CHEMISTRY

BOOKS - G.R. BATHLA & SONS CHEMISTRY (HINGLISH)

VOLUMETRIC ANALYSIS

Example 1

1. When hydrogen gas was passed over 8.08 g of heated metal oxide, it was completely reduced and 1.8 g of water was formed :

(a) What is weight of oxygen in the metal oxide ?

(b) What is the equivalent mass of the metal ?

Watch Video Solution

Example 2

1. SO_2 is oxidised to SO_4^{2-} in acid medium. Calculate equivalent mass of SO_2.

Watch Video Solution

Example 3

1. What is the equivalent mass of :

(a) H_3PO_4 when neutralised to HPO_4^{2-}

(b) $HClO_4$

(c) $NaIO_3$ when reduced to I^-

(d) $NaIO_3$ when reduced to I_2

(e) $Al(OH)_3$.

Watch Video Solution

2. 25 ml of $\frac{N}{10}$ caustic soda solution exactly neuralised 20ml of an acid solution contaning $7.875gm$ of acid per litre. What will be the equivalent mass of acid?

Watch Video Solution

3. 5.5 g of a mixutre of $FeSO_{4.7}H_2O$ and $Fe_2(SO_4)_{3.9}H_2O$ requires 5.4 " mL of " $0.1NKMnO_4$ solution for complete oxidation. Calculate the number of gram moles of hydrated ferric sulphate in the mixture.

Watch Video Solution

Example 4

1. Calculate the number of millimoles and milliequivalents of $Cr_2O_7^{2-}$ ions in acid medium when 100 mL of $0.01MCr_2O_7^{2-}$ is reduced to Cr^{3+} by Fe^{2+}.

Watch Video Solution

2. 150 mL of $N/10$ HCl is required to react completely with 1.0 g of a sample of limestone. Calculate the percentage purity of calcium carbonate.

Watch Video Solution

3. $0.5g$ mixture of $K_2Cr_2O_7$ and $KMnO_4$ was treated with excess of KI in acidic medium. Iodine liberated required $100cm^3$ of $0.15N$ sodium thiosulphate solution for titration. Find the per cent amount of each in the mixture.

Watch Video Solution

Example 5

1. What volumes of 12 N HCl and 3 N HCl must be mixed to form one litre 6 N HCl ?

Watch Video Solution

2. $0.63g$ of diabasic acid was dissolved in water. The volume of the solution was made $100mL$. $20mL$ of this acid solution required $10mL$ of $N/5NaOH$ solution. The molecular mass of acid is:

Watch Video Solution

3. Calculate the percentage of available chlorine in a given sample of bleaching powder from the following data :

3.55 g of bleaching powder when treated with acetic acid and excess of KI liberated iodine which required 60 mL of 0.5 N sodium thiosulphate solution.

Watch Video Solution

Example 6

1. (a) What is the normality of a 96 per cent solution of H_2SO_4 of specific gravity 1.84 ?

(b) How many mL of 96 per cent sulphuric acid solution is necessary to prepare one litre 0.1 N H_2SO_4 ?

(c) To what volume should 10 mL of 96 per cent H_2SO_4 be diluted to prepure 2 N solution ?

View Text Solution

2. 10.875 g of a mixture of NaCl and Na_2CO_3 was dissolved in water and the volume made up to 250 mL, 20 mL of this solution required 75.5 mL of $\frac{N}{10}H_2SO_4$. Find out the percentage composition of the mixture.

Watch Video Solution

3. 0.261 g of a sample of pyrolusite was heated with excess of HCl and the chlorine evolved was passed in a solution of KI. The liberated iodine required 90 mL $\frac{N}{30} Na_2S_2O_3$. Calculate the percentage of MnO_2 in the sample.

Watch Video Solution

Example 7

1. 250 mL of x M solution and 500 mL of y M solution of a solute A are mixed and diluted to 2 litre to produce a final concentration of 1.6 M.

