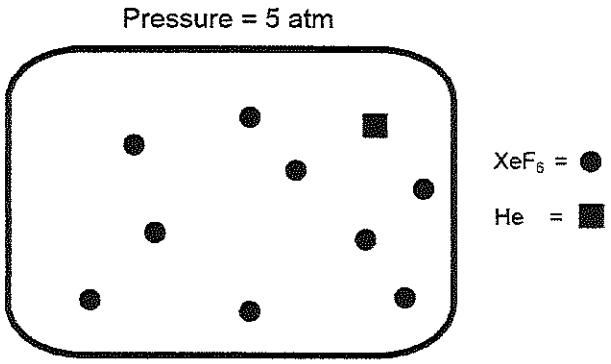
A8

Preliminary quiz 5

Multiple Choice
Identify the choice that best completes the statement or answers the question.



___ 1. (#4-3a) If the particles above ~~are~~ are non-ideal the following is true
I. The particles are attracting/repelling each other.
II. The temperature is likely very high.
(a.) I only
b. Neither I or II
c. II only
d. Both I and II

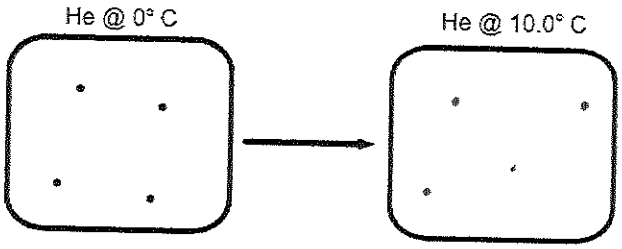
____ 2. (#4-3b) The temperature of the above container is 298K. Which of the following is true?
I. XeF_6 is traveling faster than the He on average NO
II. All the helium atoms have the same speed. NO
III. The partial pressure of XeF_6 = 0.5 atm. Y
a. I only
b. I and II
(c.) III only
d. I, II and III

____ 3. (#4) CCl_4 in the gaseous state condenses to a liquid with very little pressure. Which of the following is a correct explanation of why.

a. Hydrogen bonding causes increased attraction at pressure is increased
b. The gas is a non-ideal gas therefore at higher pressures it condenses.
(c.) London dispersion forces cause the condensation to a liquid
d. Coulombic repulsions cause the condensation.

____ 3. (#4-3c) a 22.4 liter rigid container contains a small amount of liquid CCl_4 on the bottom and vaporous CCl_4 is in the air above the liquid at 380mmHg and 0 C. How many moles of gas are present above the liquid?
a. 1 mol
b. 0.75 mol
(c.) 0.50 mol
d. 0.25 mol

760 +0°C = 1 mol
so 380 = ½ mol



The container has a volume of 2.2 liters and an original pressure of 1.0atm.

1. (#4-3c1) Calculate how many moles of gas are located in the 1st container (left most)?

22.4L = 1 mol so 2.2L = 0.1 mol

2. (#4-3c2) Student hypothesis: The helium container is heated to 10° C, will have a pressure equaling 2ATM. Justify or nullify the student hypothesis.

to double 10
283 → 566K
↑ must double temp

3. (#4-3b) In the containers to the right, draw a representative proportional particulate diagram.

4. $NI_{3(s)}$ decomposes to elements $I_{2(g)}$ and $N_{2(g)}$. This reaction will take place spontaneously. If 39.7 grams of NI_3 (molar mass : 397g/mol) is decomposed and trapped in a 1L container at 273Kanswer the following questions.

a) Write the decomposition reaction and balance it. $2NI_3 \rightarrow N_2 + 3I_2$
b) (#4-3c3) Determine the partial pressure of each gas and the total pressure.
c) (#4-4) If this gas was collected over water, how would this pressure change? Explain.

$$39.7\,g \cdot \frac{1\ mol}{397\,g} = 0.1\,mol \cdot \frac{4\ \text{gas particles}}{2\,NI_3} = 0.4\ \text{gas particles}$$

$PV = nRT$

$$P = \frac{nRT}{V} \qquad \frac{0.4\,mol \cdot 0.0821 \cdot 273}{1L} = 8.9\,atm$$

P_{N_2} $.25 \cdot 8.9 = 2.24\,atm$

P_{I_2} $.75 \cdot 8.9 = 6.67\,atm$