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CHEMISTRY - XII

Volumetric Analysis

1. Define the following terms i) Titration ii) Acidimetry iii) Alkalimetry iv) Indicators.
2. Give the formula for the following:
   (a) Equivalent mass of an element (b) Equivalent mass of an acid
   (c) Equivalent mass of salt (d) Equivalent mass of base
   (e) Equivalent mass of oxidizing agent (f) Equivalent mass of radical
   (g) Equivalent mass of reducing agent.
3. Define the following terms
   a. gram/liter b. normality
   c. Decinormal solution d. Molarity
   e. Molality f. normality factor
4. What are the primary and secondary standard substance? What are the requisites for a substance to become a primary standard solution
6. What is pH titration curve? Sketch pH curve for following with pH range and suitable indicator.
   (a) strong acid strong base (b) strong acid weak base
   (c) weak acid weak base (d) weak acid strong base.
   Strong acid and base: Strong acid and strong base
   Weak acid and weak base Weak acid strong base
7. Define indicators? How is a suitable indicator selected for a particular titration?
8. How much NaCl is produced when 100mL of N/10 HCl is mixed with 200mL of N/10 NaOH solution?
9. 25.0 cc of an alkali solution is mixed with 8.0 cc of 0.75 N acid solution and for complete neutralization. It further required 15.0 cc of .80 N acid solution. Find the concentration of given alkali solution.
10. 2.95 g of dibasic acid was dissolved in water and the solution was diluted to 250 cc. 25 cc of the solution required 25 cc of N/5 $Na2CO_3$ solution to be neutralized. Calculate the equivalent weight and molecular weight of acid.
11. Define the term basicity of acid, acidity of base, standard solution, unknown solution, centinormal solution, molar solution and binormal solution.
13. Define Lewis acid and Lewis base with and example of each. What are Bronsted and Lowry acid and bases. What are the advantages and limitations of Bronsted and Lowry concept? Give conjugate acid and base of ammonia.
14. What is a redox reaction? Why is it called so? Give an example of it.
15. State the relation between normality and molarity?

Haloalkanes

Very short questions

1. What are haloalkanes? How are they classified?
2. Write the possible isomers of molecular formula C_4H_9Br and give their IUPAC name.
3. How do you prepare ethyl iodide from alcohol?
4. Why is chloroform stored in a dark brown bottle?
5. Why chloroform does not give white precipitate with aq. Silver nitrate?
6. Why chlorobenzene does give orthao/ para product during electrophilic substitution reaction?
7. Define iodoform test.what type of molecule give positive iodoform test?
8. Write three methods of preparation of chlorobenzene. How does it react with i) methylchoride in the presence of dry ether ii) magnesium in THF.
9. Account for the fact that C – X bond in halo benzene is stronger than that of haloalkane. Nucleophilic substitution reaction in chlorobenzene is difficult as compared to chloroethane. Why?
10. What happens when chlorobenzene is
    i) heated with chloral in acidic medium.
11. Chlorobenzene undergoes electrophylic substitution in ortho and para position. Why?
12. Iodoethane when reacted with alcoholic silver cyanide gives compound A which when treated with lithium aluminum hydride gives compound B. Write the name and structure of compound A and B. Name the type of reaction taking place in the making of A and B respectively.
13. Write down the structure of secondary haloalkane of molecular formulae C3H7X . What happens when this compound is heated with sodium in dry ether?

Short Questions

1. How do you prepare chloroethane from ethane, ethanol and ethene respectively? What happens when chlorethane is heated with i) sodium in

the presence of ether ii) alc KOH

From ethane:

From ethanol:

From ethene:

2. Describe the lab preparation of chloroform from ethanol or acetone with well labeled diagram.
3. What is Grignard reagent? How is it prepared? How does CH_3CH_2BrMg reacts with

   (i) H_2O (ii) H – CHO (iii) CO_2
5. What happens when,
   (i) Chloroform is heated with silver power
   (ii) Chloroform is heated with aniline in the presence of alc. NaOH
   (iii) Chlorobenzene is treated with chloral.
   (iv) Chloroform boiled with aq. KOH solution
   (v) Ethyl iodide reacts with sodium ethoxide
6. Give one chemical reaction of following name reactions:
   (a) Williamson's ether synthesis
   (b) Sandmeyer's reaction
   (c) Gattermann's reaction
   (d) Wurtz-Fitting reaction
   (e) Wurtz reaction
7. Conversion
   (i) 1 - bromopropane to 2 - bromoproane
   (ii) iodomethane to ethane
   (iii) iodomethane to ethene
   (iv) bromoethane to ethyene
8. Write short notes

   (i) Markonikov's rule (ii) Peroxide effect
9. Write uses of chloroform.
10. Chloroethane when heated with alcoholic potassium hydroxide produce compound A. Compound A on treatment with ozone followed by hydrolysis gives compound B. With clearly shown chemical reaction identify compound A and B.

Aromatic Hydrocarbons (Benzene)

Very Short Questions

1. Define aromatic hydrocarbons or arenes. With suitable example
2. Write two general methods of preparation of benzene.
3. Why is benzene called aromatic compound?
4. State Huckel's rule for aromaticity.
5. Define Friedel craft alkylation with example.
6. What happens when benzene is treated with
   i) chlorine in the presence of sunlight
   ii) nitrating mixture at 60 degrees
   iii) heated with acetic anhydride in the presence of anhydrous AlCl3
7. What happens when sodium benzoate is heated with soda lime?

Short Questions

8. Write five characteristic features of aromatic compounds.
9. How would you convert (a) acetylene to benzene (b) phenol to benzene

Kinetics

Short questions

1. Define Rate of Reaction. Differentiate averages instantaneous Rate of Reaction.
2. What B Rate law? Difference between order and molecularity.
3. State and explain collision theory.