Watch Video Solution

2. A quantity of ammonium chloride was heated with 100 mL of 0.8 N NaOH solution till the reaction was complete. The excess of NaOH was

neutralised with 12.5 mL of $0.75 NH_2SO_4$. Calculate the quantity of ammonium chloride.

Watch Video Solution

3. (i) What is the mass of sodium bromate and molarity of the solution necessary to prepare 85.4 mL of 0.672 N solution when the half reaction is ,

$$BrO_3^- + 6H^+ + 6e^- \rightarrow Br^- + 3H_2O$$

(ii) What would be the mass as well as molartiy if the half cell reaction is,

$$2BrO_3^- + 12H^+ + 10e^- \rightarrow Br_2 + 6H_2O$$

View Text Solution

Example 8

1. 2.68×10^{-3} moles of solution containing anion A^{n+} require 1.61×10^{-3} moles of MnO_4^- for oxidation of A^{n+} to AO_3^- in acidic medium. What is the value of n?

Watch Video Solution

2. A solution containing 4.2 g of KOH and $Ca(OH)_2$ is neutralised by an acid. If it consumes 0.1 g equivalents of the acid, calculate the composition of the sample.

Watch Video Solution

3. 50 mL of an aqueous solution of H_2O_2 was treated with an excess of KI solution and dilute H_2SO_4. The liberated iodine required 20 mL 0.1 N $Na_2S_2O_3$ solution for complete interaction. Calculate the concentration of H_2O_2 in g/L.

Watch Video Solution

Example 1

1. What is the strength in g per litre of a solution of H_2SO_4, $12mL$ of which neutralized $15mL$ of $N/10NaOH$ solution?

Watch Video Solution

2. 0.5 g of an oxalate was dissolved in water and the solution made to 100 mL. On titration 10 mL of this solution required 15 mL of $\frac{N}{20}KMnO_4$. Calculate the percentage of oxalate in the sample .

Watch Video Solution

Example 2

1. 4.9 g of H_2SO_4 is present in 100 mL of the solution. What is the molarity of the solution ? Calculate its normality also.

Watch Video Solution

2. How many mL of a 0.05 M $KMnO_4$ solution are required to oxidise 2.0 g of $FeSO_4$ in a dilute solution (acidic) ?

Watch Video Solution

Example 9

1. 1.03 g mixture of sodium carbonate and calcium carbone require 20 mL N HCl for complete neutralisation. Calculate the percentage of sodium carbonate and calcium carbonate in the given mixture.

View Text Solution

2. 0.124 g of iron wire was dissolved in dilute H_2SO_4 in oxygen free atmosphere and the resultant solution was titrated against 0.09672 N solution of $KMnO_4$. The titre value was 22.90 mL. Calculate the percentage purity of iron wire.

Watch Video Solution

Example 10

1. 1.325 g of anhydrous sodium carbonate are dissolved in water and the solution made up to 250 mL. On titration 25 mL of this solution neutralise 20 mL of a solution of suphuric acid. How much water should be added to 450 mL of this acid solution to make it exactly $N/12$?

View Text Solution

2. A sample of hydrazine sulphate $(N_2H_6SO_4)$ was dissolved in $100mL$ water. $10mL$ of this solution was reacted with excess of $FeCl_3$ solution and warmed to complete the reaction. Ferrous ions formed were estimated and it required $20mL$ of $M/50 KMnO_4$ solutions. Estimate the amount of hudrazine sulphate in one litre of solution.

Given $4Fe^{3+} + N_2H_4 \rightarrow N_2 + 4Fe^{2+} + 4H^+$

$MnO_4^- + 5Fe^{2+} + 8H^+ \rightarrow Mn^{2+} + 5Fe^{3+} + 4H_2O$

Watch Video Solution

Example 11

1. A sample of sodium carbonate contains sodium also. 1.5 g of the sample is dissolved in water and volume raised to 250 mL. 25 mL of this solution requires 20 mL of $\frac{N}{10}H_2SO_4$ solution for neutralisation. Calculate the percentage of sodium carbonate in the sample.

