Gas Calculations Practice

1. A gas sample occupies 300ml at a pressure of 2.00atm. what would the pressure be if the volume was increased to 500ml and the temperature remains constant?

2. A balloon is inflated with helium to a volume of 0.75L at 27°C. If the same balloon was placed in a room at 22°C, what would its new volume be?

- 3. The temperature of a 200ml sample of gas originally at STP is changed to -25°C at constant volume. Calculate the pressure of the gas in atm.
- 4. A gas has a volume of 240ml at 25°C at 600mm Hg. Calculate its volume at STP.

5. If 4 moles of a gas at a pressure of 5.4atm has a volume of 120L, what is the temperature?

My car has an internal volume of 2600L. If the sun heats my car from a temperature of 20°C to 55°C, what will the pressure be inside my car? Assume the pressure at 20°C was 760mm Hg

7. How many moles of gas are in my car in problem 3?

Individual Practice Problems

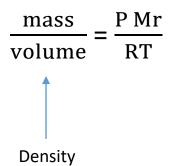
- 1. 3.00 moles of a gas are placed in a 4.55 L container at 245 °C. What is the pressure in kPa?
- 2. 65.85 grams of nitrogen gas are placed in 17.5 L container. The pressure is 1988 mm Hg. What is the temperature, in °C?
- 3. A 7.0 L container is filled with 10.0 moles of a gas. The pressure is read at 4.00 atm, what is the temperature of the gas?
- 4. 155.0 grams of oxygen gas are put in a 4.50 L container at 35 °C. What is the pressure, in kPa?
- 5. What volume would be occupied by 3.0 moles of nitrogen gas under a pressure of 12156 kPa at 50°C?
- 6. How many moles of a gas will occupy 900 mL at a pressure of 599.8 kPa and -73°C?

- 7. 2.50 grams of XeF₄ is introduced into an evacuated 3.00 L container at 80.0°C. Find the pressure in atmospheres in the container.
- 8. A lighter-than-air balloon is designed to rise to a height of 6 miles high with an atmospheric pressure of 210 mm Hg and the temperature is -40 °C. If the full volume of the balloon is 100,000.0 L, how many grams of helium will be needed to inflate the balloon?
- 9. What is the mass of 18.9 L of NH_3 at 31.0 °C and 97.97 kPa?
- 10. 0.279 moles of O_2 in a 1.85 L cylinder exert a pressure of 3.68 atm. What is the temperature in the cylinder?

11. If I initially have a gas at a pressure of 12 atm, a volume of 23 liters, and a temperature of 200 K, and then I raise the pressure to 14 atm and increase the temperature to 300 K, what is the new volume of the gas?

12. A gas takes up a volume of 17 liters, has a pressure of 2.3 atm, and a temperature of 299 K. If I raise the temperature to 350 K and lower the pressure to 1.5 atm, what is the new volume of the gas?

- 13. A gas that has a volume of 28 liters, a temperature of 45 0C, and an unknown pressure has its volume increased to 34 liters and its temperature decreased to 35 0C. If I measure the pressure after the change to be 2.0 atm, what was the original pressure of the gas?
- 14. A gas has a temperature of 14 0C, and a volume of 4.5 liters. If the temperature is raised to 29 0C and the pressure is not changed, what is the new volume of the gas?
- 15. If I have 17 liters of gas at a temperature of 67 0C and a pressure of 88.89 atm, what will be the pressure of the gas if I raise the temperature to 94 0C and decrease the volume to 12 liters?
- 16. I have an unknown volume of gas at a pressure of 0.5 atm and a temperature of 325 K. If I raise the pressure to 1.2 atm, decrease the temperature to 320 K, and measure the final volume to be 48 liters, what was the initial volume of the gas?
- 17. If I have 21 liters of gas held at a pressure of 78 atm and a temperature of 900 K, what will be the volume of the gas if I decrease the pressure to 45 atm and decrease the temperature to 750 K?
- 18. If I have 2.9 L of gas at a pressure of 5.0 atm and a temperature of 50.0 0C, what will be the temperature of the gas if I decrease the volume of the gas to 2.4 L and decrease the pressure to 3.0 atm?
- 19. I have an unknown volume of gas held at a temperature of 115 K in a container with a pressure of 60.0 atm. If by increasing the temperature to 225 K and decreasing the pressure to 30.0 atm causes the volume of the gas to be 29 liters, how many liters of gas did I start with?



20. What is the density of an ideal gas with a molecular mass of 50 g/mol at 2 atm and 27°C?

21. The density of SO_2 gas in a container 25°C is 2.51 g/L. Determine the pressure in this flask.

22. A 500.0 ml flask contained O2 gas at 25.0°C at a pressure of 4.5 atm.

- a. What is the number of moles in the flask?
- b. What is the mass of the gas in the flask?
- c. What is the density of the oxygen in the flask?

23. A 5.0 L flask of carbon dioxide gas at a pressure of 4.54 atm had a mass of 36 g?

- a. How many moles of gas are in this flask?
- b. What is the temperature, in Kelvin and °C, of the gas in this flask?

24. Determine the molar mass of gas in a container at -50.0 C and 6 atm pressure with a density of 14.5 g/L

25. Given 3.43 g of gas in a 2.00 L container at 25.0°C and a pressure of 1140 mm Hg:

- a. Determine the number of moles of gas in the container.
- b. Determine the molar mass of this gas.
- c. What might be the identity of this gas?