

Gas Laws Worksheet

Charles's Law (temperature, volume)

1) A 550.0 mL sample of nitrogen gas is warmed from 77 °C to 86 °C. Find its new volume if the pressure remains constant.

564 ml

2) A gas occupies 1.00 L at 0.00°C. What is the volume at 333.0 °C?

2.22 L

Boyle's Law (pressure, volume)

3) Convert 338 L at 63.0 atm to its new volume at 1.00 atm.

21300 L or 2.13×10^4 L

4) A tank of nitrogen has a volume of 14.0 L and a pressure of 760.0 mm Hg. Find the volume of nitrogen when its pressure is changed to 400.0 torr while the temperature is held constant.

26.6 L

5) What pressure (mm Hg) is required to compress 196.0 liters of air at 1.00 atmosphere into a cylinder whose volume is 26.0 liters?

5730 mmHg

Gay-Lussac's Law (temperature, pressure)

6) A gas has a pressure of 0.0370 atm at 50.0 °C. What is the pressure at 0.00 °C?

.0313 atm

7) If a gas in a closed container, with an original temperature of 25.0 °C, is pressurized from 15.0 atmospheres to 16.0 atmospheres, what would the final temperature of the gas be?

318 K

Use the combined gas law to solve the following problems:

8) If I initially have a gas at a pressure of 12 atm, a volume of 23 liters, and a temperature of 200.0 K, and then I raise the pressure to 14 atm and increase the temperature to 300.0 K, what is the new volume of the gas?

30. L

9) 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?

31 L

Ideal Gas Law

10) Calculate the pressure, in atmospheres, exerted by each of the following:

a. 250 L of gas containing 1.35 moles at 320 K.

.14 atm

b. 4.75 L of gas containing 0.86 moles at 300. K.

4.5 atm

11) Calculate the volume, in liters, occupied by each of the following:

a. 2.00 moles of H_2 at 300. K and 1.25 atm.

39.4 L

b. 0.425 moles of ammonia gas (NH_3) at 0.724 atm and $37^\circ C$

14.9 L

12) Determine the number of moles contained in each of the following gas systems:

a. 1.25 L of O_2 at 1.06 atm and 250. K

.0646 moles

b. 0.80 L of ammonia gas (NH_3) at 0.925 atm and $27^\circ C$

.030 moles