

**CHEMISTRY: IDEAL GAS LAW PROBLEMS**

Name: \_\_\_\_\_

$$P V = n R T$$

$$R = 0.0821 \text{ L-atm/mol-K}$$

1. Calculate the pressure exerted by 10. moles of carbon dioxide gas ( $\text{CO}_2$ ) in a tank of volume 400. Liters at a temperature of  $80^\circ\text{C}$ ? (0.724 atm).

$$g = \begin{array}{l} P = \\ V = \\ n = \\ R = \\ T = \end{array}$$

2. What volume does 0.0250 mole  $\text{H}_2$  occupy at 0.821 atm pressure and 300. K? (0.750L)

$$g = \begin{array}{l} P = \\ V = \\ n = \\ R = \\ T = \end{array}$$

3. Some oxygen, 250. mL, is measured at  $25^\circ\text{C}$  and 720. mm Hg pressure. How many moles is this? (0.00968 mol)

$$g = \begin{array}{l} P = \\ V = \\ n = \\ R = \\ T = \end{array}$$

4. Calculate the volume occupied by 15 grams of nitrogen gas at  $15.0^\circ\text{C}$  and 735 mm pressure. (13 Liters)

$$g = \begin{array}{l} P = \\ V = \\ n = \\ R = \\ T = \end{array}$$

5. what volume is occupied by 1.00 mole of nitrogen at  $27.0^\circ\text{C}$  and 900. mm Hg? (20.8 L)

$$g = \begin{array}{l} P = \\ V = \\ n = \\ R = \\ T = \end{array}$$

6. What volume is occupied by 40.0 grams of fluorine at  $25.0^\circ\text{C}$  and 900. mm Hg? (21.7 L)

$$g = \begin{array}{l} P = \\ V = \\ n = \\ R = \\ T = \end{array}$$

7. Calculate the volume of 80.0 grams of nitrogen at  $600^\circ\text{C}$  and 1000 atmospheres pressure. (0.204 L)

$$g = \begin{array}{l} P = \\ V = \\ n = \\ R = \\ T = \end{array}$$

8. Calculate the weight of 19.2 Liters of He at  $-20.0^\circ\text{C}$  and 800 mm. (3.90 g)

$$g = \begin{array}{l} P = \\ V = \\ n = \\ R = \\ T = \end{array}$$

9. A 15.0 mL flask contains only CO<sub>2</sub> at a temperature of 90.0 C and a pressure of 748 mm Hg. How many molecules are in the flask? (2.99 x 10<sup>20</sup>)

P =

V =

g =

n =

R =

T =

10. Calculate the weight of ethane, C<sub>2</sub>H<sub>6</sub>, required to produce a pressure of 1520 mm Ht at 20.0 C when contained in a 9.00 L vessel.

P =

V =

g =

n =

R =

T =

11. How many grams of hydrogen will be required to fill a spherical balloon 2.50 meters in diameter at 25.0 C and 740 mm Hg pressure? ( $V = \frac{4}{3} \pi r^3$ ) (1000 L = 1 m<sup>3</sup>) (657 g)

P =

V =

g =

n =

R =

T =

12. A deep underground cavern contains 2.24 x 10<sup>6</sup> L of methane gas (CH<sub>4</sub>) at a pressure of 15.0 atm and a temperature of 42.0 C. How many grams of methane does this natural gas deposit contain? (20.9 x 10<sup>7</sup> g)

P =

V =

g =

n =

R =

T =

13. What volume will 12.0 g of oxygen gas occupy at 25.0 C and a pressure of 0.250 atm? (17.6 L)

P =

V =

g =

n =

R =

T =

14. What pressure will be exerted by 0.450 mol of a gas at 25.0 C if it is contained in a vessel whose volume is 650. cm<sup>3</sup>? (16.9 atm)

P =

V =

g =

n =

R =

T =

15. If 4.50 grams of methane gas (CH<sub>4</sub>) is introduced into an evacuated 2.00 L container at 35.0 C, what is the pressure in the container, in atmospheres? (3.56 atm)

P =

V =

g =

n =

R =

T =

16. A 5.00 L flask, at 25.0 C, contains 0.200 mol of Cl<sub>2</sub>. What is the pressure in the flask? (0.979 atm)

P =

V =

g =

n =

R =

T =