

Chemistry
Unit #17—Gases

Gay-Lussac's Law

Pressure is in atmospheres
Temperature is in Kelvins

760 mm Hg = 1 atm

101.3 kPa = 1 atm

$$\text{___ } ^\circ\text{C} + 273.15 \text{ K} = \text{___ K}$$

1. A sample of nitrogen gas was placed into a rigid, metal container at a temperature of 20.0 °C and a pressure of 3.00 atm. The temperature was raised to 50.0 °C. What is the pressure of the nitrogen gas after its temperature is increased?

$$\begin{aligned} P_1 &= \\ T_1 &= \\ P_2 &= \\ T_2 &= \end{aligned}$$

2. A sample of gas at 315 kPa inside a steel tank is cooled from 500 °C to 0 °C. What is the final pressure of the gas in the steel tank?

$$\begin{aligned} P_1 &= \\ T_1 &= \\ P_2 &= \\ T_2 &= \end{aligned}$$

3. The temperature of a sample of gas in a steel container at 215 kPa was -100 °C. If the pressure was decreased to 190 kPa, what is the temperature of the gas in the container?

$$\begin{aligned} P_1 &= \\ T_1 &= \\ P_2 &= \\ T_2 &= \end{aligned}$$

4. Calculate the final pressure inside a scuba tank after it cools from 1000 °C to 25.0 °C. The initial pressure in the tank is 130.0 atm.

$$\begin{aligned} P_1 &= \\ T_1 &= \\ P_2 &= \\ T_2 &= \end{aligned}$$

5. A gas has a pressure of 0.370 atm at 50 °C. What is the final pressure at 25 °C?

$$\begin{aligned} P_1 &= \\ T_1 &= \\ P_2 &= \\ T_2 &= \end{aligned}$$

6. A gas is found to exert 97.0 kPa at 25.0°C. What would be the required temperature to change the pressure to 101.3 kPa?

$$\begin{aligned} P_1 &= \\ T_1 &= \\ P_2 &= \\ T_2 &= \end{aligned}$$

7. A gas is collected at 22.0 °C and 745.0 mmHg. When the temperature is changed to 25 °C, what is the new pressure?

$$\begin{aligned} P_1 &= \\ T_1 &= \\ P_2 &= \\ T_2 &= \end{aligned}$$