What is Dilution and Titration?

Worksheet

Dilution uses the formula MV = MV: initial molarity initial volume = final molarity final volume. Titration is an analytical method where a reagent of known concentration is added until a reaction endpoint is reached.

MV = MV

Questions

1. 20 mL of 5 M solution diluted to 100 mL. New molarity?

A) 0.5 M
B) 1 M
C) 2 M
D) 5 M

2. What does MV = MV describe?

A) Titration endpoint
B) Dilution relationship
C) Reaction rate
D) Equilibrium

3. To dilute a solution, you should

A) Heat it
B) Add more solute
C) Add solvent
D) Freeze it

4. In titration, the indicator shows

A) When to start
B) The equivalence point
C) The pH
D) The temperature

5. If 50 mL of 4 M HCl is diluted to 200 mL, what is the new molarity?

6. To make 500 mL of 0.5 M solution from 2 M stock, how much stock is needed?

7. In a titration, 25 mL of 0.1 M NaOH neutralized 20 mL of HCl. Find HCl molarity.

8. Define: What is dilution?

9. Define: State the dilution formula.

10. Define: What is titration?

Answer Key

1. B) 1 M - MV = MV 520 = M100 M = 1 M
2. B) Dilution relationship - This is the dilution formula, showing conservation of moles during dilution.
3. C) Add solvent - Dilution means adding solvent to decrease concentration.
4. B) The equivalence point - The indicator color change marks the endpoint, close to the equivalence point.
5. MV = MV 4 mol/L 50 mL = M 200 mL 200 = 200M M = 1 mol/L
6. MV = MV 2 mol/L V = 0.5 mol/L 500 mL V = 125 mL of stock solution
7. For 1:1 ratio: M_acid V_acid = M_base V_base M_HCl 20 mL = 0.1 mol/L 25 mL M_HCl = 0.125 mol/L
8. The process of decreasing concentration by adding more solvent while keeping the amount of solute constant.
9. MV = MV - molarity and volume are inversely proportional during dilution.
10. An analytical technique where a reagent of known concentration is added to an unknown sample until the reaction endpoint (indicator change) is reached.