Watch Video Solution

2. $0.1MKMnO_4$ is used for the following titration. What volume of the solution in mL will be required to react with 0.158 g of $Na_2S_2O_3$?

$$\underset{(\text{not balanced})}{S_2O_3^{2-}} + MnO_4^- + H_2O \rightarrow MnO_2(s) + SO_4^{2-} + OH^-$$

Watch Video Solution

Example 12

1. In a sample of sodium carbonate some sodium sulphate is also mixed. 1.25 g of this sample is dissolved and the volume made up to 250 mL. 25 mL of this solution neutralises 20 mL of $\frac{N}{10}$ sulphuric acid. Calculate the percentage of sodium carbonate in the sample.

Watch Video Solution

2. $0.804g$ sample of iron ore was dissolved in acid. Iron was oxidised to $+2$ state and it requires $47.2mL$ of $0.112NKMnO_4$ solution for titration, Calculate $\%$ of Fe and Fe_3O_4 in ore.

Watch Video Solution

Example 13

1. 1.725 g of a metal carbonate is mixed with 300 mL of $\frac{N}{10}HCl$. $10mL$ of $\frac{N}{2}$ sodium hydroxide were required to neutralise excess of the acid. Calculate the equivalent mass of the metal carbonate.

View Text Solution

2. An equal volume of reducing agent is titrated separately with $1MKMnO_4$ in acid, neutral and alkaline medium. The volumes of

$KMnO_4$ required are $20mL$, $33.3mL$ and $100mL$ in acid, neutral and alkaline medium respectively. Find out oxidation state of Mn in each reaction product. Give balance equation. Find the volume of $1MK_2Cr_2O_7$ consumed if same volume of reductant is titrated in acid medium.

Watch Video Solution

Example 14

1. 1.575 g of oxalic acid $(COOH)_2.xH_2O$ are dissolved in water and the volume made up to 250 mL. On titration 16.68 mL of this soltuion requires 25 mL of $\frac{N}{15}NaOH$ solution for complete neutralisation. Calculate x.

Watch Video Solution

2. 1.6 g of pyrolusite ore was treted with 50 " mL of " 1.0 N oxalic acid and some sulphuric acid. The oxalic acid left undecomposed was raised to 250 mL in a flask. 25 " mL of " this solution, when titrated with 0.1 N $KMnO_4$ required 32 " mL of " this solution. Find out the percentage of pure MnO_2 and also the percentage of available oxygen from MnO_2.

Watch Video Solution

Example 15

1. 25 mL of a mixture of NaOH and Na_2CO_3 when itrated with $N/10$ HCl using phenolphthalein indicator required 25 mL HCl. The same volume of mixture when titrated with $N/10HCl$ using methyl orange indicator required 30 mL of HCl. Calculate the amount of Na_2CO_3 and NaOH in one litre of this mixture.

View Text Solution

2. A mixture of $H_2C_2O_4$ and $NaHC_2O_4$ weighing $2.02g$ was dissolved in water and the solution made uptp one litre. $10mL$ of this solution required $3.0mL$ of $0.1NNaOH$ solution for complete neutralization. In another experiment $10mL$ of same solution in hot dilute H_2SO_4 medium required $4mL$ of $0.1NKMnO_4KMnO_4$ for compltete neutralization. Calculate the amount of $H_2C_2O_4$ and $NaHC_2O_4$ in mixture.

Watch Video Solution

Example 16

1. 25 mL of a mixture of $NaOH + Na_2CO_3$, when titrated with $\frac{N}{10}HCl$ using phenolphthalein indicator required 25 mL HCl to deccolourise phenolphthalein. At this stage methyl orange was added and addition of acid was continued. The second end point was reached after further addition of 5 mL of the acid. Calculate the amount of Na_2CO_3 and NaOH in one litre of the solution.

