How Do You Calculate Concentration?

Worksheet

Concentration is calculated by dividing the amount of solute by the amount of solvent or solution. Common formulas: M = n/V (molarity), PPM = mg/L, %w/w = (g solute / g solution)100, %v/v = (mL solute / mL solution)100.

Concentration = (amount of solute) / (amount of solution)

Questions

1. 10 g salt in 100 g solution - what is %w/w?

A) 1%
B) 5%
C) 10%
D) 50%

2. What unit is best for measuring pollutants in water?

A) Molarity
B) PPM (mg/L)
C) %w/w
D) Molality

3. 50 mL water + 50 mL alcohol = 100 mL. What is %v/v alcohol?

A) 25%
B) 33%
C) 50%
D) 75%

4. Which formula uses mass of solute and mass of solution?

A) %v/v
B) PPM
C) %w/w
D) Molarity

5. What is the weight percent of 15 g NaCl dissolved in 150 g of solution?

6. A solution contains 250 mg of sugar in 1 L. What is the PPM?

7. Volume percent of 20 mL ethanol in 200 mL total solution?

8. Define: What is weight percent (%w/w)?

9. Define: What is volume percent (%v/v)?

10. Define: What does PPM stand for?

Answer Key

1. C) 10% - (10 g / 100 g) 100 = 10%
2. B) PPM (mg/L) - PPM detects very low concentrations typical of contaminants.
3. C) 50% - (50 mL / 100 mL) 100 = 50%
4. C) %w/w - %w/w = (g solute / g solution) 100 uses mass.
5. %w/w = (mass solute / mass solution) 100 %w/w = (15 / 150) 100 %w/w = 10%
6. PPM = mass (mg) / volume (L) PPM = 250 mg / 1 L PPM = 250 mg/L
7. %v/v = (volume solute / volume solution) 100 %v/v = (20 / 200) 100 %v/v = 10%
8. (mass of solute / mass of solution) 100 - expresses concentration as a percentage by mass.
9. (volume of solute / volume of solution) 100 - concentration as a percentage by volume.
10. Parts per million (mg/L) - used for very dilute solutions, especially in environmental science.