Gas Problems Review

Name:

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1. A gas at constant temperature occupies a volume of 2.40 L and exerts a pressure of 110.0 kPa. What volume will the gas occupy at a pressure of 79.5 kPa?

2. What is the pressure of a gas that originally occupied 3.95 L at a pressure of 48.73 kPa, if the volume is increased to 5.43 L (assume the temperature is constant)?

3. At constant temperature, a gas that exerted a pressure of 1.44 atm and that occupied 1.58 L is compressed until its pressure is 6.29 atm. What is the final volume?

4. A gas at constant pressure occupies 0.400 L at 50.0^{o}C. What volume will it have at 300.0 ^{o}C?

5. A gas occupies 0.105 L at 100.0 K. At what temperature will its volume be 0.140 L.? Assume the pressure remains constant.

    a. What is the temperature in ^{o}C?

6. At 75.0^{o}C, a gas has a volume of 3.22 L. What volume will it occupy at 75.0 K, assuming pressure remains constant?

7. A gas at 300 K occupies 6.50 L at a pressure of 355 kPa. What will be its pressure at 250.0 K and a volume of 4.80 L?

8. At 120.0^{o}C, a gas exerts a pressure of 212 kPa when its volume is 0.495 L. If the temperature is raised to 240.0^{o}C, at what volume will the gas exert a pressure of 183 kPa?

9. A gas confined to a 515 cm^{3} container exerts a pressure of 107.4 kPa at 38.6^{o}C. At what temperature will it exert a pressure of 635.7 kPa if it is placed in a 644 cm^{3} container?

10. A gas sample occupies 319 cm^3 at 54.3^oC and a pressure of 87.4kPa. Calculate its volume at STP.

    a. If it has a mass of 7.02 g, what is its density at the new volume?

11. At 225 K, a gas sample in a 1.88 L container exerts a pressure of 108.8 kPa. What would be the volume at 345 K and at 68.3 kPa?

    a. If the gas has a mass of 1.00 g, what is its density at the new volume?

12. Calculate the relative rates of diffusion of nitrogen gas (N_2) and hydrogen gas (H_2)?

13. Calculate the relative rates of diffusion of methane gas (CH_4) and ammonia gas (NH_3)?

14. Calculate the relative rates of diffusion of gas A that has a density of 1.47×10^{-3} g/L and gas B that has a density of 7.33×10^{-3} g/L?

15. A gas sample occupies 30.8 L at a temperature of 325 K and a pressure of 149 kPa. Calculate the number of moles of gas that are present.

16. What pressure is exerted by 0.625 moles of a gas in a 45.4 L container at -24.0^oC?

17. At what temperature, will 11.8 moles of a gas exert a pressure of 592 kPa in a container that has a volume of 32.8 L?