View Text Solution

2. A $3.0g$ sample containing Fe_3O_4, Fe_2O_3 and an inert impure substance is treated with excess of KI solution in presence of dilute H_2SO_4. The entire iron is converted to Fe^{2+} along with the liberation of iodine. The resulting solution is diluted to $100mL$. A $20mL$ of dilute solution requires $11.0mL$ of $0.5MNa_2S_2O_3$ solution to reduce the iodine present. A $50mL$ of the diluted solution, after complete extraction of iodine requires $12.80mL$ of $0.25MKMnO_4$ solution in dilute H_2SO_4 medium for the oxidation of Fe^{2+}. Calculate the percentage of Fe_2O_3 and Fe_3O_4 in the original sample.

Watch Video Solution

Example 17

1. A solution contains Na_2CO_3 and $NaHCO_3$. 10 mL of the solution required 2.5 mL of 0.1 MH_2SO_4 for neutralisation using phenolphthalein as indicator. Methyl orange is then added when a further 2.5 mL of $0.2MH_2SO_4$ was required. Calculate the amount of Na_2CO_3 and$NaHCO_3$ in one litre of the solution.

View Text Solution

2. Hydroxylamine reduces Fe^{3+} accoeding to the following reaction:

$$2NH_2OH + 4Fe^{3+} \rightarrow H_2O + 4Fe^{2+} + 4H^{\oplus} + N_2O$$

Fe^{2+} produced is is estimated by titration with $KMnO_4$ solution A 10 mL sample of NH_2OH is diluted to 1000 mL. 50 " mL of " this diluted sample is boiled with excess of Fe (III) solution. The resulting solution required 12 " mL of " 0.02 M $KMnO_4$ for complete oxidation. Determine the strength of NH_2OH.

Watch Video Solution

Example 18

1. 0.5 g of fuming sulphuric acid $(H_2SO_4 + SO_3)$, called oleum, is diluted with water. Thus solution completely neutralised 26.7 " mL of " 0.4 M $NaOH$. Find the percentage of free SO_3 in the sample solution.

Watch Video Solution

2. $0.56g$ of lime stone was treated with oxalic acid to give CaC_2O_4. The precipitate decolorized $45ml$ of $0.2NKMnO_4$ in acid medium. Calculate $\%$ of CaO in lime stone.

Watch Video Solution

Example 19

1. 0.7875 g of crystalline barium hydroxide is dissolved in water .For the neutralization of this solution 20 mL of N/4 HNO_3 is required. How many moles of water of crystallization are present in one mole of this base ? (Given : Atomic mass Ba=137,O=16, N=14, H=1)

Watch Video Solution

2. A solution of $0.2g$ of a compound containing Cu^{2+} and $C_2O_4^{2-}$ ions on titration with $0.02MKMnO_4$ in presence of H_2SO_4 consumes $22.6mL$ oxidant. The resulting solution is neutralized by Na_2CO_3, acidified with dilute CH_3COOH and titrated with excess of KI. The liberated I_2 required $11.3mLof0.05MNa_2S_2O_3$ for complete reduction. Find out mole ratio of Cu^{2+} and $C_2O_4^{2+}$ in compound.

Watch Video Solution

Example 20

1. A piece of Al wieghing $2.7g$ is titrated with $75.0mL$ of H_2SO_4 (specific gravity $1.8mL^{-1}$ and 24.7% H_2SO_4 by weight). After the metal is completely dissolved, the solution is diluted to $400mL$. Calculate the molarity of free H_2SO_4 solution.

