/45

AP Chemistry – Gases, Gases Everywhere – 23

Name _____Per ___

1. (a)Convert 0.357 atm to torr.

(b) Convert 6.6×10^{-2} torr to atm.

(c) Convert 147.2 kPa to torr.

2. A gas is confined to a chamber with a piston at its top. Consider the following changes:
(a) Heat the gas from 298 K to 360 K, while maintaining the present position of the gas.
(b) Move the piston to reduce the volume of gas from 1 L to 0.5 L.
(c) Inject additional gas through the gas inlet valve.

Indicate (yes or no) whether each of these changes will:
1. Decrease the average distance between molecules.
2. Increase the pressure of the gas.
3. Increase the total mass of the gas in the cylinder.
4. Increase the number of moles of gas present.

(a)	(b)	(c)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.

3. Calcium carbonate is decomposed upon heating to give calcium oxide and carbon dioxide. A sample of calcium carbonate is decomposed, and the carbon dioxide is collected in a 250 mL flask. After the decomposition is complete, the gas has a pressure of 1.3 atm at a temperature of 31 ^{o}C. How many moles of CO_2 gas were collected?

4. Tennis balls are usually filled with air or N_2 gas to a pressure above atmospheric pressure to increase their "bounce". If a particular tennis ball has a volume of 144 cm^3 and contains 0.33 g of N_2 gas, what is the pressure inside the ball at 24°C?

5. A gaseous mixture made from 6.00 g O_2 and 9.00 g CH_4 is placed in a 15.0 L vessel at 0°C. What is the partial pressure of each gas and what is the total pressure in the vessel?

6. A sample of $KClO_3$ is partially decomposed according to the equation below. This reaction produces O_2 gas that is collected over water. The volume of gas collected is 0.250 L at 26°C and 765 torr total pressure. (a) How many moles of O_2 are collected (b) How many grams of $KClO_3$ were decomposed? (HINT: The pressure of water vapor at 26°C is 25 torr)

$$2KClO_3(s) \rightarrow 2KCl(s) + 3O_2(g)$$