

Worksheet 2

Topic: Concentration and Molarity

Q.1 What is the concentration, in gL^{-1} , of a solution containing 8.00g of sodium chloride in 500mL of solution?

Q. 2 A sample of tap water was found to contain 0.0537g of sodium chloride (NaCl) per 250.0g of solution. Calculate the concentration of NaCl in parts per million (ppm).

Q. 3 What is the concentration, in gL^{-1} , of a 60mL solution that contains 5.0g of sugar?

A 300

B 0.83

C 12

D 83

Q. 4

a. A 750mL bottle of whisky contains 244mL of ethanol. What is the concentration of ethanol in $\%(\text{v/v})$?

b The concentration of ethanol in a 350mL bottle of beer is $4.9\%(\text{v/v})$. Calculate the volume of ethanol in the bottle.

Q.5 Calculate the molar concentration of a solution that contains 0.24mol of glucose dissolved in 500mL of solution.

Q.6 Calculate the amount, in mol, of potassium permanganate (KMnO_4), in 100mL of a 0.0250molL^{-1} solution of the compound.

Q.7 Calculate the molar concentration of the following solutions:

a. a 25.0mL solution that contains 2.0×10^{-3} mol of NaCl

- b. a 4.1L solution that contains 1.23mol of CH₃COOH
- c. a 9.3×10^3 L solution that contains 1.8×10^3 mol of KCl

Q.8 A 750mL bottle of vinegar contains 0.98mol of ethanoic acid. Calculate the molar concentration of ethanoic acid.

Q.9 Calculate the molar concentration of a 250mL solution that contains 5.09g of AgNO₃.

Q.10 What is the molar concentration of a sodium carbonate solution prepared by dissolving 1.32g of sodium carbonate in a volumetric flask that is made up to 250.0mL?

Q.11 Calculate the concentration of the solution formed when 95.0mL of water is added to 5.00mL of 0.500molL⁻¹ sulfuric acid (H₂SO₄).

Q.12 What is the concentration, in ppm, of a 0.00200molL⁻¹ solution of NaCl? Remember that concentration in ppm is the same as mgL⁻¹.

Q.13 What volume of 10molL⁻¹ hydrochloric acid would be required to prepare 250mL of a 0.30molL⁻¹ HCl solution?

A 7.5L

B 133L

C 0.133L

D 0.0075L

Q.14 Calculate the mass of anhydrous sodium carbonate (Na₂CO₃) required to prepare 250.0mL of a 0.500mol L⁻¹ standard solution.

Q.15 What volume of water must be added to 25mL of a 4.0molL⁻¹ solution of potassium carbonate solution to dilute it to a concentration of 1.6molL⁻¹?