

Gas Laws Practice Benchmark

1. A given mass of oxygen occupies 500 ml when the pressure is 800 mm of Hg. What volume will the gas occupy at 200 mm Hg, provided the temperature remains constant?

$$(800 \text{ mmHg})(500 \text{ mL}) = (200 \text{ mmHg})(V_2)$$

2000 mL

2. Calculate the volume that will be occupied by 240 mL of hydrogen, measured at 360 mm Hg, when the pressure is changed to 1080 mm Hg.

$$(360 \text{ torr})(240 \text{ mL}) = (1080 \text{ torr})(V_2)$$

80 mL

3. A gas has a volume of 4 L at a temperature of -33 °C. If the temperature is increased to 27 °C and the pressure remains constant, what will be the new volume of the gas?

$$\frac{4 \text{ L}}{240 \text{ K}} = \frac{V_2}{300 \text{ K}}$$

5 L

4. A gas measures 140 ml at 400 K. Find its volume at 120 K if the pressure remains constant.

$$\frac{140 \text{ mL}}{400 \text{ K}} = \frac{V_2}{120 \text{ K}}$$

42 mL

5. To what temperature must a sample of gas at 100 K and 5 atm be heated in order to increase the pressure to 8 atm?

$$\frac{5 \text{ atm}}{100 \text{ K}} = \frac{8 \text{ atm}}{T_2}$$

160 K

6. A sample of hydrogen exerts a pressure of 1.50 atmospheres at a temperature of 160 K. What pressure does the gas exert at 640 K?

$$\frac{1.50 \text{ atm}}{160 \text{ K}} = \frac{P_2}{640 \text{ K}}$$

6 atm

7. A gas collected when the temperature is 7°C and the pressure is 140 kPa measures has a volume of 4 L. Calculate its volume at 60 kPa and 27°C.

$$\frac{(140 \text{ kPa})(4 \text{ L})}{280 \text{ K}} = \frac{(60 \text{ kPa})(V_2)}{300 \text{ K}}$$

10 L

8. A 300 mL sample of a gas at a temperature of 400 K exerts a pressure of exactly one atmosphere. What pressure does the gas exert when the volume decreases to 200 mL and the temperature increases to 600 K?

$$\frac{(1 \text{ atm})(300 \text{ mL})}{400 \text{ K}} = \frac{(P_2)(200 \text{ mL})}{600 \text{ K}}$$

2.25 atm