Watch Video Solution

2. $12.\ g$ of an impure sample of arsenious oxide was dissolved in water containing $7.5g$ of sodium bicarbonate and the resulting solution was diluted to $250mL$. $25mL$ of this solution was completely oxidised by $22.4mL$ of a solution of iodine. $25mL$ of this iodine solution reacted with same volume of a solution containing $24.8g$ of sodium thiosulphate $(Na_2S_2O_3.5H_2O)$ in one litre. Calculate teh percentage of arsenious oxide in the sample (Atomic mass of $As = 74$)

Watch Video Solution

Example 21

1. $0.50g$ of a mixture of K_2CO_3 and Li_2CO_3 required $30mL$ of $0.25NHCl$ solution for neutralization. What is $\%$ composition of mixure?

Watch Video Solution

2. Hydrogen peroxide solution $(20mL)$ reacts quantitatively with a solution of $KMnO_4(20mL)$ acidified with dilute of H_2SO_4. The same volume of the $KMnO_4$ solution is just decolourised by $10mL$ of $MnSO_4$ in neutral medium simultaneously forming a dark brown precipitate of hydrated MnO_2. The brown precipitate is dissolved in $10mL$ of $0.2M$ sodium oxalate under boiling condition in the presence of dilute H_2SO_4. Write the balanced equations involved in the reactions and calculate the molarity of H_2O_2.

Watch Video Solution

Example 22

1. $5mL$ of $8NHNO_3, 4.8mL$ of $5NHCl$ and a certain volume of $17MH_2SO_4$ are mixed together and made upto 2litre. $30mL$ of this acid mixture exactly neutralizes $42.9mL$ of Na_2CO_3 solution containing $1gNa_2CO_3$. $10H_2O\text{in}100mL$ of water. Calculate the amount of sulphate ions in g present in solution.

Watch Video Solution

2. A sample of $MnSO_4.4H_2O$ is strongly heated in air. The residue (Mn_3O_4) left was dissolved in $100mL$ of $0.1NFeSO_{94})$ containing dil. H_2SO_4. This solution was completely reacted with $50mL$ of $KMnO_4$ solution. $25mL$ of this $KMnO_4$ solution was completely reduced by $30mL$ of $0.1NFeSO_4$ solution. Calculate the amount of $MnSO_4.4H_2O$ in sample.

Watch Video Solution

Example 23

1. 22.6 g of an ammonium salt were treated with 100 mL of normal NaOH solution and boiled till no more of ammonia gas was given off. The excess of NaOH solution left over required 60 mL normal sulphuric acid. Calculate the percentage of ammonia in the salt.

Watch Video Solution

2. 50 mL sample of ozonised oxygen at NTP was passed through a solution of potassium iodide. The liberated iodine required 15 mL of $0.08NNa_2S_2O_3$ solution for complete titration. Calculate the volume of ozone at NTP in the given sample.

View Text Solution

Example 24

1. A small amount of $CaCO_3$ completely neutralises 525 mL of 0.1 N HCl and no acid is left in the end. After converting all calcium chlorine to $CaSO_4$, how much plaster of Paris can be obtained ?

Watch Video Solution

2. 10 mL of a potassium dichromate solution liberates iodine from potassium iodide solution. When the iodine was titrated with hypo solution $(N/20)$, the titre value was 15 mL. Find the concentration of dichromate solution in g per litre.

Watch Video Solution

Example 25

1. $25mL$ of $0.107MH_3PO_4$ was titrated with $0.115M$ solution of $NaOH$ to the end point identified by indicator bromocresol green.This required $23.1mL$. The titration was repeated using phenolphthalein as

indicator. This time $25mL$ of $0.107MH_3PO_4$ reuired $46.2mL$ of the $0.115MNaOH$. What is the coefficient of n in this equation for each reaction?

$$H_3PO_4 + nOH^- \rightarrow nH_2O + [H_{3-n}PO_4]^{n-}$$

Watch Video Solution

2. 1.5 g of sample of impure potassium dichromate was dissolved in water and made up to 500 mL solution . 25 mL of this solution required iodometrically 24 mL of a sodium thiosulphate solution. 26 mL of this sodium thisulphate solution required 25 mL of $N/20$ solution of pure potassium dichromate. Find the percentage purity of impure sample of potassium dichromate.

