

Gas Law Worksheet II

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1. In a certain experiment a sample of helium in a vacuum system was compressed at 25 °C from a volume found to be 30.0 mm Hg. What was the original pressure of the helium?
2. A hydrogen gas volume thermometer has a volume of 100.0 cm³ when immersed in an ice-water bath and the hydrogen at the same pressure is 87.2 cm³. Find the temperature of the boiling point of chlorine in °C.
3. 2.50 grams of XeF₄ is introduced into an evacuated 3.00 liter container at 80.0 °C. Find the pressure in atm.
4. A lighter-than-air balloon is designed to rise to a height of 6 miles at which point it will be fully inflated. The temperature is -40 °C. If the full volume of the balloon is 100,000.0 L, how many kilograms of helium will it contain?
5. How many liters of pure oxygen, measured at 740 mm Hg and 24 °C, would be required to burn 1.00 mole of ethane (C₂H₆)? (Use the balanced equation, then use gas laws.)
6. Air from the prairies of North Dakota in winter contains essentially only nitrogen, oxygen, and argon: 78.0% N₂, 21.0% O₂, and 1.0% Ar. Find the partial pressures of each of these gases in a sample of air at 1.00 atm.
7. For a mole of ideal gas, sketch graphs of
 - a. P vs. V at constant T.
 - b. P vs. T at constant V.
 - c. V vs. T at constant P.
8. What would be the partial pressure of N₂ in a container at 50 °C in which there is 0.20 mole N₂ and 0.80 mole Ar at a total pressure of 1.00 atm?
9. What volume of Ne at one atm and 25.0 °C would have to be added to a sign having a volume of 25.0 L of Ar at one atm and 25.0 °C to give a total pressure of 1.50 atm?
10. Find the volume of a gas at 800.0 mm Hg and 40.0 °C if its volume at 720.0 mm Hg and 15.0 °C is 6.00 L.
11. 12.8 L of a certain gas are prepared at 100.0 kPa and -108 °C. The gas is then forced into an 855 mL container. What is the pressure of this gas in kilopascals?
12. In a laboratory experiment, 85.3 mL of a gas are collected at 24 °C and 733 mm Hg pressure. Find the number of moles of gas.
13. What is the mass of 18.9 L of NH₃ at 31.0 °C and 97.97 kPa?
14. 0.279 moles of O₂ in a 1.85 L cylinder exert a pressure of 3.68 atm. What is the temperature in the cylinder in °C?