

Name: _____

Block: _____

Gas Laws Problems

For each of the following problems, answer the question and state which of the gas laws (Boyle's Law, Charles' Law, Gay-Lussac's Law, and/or Avogadro's Principle) applies to it.

1. A sample of oxygen gas occupies a volume of 250. mL at a pressure of 740. torr. What volume will it occupy at 800. torr?
2. A sample of O₂ is at a temperature of 40.0°C and occupies a volume of 2.30 L. To what temperature should it be raised to occupy a volume of 6.50 L?
3. H₂ gas was cooled from 150.°C to 50.°C. Its new pressure is 750 mm Hg. What was its original pressure?
4. A 175 cm³ sample of H₂ at 1.50 atm had its pressure decrease to 713 torr. What is the new volume of the H₂ gas?
5. A sample of NH₃ has a pressure of 650. torr at 25.0°C. What pressure will it have if its temperature is increased to 95.0°C?

6. A sample of argon gas was cooled, and its volume went from 380. mL to 250. mL. If its final temperature was -45.0°C , what was its original temperature?

7. A 2.00 L container of N_2 had a pressure of 3.20 atm. What volume would be necessary to decrease the pressure to 98.0 kPa?

8. A sample of air has a volume of 60.0 mL at STP. What volume will the sample have at 55.0°C and 745 torr?

9. What pressure is needed to change 400. mL of a gas at 1.00 atm and 15.0°C to 300. mL at -30.0°C ?

10. N_2 gas is enclosed in a tightly stoppered 500. mL flask at 20.0°C and 760. mm Hg. The flask, which is rated for a maximum pressure of 3.00 atm, is heated to 680.0°C . Will the flask explode?

11. A scuba diver's 10. L air tank is filled to a pressure of 2.1×10^4 kPa at a dockside temperature of 32.0°C . If the diver uses air at the rate of 8.0 L/min at a depth of 10. m, where the pressure is 200. kPa (100 kPa due to the atmosphere plus 100. kPa due to the water pressure) and the temperature 8.0°C , how long can the diver remain safely submerged?