What is Molarity (Concentration)?

Worksheet

Molarity is calculated as M = n/V, where n is the moles of solute and V is the volume of solution in liters; its unit is mol/L, also written as M.

$$M = \frac{n}{V}$$

Questions

1. What is the molarity of a solution with 3 mol of solute in 6 L?

A) 0.5 mol/L
B) 2 mol/L
C) 18 mol/L
D) 6 mol/L

2. A solution's molarity increases when

A) More solvent is added
B) The volume increases at constant moles
C) More solute is dissolved in the same volume
D) The temperature drops

3. How many moles are in 2 L of a 3 M solution?

A) 1.5 mol
B) 6 mol
C) 0.67 mol
D) 5 mol

4. What happens to molarity when you dilute a solution with water?

A) It increases
B) It decreases
C) It stays the same
D) It becomes negative

5. 0.5 mol of NaCl is dissolved to make 2 L of solution. Find the molarity.

6. How many moles of solute are needed to make 3 L of a 1.5 M solution?

7. 2 mol of HCl is dissolved in enough water to give a concentration of 4 M. Find the volume of solution.

8. Define: What is the molarity formula?

9. Define: What is the unit of molarity?

10. Define: If you add more water to a solution, what happens to molarity?

Answer Key

1. A) 0.5 mol/L - M = n/V = 3/6 = 0.5 mol/L.

2. C) More solute is dissolved in the same volume - Adding more solute to the same volume raises n/V, increasing molarity.

3. B) 6 mol - n = M V = 3 2 = 6 mol.

4. B) It decreases - Dilution increases volume without adding solute, so M = n/V decreases.

5. M = n/V M = 0.5/2 M = 0.25 mol/L

6. M = n/V n = M V n = 1.5 3 n = 4.5 mol

7. M = n/V V = n/M V = 2/4 V = 0.5 L

8. M = n/V, where n is moles of solute and V is volume of solution in liters.

9. mol/L, also written as M.

10. Molarity decreases - the same moles are spread over a larger volume (dilution).