View Text Solution

Example 26

1. 11.2 g carbon reacts completely with 19.63 litre O_2 at NTP. The cooled gases are pased through 2 litre of 2.5 N NaOH solution. Calculate concentration of remaining NaOH and Na_2CO_3 in solution. (CO does not react with NaOH under these conditions.)

View Text Solution

2. 5 g of a sample of brass were dissolved in 1 litre dil. H_2SO_4. 20 mL of this solution were mixed with KI and liberated iodine required 20 mL of 0.0327 N hypo solution for titration. Calculate the amount of copper in the alloy.

View Text Solution

Example 27

1. One litre sample of water contains 0.9 mg $CaCl_2$ and 0.9 mg of $MgCl_2$. Find the total hardness in terms of parts permillion of $CaCO_3$.

Watch Video Solution

2. An excess KI solution is mixed in a solution of $K_2Cr_2O_7$ and liberated iodine required 72 mL of 0.05 N $Na_2S_2O_3$ for complete reaction. How many grams of $K_2Cr_2O_7$ were present in the solution of $K_2Cr_2O_7$? The reaction occurs as :

$$Cr_2O_7^{2-} + 6I^- + 14H^+ \rightarrow 2Cr^{3+} + 3I_2 + 7H_2O$$

View Text Solution

Illustrations

1. A metal M of equivalent mass E forms an oxide of molecular formula M_xO_y The atomic mass of the metal is given by the correct equation .

A. $\frac{2En}{m}$

B. 2mEn

C. $\frac{E}{n}$

D. $\frac{ME}{2n}$

Answer: A

Watch Video Solution

2. In the reaction,

$$FeS_2 + KMnO_4 + H^+ \rightarrow Fe^{3+} + SO_2 + Mn^{2+} + H_2O$$

the equivalent mass of FeS_2 would be equal to :

A. molar mass

B. $\frac{\text{molar mass}}{10}$

C. $\frac{\text{molar mass}}{11}$

D. $\frac{\text{molar mass}}{13}$

Answer: C

Watch Video Solution

3. The equivalent mass of H_3BO_3 in its reaction with NaOH to form $Na_2B_4O_7$ is equal to :

A. $\text{molar mass}/4$

B. $\text{molar mass}/3$

C. $\text{molar mass}/2$

D. molar mass

Answer: D

Watch Video Solution

4. For the reaction, $N_2(g) + 3H_2(g) \rightarrow 2NH_3(g)$, if molecular masses of NH_3 and N_2 and M_1 andM_2, their equivalent masses are

E_1 and E_2, then $(E_1 - E_2)$ is :

A. $\frac{2M_1 - M_2}{6}$

B. $M_1 - M_2$

C. $3M_1 - M_2$

D. $M_1 - 3M_2$

Answer: A

Watch Video Solution

5. X gm of metal gave Y gm of its oxide, so equivalent mass of metal is :

A. $\left(\frac{X}{Y - X}\right) \times 8$

B. $\left(\frac{Y - X}{X}\right) \times 8$

C. $\left(\frac{Y + X}{X}\right) \times 8$

D. $\frac{X}{Y} \times 8$

Answer: A

Watch Video Solution

6. $KMnO_4$ (m.w.=158) oxidises oxalic acid in acid medium to CO_2 and water as follows :

$$5C_2O_4^{2-} + 2MnO_4^- + 16H^+ \rightarrow 10CO_2 + 2Mn^{2+} + 8H_2O$$

What is the equivalent weigth of $KMnO_4$?

