

CLE 3321.2.4 Investigate characteristics associated with the gaseous state.

SPI 3221.2.7 Predict how changes in volume, temperature, and pressure affect the behavior of a gas.

CLE 3221.3.3 Explore the mathematics of chemical formulas and equations.

SPI 3221.3.5 Convert among the following quantities of a substance: mass, number of moles, number of particles, molar volume at STP

Chemistry Gas Laws and Molar Volume at STP Review Worksheet

1. A balloon filled with oxygen gas occupies a volume of 5.5 L at 25 °C. What volume will the gas occupy at 100. °C?
2. The temperature within an automobile tire at the beginning of a long trip is 25 °C. At the conclusion of the trip, the tire has a pressure of 1.80 atm. What is the final Celsius temperature within the tire if its original pressure was 1.75 atm?
3. A helium-filled balloon contains 125 mL of gas at a pressure of 0.974 atm. What volume will the gas occupy at standard pressure?
4. The volume of a gas at 27.0 °C and 0.200 atm is 80.0 mL. What volume will the same gas sample occupy at standard conditions?
5. A sample of gas in a closed container at a temperature of 100. °C and a pressure of 2 280 mm Hg is heated to 300. °C. What pressure does the gas exert at the higher temperature?
6. A sample of nitrogen gas is contained in a piston with a freely moving cylinder. At 0.0 °C, the volume of the gas is 375 mL. To what temperature, in °C, must the gas be heated to occupy a volume of 500. mL?
7. What pressure, in atm, is required to reduce 60.0 mL of a gas at standard conditions to 10.0 mL at a temperature of 25.0 °C?
8. A weather balloon with a volume of 1.375 L is released from Earth's surface at sea level (standard atmospheric pressure.) What volume will the balloon occupy where the air pressure is 10.0 kPa?
9. A sample of ammonia contains 0.500 mol. What volume at STP would the gas occupy?
10. If a balloon filled with carbon dioxide gas occupies a volume of 31 L at STP, what is the mass of the gas?
11. Calculate the number of moles contained in 6.500 L of sulfur dioxide at STP.
12. What volume would a 200.0 g sample of hydrogen sulfide gas occupy at STP?

Gas Laws and Molar Volume at STP Review Worksheet Answer Key

1. 6.9 L
2. 34 °C
3. 122 mL
4. 14.6 mL
5. 3.50×10^3 mm Hg
6. 91 °C
7. 6.55 atm
8. 13.9 L
9. 11.2 L
10. 61 g
11. 0.290 mol
12. 131 L