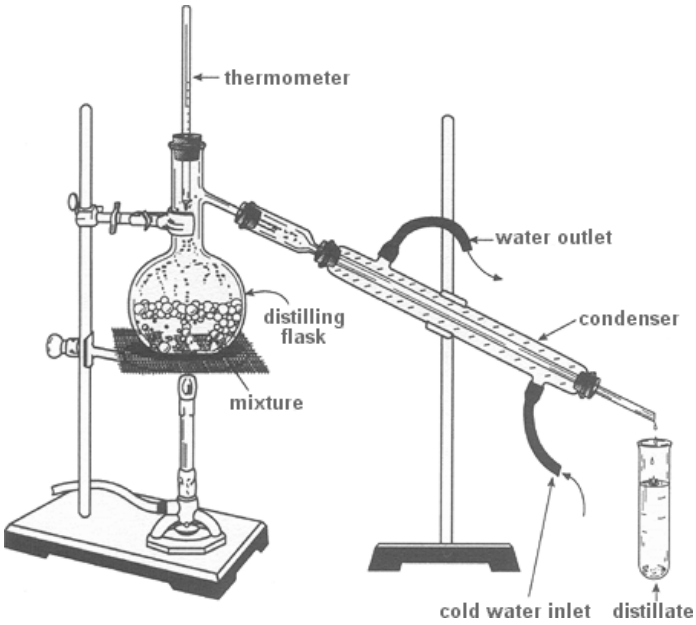
**Quiz: Ch 10 & 11** **Name:**
**Version I (32 pts)** **I have not received or given, nor will give any aid on this exam.**
**AP Chemistry** **December 13, 2004** **Period: 5 6 7**

1. (16 pts) Distillation is the process in which a mixture of two or more substances is separated into its component chemicals first by heating then cooling the produced vapors with water. A mixture of chemicals has been added to a distillation apparatus, as shown below. As the temperature is slowly raised, the chemicals begin to vaporize.




   a. (4 pts) The following substances are present in the original mixture; draw the Lewis structures of each:
   Argon

   Butane

   Propane

   1-propanol

   b. (8 pts) Identify <u>all</u> the "intermolecular forces" present in each of the following compounds.

   Argon

   Butane

   Propane

   1-propanol

   c. (4 pts) Write a "1" by the substance that will come out of the distillation apparatus first, a "2" by the second, a "3" by the third, and a "4" by the substance that will come out last.

   ___ Argon

   ___ Butane

   ___ Propane

   ___ 1-propanol

2. (8 pts) The other day, I noticed my bike tires were a bit low. As I was filling them with a pump, I considered what I knew about gases, and that pressure and volume are inversely proportional. However, I noticed that, using the pump, I was increasing *both* the pressure and the volume of the tires.
    a. (4 pts) In terms of the kinetic-molecular theory, describe in 2-3 sentences and using pictures why the pressure of a gas increases with a decrease in volume.

    b. (4 pts) What is wrong with the logic described in the above story?

3. (8 pts) Consider three identical flasks filled with different gases:
    Flask A: CO at 760 torr and 0°C
    Flask B: $N_2$ at 250 torr and 0°C
    Flask C: $H_2$ at 100 torr and 0°C

    a. (2 pts) Which substance is the least ideal? Briefly explain in 1-2 sentences.

    b. (4 pts) In which flask will the particles have the greatest average kinetic energy? Briefly explain in 1-2 sentences.

    c. (4 pts) In which flask will the particles (atoms, molecules, etc) have the greatest average velocity? Briefly explain in 1-2 sentences.

**Quiz: Ch 10 & 11** **Name:**
**Version J (32 pts)** **I have not received or given, nor will give any aid on this exam.**
**AP Chemistry** **December 13, 2004** **Period: 5 6 7**

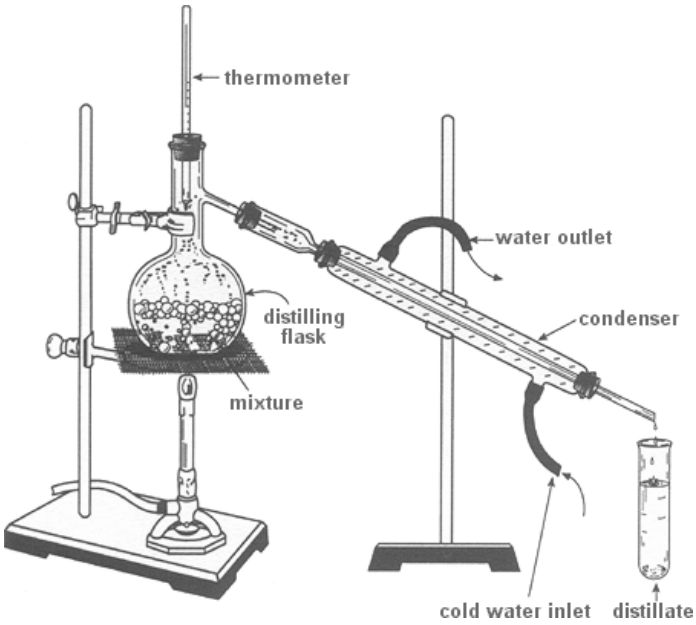
1. (16 pts) Distillation is the process in which a mixture of two or more substances is separated into its component chemicals first by heating then cooling the produced vapors with water. A mixture of chemicals has been added to a distillation apparatus, as shown below. As the temperature is slowly raised, the chemicals begin to vaporize.

   a. (4 pts) The following substances are present in the original mixture; draw the Lewis structures of each:
   Hexane

   Krypton

   Pentane

   1-pentanol




   b. (8 pts) Identify <u>all</u> the "intermolecular forces" present in each of the following compounds.
   Hexane

   Krypton

   Pentane

   1-pentanol

   c. (4 pts) Write a "1" by the substance that will come out of the distillation apparatus first, a "2" by the second, a "3" by the third, and a "4" by the substance that will come out last.

   ___ Hexane

   ___ Krypton

   ___ Pentane

   ___ 1-pentanol

2. (8 pts) In terms of the kinetic-molecular theory,
   d. (4 pts) Describe in 2-3 sentences and using pictures why the volume of a gas increases with a increase in temperature.

   e. (4 pts) The other day, I was pumping up my bike tires. After checking the pressure with a gauge, I realized I had over-inflated them, and began to let air out of the tires. As I was deflating them, I considered what I knew about gases, and that pressure and volume are inversely proportional. However, I noticed that, as I let air escape from the tire, I was decreasing *both* the pressure and the volume of the tire. What is wrong with the logic described in this story?

3. (8 pts) Consider three identical flasks filled with different gases:
   Flask A: $PH_3$ at 760 torr and 25°C
   Flask B: $F_2$ at 450 torr and 25°C
   Flask C: Ne at 200 torr and 25°C

   d. (2 pts) Which substance is the least ideal? Briefly explain in 1-2 sentences.

   e. (3 pts) In which flask will the particles (atoms, molecules, etc) have the greatest average kinetic energy? Briefly explain in 1-2 sentences.

   f. (3 pts) A very small hole is poked in the lids sealing each flask. From which flask will the particles effuse most quickly? Briefly explain in 1-2 sentences.