A. 158

B. 31.6

C. 39.5

D. 79

Answer: B

Watch Video Solution

7. The formula mass of Mohr's salt is 392. The iron present in it is oxidised by $KMnO_4$ in acid medium. The equivalent mass of Mohr's salt is :

A. 392

B. 31.6

C. 278

D. 156

Answer: A

Watch Video Solution

8. In a redox reaction, dichromate ion $\left(Cr_2O_7^{2-}\right)$ is reduced to Cr^{3+} ion, the equivalent mass of $K_2Cr_2O_7$ in this reaction is :

A. $\frac{\text{molecular mass}}{3}$

B. $\frac{\text{molecular mass}}{6}$

C. $\frac{\text{molecular mass}}{1}$

D. $\frac{\text{molecular mass}}{2}$

Answer: B

Watch Video Solution

9. How many grams of $NaHCO_3$ are required to neutralise 1 mL of 0.0902 N vinegar ?

A. $8.4 \times 10^{-3} g$

B. $1.5 \times 10^{-3} g$

C. $0.758 \times 10^{-3} g$

D. $1.07 \times 10^{-3} g$

Answer: C

Watch Video Solution

10. $0.7g$ of $Na_2CO_3.xH_2O$ were dissolved in water and the volume was made to $100mL$, $20mL$ of this solution required $19.8mL$ of $N/10HCl$ for complete neutralization. The value of x is:

A. 7

B. 3

C. 2

D. 5

Answer: C

Watch Video Solution

11. Calculate the equivalent mass of Na_2CO_3 when it is titrated against HCl in presence of phenolphthalein.

A. 106

B. 53

C. 26.5

D. 212

Answer: A

Watch Video Solution

12. 1 mol H_2SO_4 will exactly neutralise :

A. 2 mol of ammonia

B. 1 mol of $Ba(OH)_2$

C. 0.5 mol of $Ba(OH)_2$

D. 2 mol of KOH

Answer: A::B::D

Watch Video Solution

13. Which of the following gives equivalent mass of Na_2CO_3 when titrated against HCl in the presence of methyl orange ?

A. 5.3

B. 53

C. 10.6

D. 106

Answer: B

Watch Video Solution

14. How many moles of MnO_4^- ions will react with 1 mole of ferrous oxalate in acid medium ?

A. $1/5$

B. $2/5$

C. $3/5$

D. $5/3$

Answer: C

View Text Solution

15. The molecular mass of $K_2Cr_2O_7$ is 294 amu. It acts as oxidising agent in a redox titration. Its equivalent mass in acid medium will be :

A. 294

B. 49

C. 147

D. 74

Answer: B

View Text Solution

16. In acid medium, both $KMnO_4$ and $K_2Cr_2O_7$ act as oxidising agents. Which among the following is correct about the oxidising behaviou ?

A. $KMnO_4 > K_2Cr_2O_7$

B. $KMnO_4 < K_2Cr_2O_7$

C. $KMnO_4 = K_2Cr_2O_7$

D. Cannot be predicted

Answer: A

View Text Solution

17. $KMnO_4$ reacts with oxalic acid according to the equation,

$2MnO_4^- + 5C_2O_4^{2-} + 16H^+ \rightarrow 2Mn^{2+} + 10CO_2 + 8H_2O$

Here, 20 mL of 0.1 M $KMnO_4$ is equivalent to :

A. 120 mL of 0.25M $H_2C_2O_4$

B. $150mL$ of$0.1MH_2C_2O_4$

C. $50mL$ of$0.1MH_2C_2O_4$

D. $50mL$ of$0.2MH_2C_2O_4$

Answer: C

View Text Solution

18. A solution of H_2O_2 is titrated against a solution of $KMnO_4$.

The reaction is :

$2MnO_4^- + 5H_2O_2 + 6H^+ \rightarrow 2Mn^{2+} + 5O_2 + 8H_2O$

If it requires 46.9 mL of 0.145 M $KMnO_4$ to oxidise 20 g of H_2O_2, the mass percentage of H_2O_2 in this solution is :

A. 2.9

B. 29

C. 21

D. 4.9

Answer: A

View Text Solution

19. In an oxidation-reduction, MnO_4^- ion is converted to Mn^{2+}, what is the number of equivalents of $KMnO_4$ (mol. Wt.=158) present in 250 mL of 0.04 M $KMnO_4$ solution ?

