Gas Laws 2

Name: _____

1) Find the corresponding pressure for 50 kPa in atmospheres, torr and mm Hg.

2) Calculate the corresponding pressure in psi, Pa, mmHg and atm for 790 torr.

3) A constant volume of gas is heated from 25 $^{\circ}$C to 150 $^{\circ}$C. The initial pressure was 380 torr. What is the final pressure in atmospheres.

4) A gas is kept at constant pressure, and the volume is increased from 18cm^3 to 50 cm^3. The final temperature was measured to be 236 $^{\circ}$F. What was the initial temperature, in $^{\circ}$C.

5) A gas at constant volume is cooled to a final temperature of 76 K. The initial pressure was 76.0 kPa and the final pressure was 100 mm Hg. What was the initial temperature.

6) A gas at constant pressure is cooled to a temperature well below the freezing point of water. The initial volume was 90 ml. The temperature started at 50 $^{\circ}$C, and was cooled to -50 $^{\circ}$C. What was the final volume of the gas.

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7) A 13 L sample of oxygen gas has a pressure of .79 atm. What will be the new pressure if the volume is reduced to 500 mL?

8) What is the atmospheric pressure if the partial pressures of nitrogen, oxygen and argon are 602.3 mm Hg, 170.4 mm Hg, and 1.3 mm Hg, respectively?

9) What are the partial pressures of atmospheric gases if the atmospheric pressure is 754 torr and the atmosphere is made up of 78% nitrogen, 21% oxygen, 0.7% carbon dioxide, 0.2% neon, and 0.1% carbon monoxide?

10) Knowing that an gas at STP takes up 22.4 L per mole, how many moles are of a gas are present if you have 5.3 L of that gas?

11) A 25.0 mL sample of oxygen gas is cooled from 300 K to 241 K, while changing the pressure from 300 torr to 1000 torr. What is the new volume of the gas?

12) Helium will turn into a liquid at -452 ^{O}F. In order to make liquid He, one must cool it from STP down to this temperature and a pressure of 225 mm Hg. Suppose you started with one mole of the gas. What would the new volume be under these conditions?

Answers:
1) 0.49 atm, 375 torr, 375 mm Hg.   2) 15.3 psi, 105000 Pa, 790 mm Hg, 0.49 atm   3) 0.71 atm
4) -134 ^{O}C   5) 433 K   6) 62 mL   7) 20.5 atm   8) 774 mm Hg
9) N_2 - 588.1 torr, O_2 - 158.3 torr, CO_2 - 5.3 torr, Ne - 1.5 torr, CO - 0.8 torr
10) 0.24 mol   11) 6.0 mL   12) 1.11 L