unit cells? How many net atoms per cell? Sketch each cell. (4 pts)

   simple cubic: 1 atom per cell
   body centered cubic: 2 atoms per cell
   face centered cubic: 4 atoms per cell
   pictures of the cells can be found in the text

4.   Calculate the density of aluminum metal if it forms a face centered cubic unit cell and the radius of the aluminum atom is $1.43 * 10^{-8}$ cm. (4 points)

   2.70 g/cm³