

# Molarity Worksheet

1. How many moles of LiF would be required to produce a 2.5 M solution with a volume of 1.5 L?
2. How many moles of  $\text{Sr}(\text{NO}_3)_2$  would be used to prepare 2.50 L of a 3.5 M solution?
3. What is the molarity of a 500-ml solution containing 249 g of KI?
4. How many grams of  $\text{CaCl}_2$  would be required to produce a 3.5 M solution with a volume of 2.0 L?
5. How many moles of ethyl alcohol,  $\text{C}_2\text{H}_5\text{OH}$ , are present in 65 mL of a 1.5 M solution?
6. How many liters of a 6.0 M solution of acetic acid  $\text{CH}_3\text{COOH}$  contain 0.0030 moles of acetic acid?
7. You want 85 g of KOH. What volume of a 3.0 M solution of KOH will provide it?
8. If you dissolve 0.70 moles of HCl in enough water to prepare 250 mL of solution, what is the molarity of the solution you have prepared?
9. If 117 g of a compound are dissolved in 500.0 mL of water to give a 4.0 M solution, what is the molar mass of this compound?
10. How many moles of zinc chloride are in 1.50 L of 4.15 M zinc chloride solution?

# Molarity Worksheet

## Answers

1. How many moles of LiF would be required to produce a 2.5 M solution with a volume of 1.5 L?

$$\text{Moles of LiF} = 2.5 \text{ M} \times 1.5 \text{ L} = 3.75 \text{ M}$$

2. How many moles of  $\text{Sr}(\text{NO}_3)_2$  would be used to prepare 2.50 L of a 3.5 M solution?

$$\text{Moles of Sr}(\text{NO}_3)_2 = 3.5 \text{ M} \times 2.5 \text{ L} = 8.75 \text{ M}$$

3. What is the molarity of a 500-ml solution containing 249 g of KI?

$$\text{Molarity} = (249 \text{ g} \times 1 \text{ mol}/166 \text{ g})/0.500 \text{ L} = 3 \text{ M}$$

4. How many grams of  $\text{CaCl}_2$  would be required to produce a 3.5 M solution with a volume of 2.0 L?

$$\text{Mass} = 3.5 \text{ M} \times 2.0 \text{ L} \times 111 \text{ g/mol} = 777 \text{ g}$$

5. How many moles of ethyl alcohol,  $\text{C}_2\text{H}_5\text{OH}$ , are present in 65 mL of a 1.5 M solution?

$$\text{Moles of C}_2\text{H}_5\text{OH} = 1.5 \text{ M} \times 0.065 \text{ L} = 0.098 \text{ moles}$$

6. How many liters of a 6.0 M solution of acetic acid  $\text{CH}_3\text{COOH}$  contain 0.0030 moles of acetic acid?

$$\text{Volume} = 0.0030 \text{ moles}/6.0 \text{ M} = 5.0 \times 10^{-4} \text{ L}$$

7. You want 85 g of KOH. What volume of a 3.0 M solution of KOH will provide it?

$$\text{Volume} = (85 \text{ g} \times 1 \text{ mol}/56 \text{ g})/3.0 \text{ M} = 0.51 \text{ L}$$

8. If you dissolve 0.70 moles of HCl in enough water to prepare 250 mL of solution, what is the molarity of the solution you have prepared?

$$\text{Molarity} = 0.70 \text{ moles}/0.250 \text{ L} = 2.8 \text{ M}$$

9. If 117 g of a compound are dissolved in 500.0 mL of water to give a 4.0 M solution, what is the molar mass of this compound?

$$\text{Molar mass} = 4.0 \text{ M} \times 0.500 \text{ L} \times 117 \text{ g}/2.0 \text{ mol} = 58.5 \text{ g/mol}$$

10. How many moles of zinc chloride are in 1.50 L of 4.15 M zinc chloride solution?

$$\text{Moles of zinc chloride} = 4.15 \text{ M} \times 1.5 \text{ L} = 6.225 \text{ mol}$$