

Mole Calculation Practice Worksheet

Answer the following questions:

- 1) How many moles are in 25.0 grams of water?
- 2) How many grams are in 4.500 moles of Li_2O ?
- 3) How many molecules are in 23.0 moles of oxygen?
- 4) How many moles are in 3.4×10^{23} molecules of H_2SO_4 ?
- 5) How many molecules are in 25.0 grams of NH_3 ?
- 6) How many grams are in 8.200×10^{22} molecules of N_2I_6 ?

Mole Calculation Practice Worksheet Solutions

Answer the following questions:

- 1) How many moles are in 25.0 grams of water?

1.39 moles

1 mole H₂O = 18.0 g H₂O

$$\frac{25 \text{ g H}_2\text{O}}{18.0 \text{ g H}_2\text{O}} \times \frac{1 \text{ mol H}_2\text{O}}{1 \text{ mol H}_2\text{O}} = 1.39 \text{ mol H}_2\text{O}$$

- 2) How many grams are in 4.500 moles of Li₂O?

134.6 grams

1 mole Li₂O = 29.90 g Li₂O

$$\frac{4.500 \text{ mol Li}_2\text{O}}{1 \text{ mol Li}_2\text{O}} \times \frac{29.90 \text{ g Li}_2\text{O}}{1 \text{ mol Li}_2\text{O}} = 134.6 \text{ g Li}_2\text{O}$$

- 3) How many molecules are in 23.0 moles of oxygen?

1.38 x 10²⁵ molecules

1 mole oxygen molecules = 6.02 x 10²³ oxygen molecules

$$\frac{23.0 \text{ mol O}_2}{1 \text{ mol O}_2} \times \frac{6.02 \times 10^{23} \text{ O}_2 \text{ molecules}}{1 \text{ mol O}_2} = 1.38 \times 10^{25} \text{ O}_2 \text{ molecules}$$

- 4) How many moles are in 3.4 x 10²³ molecules of H₂SO₄?

0.56 moles

1 mole anything = 6.02 x 10²³ anything

$$\frac{3.4 \times 10^{23} \text{ molecules H}_2\text{SO}_4}{6.02 \times 10^{23} \text{ molecules H}_2\text{SO}_4} \times \frac{1 \text{ mol H}_2\text{SO}_4}{1 \text{ mol H}_2\text{SO}_4} = 0.56 \text{ mol H}_2\text{SO}_4$$

5) How many molecules are in 25.0 grams of NH_3 ?

8.85×10^{23} molecules

1 mole $\text{NH}_3 = 17.0 \text{ g NH}_3$

1 mole anything = 6.02×10^{23} anything

$$\frac{25.0 \text{ g NH}_3 \left| \begin{array}{c} 1 \text{ mol NH}_3 \\ 17.0 \text{ g NH}_3 \end{array} \right| \begin{array}{c} 6.02 \times 10^{23} \text{ molecules NH}_3 \\ 1 \text{ mol NH}_3 \end{array}}{\hspace{10em}} = 8.85 \times 10^{23} \text{ molecules NH}_3$$

6) How many grams are in 8.200×10^{22} molecules of N_2I_6 ?

107.5 grams

1 mole $\text{N}_2\text{I}_6 = 789.4 \text{ g N}_2\text{I}_6$

1 mole anything = 6.02×10^{23} anything

$$\frac{8.200 \times 10^{22} \text{ molecules N}_2\text{I}_6 \left| \begin{array}{c} 1 \text{ mol N}_2\text{I}_6 \\ 6.02 \times 10^{23} \text{ molecules N}_2\text{I}_6 \end{array} \right| \begin{array}{c} 789.4 \text{ g N}_2\text{I}_6 \\ 1 \text{ mol N}_2\text{I}_6 \end{array}}{\hspace{10em}} = 107.5 \text{ g N}_2\text{I}_6$$