

7. The pressure of the mercury in the gas (vapor) phase above the liquid mercury in a barometer is 2.0×10^{-3} mmHg. Calculate the pressure in units of atmospheres.
8. A sample of SF₆ occupies a container of variable volume. If the sample originally occupies a volume of 50.0 mL at 755 mmHg, calculate the pressure which must be exerted to lower the volume to 25.0 mL.
9. If the pressure of a sample of an ideal gas, initially at 1.25 atm, is tripled, by what factor will the volume of the gas change?
10. A 545 mL sample of nitrogen gas initially at -220°C is heated to 100°C. Calculate the new volume, assuming the pressure does not change.
11. Calculate the volume of 0.390 moles of an ideal gas at 750 mmHg and 23°C.
12. Calculate the density of SF₆ at 1.00 atm and 0.00°C.
13. Calculate the volume of a sample of helium at -33.0°C and 1.23 atm if it occupies a volume of 2.34 L at 54.5°C and 1026 mmHg.
14. A 0.751 mol sample of an ideal gas occupies a 10.0 liter flask at 27.0°C and 1.85 atm. If 0.257 mol of the gas are removed from the container, calculate the new pressure. (Assume the temperature remains constant.)
15. Which of the following contains the largest number of particles?
- 5.00 g of He at 1.00 atm and 0°C
 - 225 g of Au
 - 34.5 L of an ideal gas at -5.0°C and 2000 mmHg
16. Which of the following samples has the greater mass?
- 278 L of Ar at 25°C and 300 mmHg
 - 225 mL of CH₄ at 300°C and 5.34 atm
 - 34.5 L of Cl₂ at -5.0°C and 2000 mmHg
17. Calculate the total pressure in a 10.0 liter flask at 21°C which contains 4.00 g H₂, 12.0 g O₂ and 8.00 g He.
18. A common laboratory preparation of O₂ involved the decomposition of hydrogen peroxide, H₂O₂, according to the equation,



If 240 mL of O₂ at 23°C and at 0.965 atm pressure are collected over a sample of water at the same temperature determine the number of moles of O₂ obtained in the reaction.

19. In each of the following experiments explain, the macroscopic behavior of gases using kinetic-molecular theory.

Experiment #1

P	V	n	T	constant n and T
initial	2.59	38	4	300
final	5.18	19	4	300

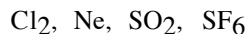
Observation:

Experiment #2

P	V	n	T	constant V and T
initial	2.59	38	4	300
final	1.29	38	2	300

Observation:

20. List the following gases in order of increasing rate of diffusion



21. Oxygen, O_2 , diffuses at a rate which is 2.23 times faster than a sample of a reddish-brown gas. Determine the molar mass of the unknown gas.

22. Calculate the volume of $\text{SO}_2(g)$ produced when 2.00 liters of O_2 react with excess sulfur at constant temperature and pressure.

23. A sample of oxygen collected over water at 29°C exerts a total pressure of 759 mmHg. If the volume of the container is 125 mL calculate the mass of oxygen present.

24. Describe the two factors responsible for the deviation of real gases from ideal behavior as assumed in the ideal gas equation.