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Neutralization Titrations Questions and Problems

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Q1. Why are the standard reagents used in neutralization titrations generally strong acids and strong bases rather than weak acids and weak bases ?

Q2. Which solute would provide the sharper end point in a titration with 0.10N HCl:

a- 0.10 N of NaOH .

b- 0.10 N of Na_2CO_3 .

c- 0.10 N of NaHCO_3 .

Q3. Which solute would provide the sharper E.p. in a titration with 0.10 N NaOH :

a- 0.10 N HCl .

b- 0.10 N CH₃COOH .

c- 0.10 N H₂CO₃ .

Q4. What is the mass of :

a- 0.32 mol of HCl ?

b- 0.2 mol of NaOH ?

c- 0.6 mol of Na₂CO₃ ?

d- 1.0 mol of CH₃COOH ?

Q5. What is the mass of:

a- 0.32 equivalents of HCl ?

b- 0.2 equivalents of NaOH ?

c- 0.6 equivalents of Na_2CO_3 ?

d- 1.0 equivalents of CH_3COOH ?

Q6. What is the mass of solute in:

a- 250 ml of 0.23 M of Na_2CO_3 ?

b- 250 ml of 0.23 N of Na_2CO_3 ?

c- 250 ml of 0.23 M of NaOH ?

d- 250 ml of 0.23 N of NaOH ?

- Q7.** Calculate the molar concentration of Na_2CO_3 in aqueous solution containing 4 g of Na_2CO_3 (106g/mol) in 1.0 L of solution.
- Q8.** Describe the preparation of 100ml of 6.0 N HCl from a concentrated solution that has a specific gravity of 1.19 and is 37.2 % (w/w) HCl (36.5 g/mol) .
- Q9.** What is the normality of an aqueous solution that is 3.00% HCl by mass and has a density of 1.015 g/ml ?

Q10. Calculate the normality of a solution that contains 2.00% (w/w) NaOH and a density of 1.022 g/ml .

Q11. Calculate the normality of a solution prepared by :

a- Dissolving 36.5 g of NaOH in water and diluted to 500 ml .

b- Diluting 25 ml of the solution in (a) to 250 ml.

c- Diluting 10ml of the solution in (b) to 1L.

Q12. Suppose three possible causes that can account for titration errors .

Q13: Calculate the normality of HCl sln. If 30 ml were needed to titrate a 0.2 g sample of primary standard Na_2CO_3 ?

Q14: A solution contains 3.0 g of NaOH in each 15 ml ,

a- What is the normality of the solution ?

b- How many milliliters of 3.10 N acetic acid will be equivalent to 25.0 ml of the above NaOH solution ?

- Q15:** A bottle of glacial acetic acid has the following information on its label, purity of 99.5% & specific gravity 1.05
- a- Calculate the normality of this solution.
 - b- How could you prepare 500 ml of 0.1N of HAc sln. from the concentrated reagent?

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Best
Wishes