A. 0.02

B. 0.05

C. 0.04

D. 0.07

Answer: B

View Text Solution

20. The strenth of 10 volume of H_2O_2 solution is :

A. 10

B. 68

C. 60.70

D. 30.36

Answer: D

View Text Solution

Practice Problems

1. Calculate the equivalent mass of underlines species :

1. $Na_2SO_3 + \underline{Na_2CrO_4} \rightarrow Na_2SO_4 + Cr(OH)_3$

(ii) $Fe_3O_4 + \underline{KMnO_4} \rightarrow Fe_2O_3 + MnO_2$

(iii) $\underline{2Na_2S_2O_3} + I_2 \rightarrow Na_2S_4O_6 + 2NaI$

(iv) $\underline{As_2S_3} + 10NO_3^- + 4H^+ \rightarrow 10NO_2 + 2AsO_4^{3-} + 3S + 2H_2O$

(v) $\underline{H_3PO_3} \rightarrow H_3PO_4 + PH_3$

(vi)

$$\underline{5SO_2} + 2KMnO_4 + 2H_2O \rightarrow K_2SO_4 + 2MnSO_4 + 2H_2\_(2)SO_4$$

View Text Solution

2. 12 mL of 0.2 N sulphuric acid is neutralised with 15 mL of sodium hydroxide solution on titration. Calculate the normality of sodium hydroxide solution.

View Text Solution

3. What will be the volume of $N/10$ solution of oxalic acid obtained by dissolving 63 g of oxalic acid ?

View Text Solution

4. If 1.26 g of oxalic acid is dissolved in 250 mL of solution, find its normality. The equivalent mass of oxalic acid is 63.

View Text Solution

5. (a) 50 mL of $0.2NKMnO_4$ is required for complete oxidation of 0.45 g of anhydrous oxalic acid. Calculate the normality of oxalic acid solution.

(b) In the titration of Fe^{2+} ions with $KMnO_4$ in acid medium, why is dilute H_2SO_4 used and not dilute HCl ?

View Text Solution

6. 30 mL of sodium carbonate solution is mixed with 20 mL of 0.8 N sulphuric acid. The resultant solution needed 20 mL of 0.7 N hydrochloric acid solution for complete neutralisation. Determine the strength of the sodium carbonate in gram per litre. (Take sodium carbonate to be anhydrous.)

View Text Solution

7. 0.25 g of an oxalate salt was dissolved in 100 mL of water. 10 mL of this solution required 8 mL of $N/20 KMnO_4$ for its oxidation. Calculate the percentage of oxalate in the salt.

View Text Solution

8. 1.13 g of an ammonium sulphate were treated with 50 mL of normal NaOH solution and boiled till no more ammonia was given off. The excess of the alkali solution left over was titrated with normal H_2SO_4. The volume required was 30 mL. Find out the percentage of NH_3 in the salt.

View Text Solution

9. The normality of the mixture of HCl and H_2SO_4 solution is $N/5$. 0.287 g of AgCl is obtained when 20 mL of this solution is treated with excess of $AgNO_3$. Calculate the percentage of both the acids in the mixture.

View Text Solution

10. 1.17 g of an impure sample of oxalic acid was dissolved and made up to 200 mL with water. 10 mL of this solution in acid medium required 8.5 mL of a solution of potassium permanganate containing 3.16 g per litre of oxidation. Calculate the percentage purity of oxalic acid.

View Text Solution

11. What amount of silver chloride will be obtained when 20 mL $N/20$ HCl is made to react with excess of $AgNO_3$?

View Text Solution

12. 1.0 g carbonate of a metal was dissolved in 50 mL $N/20$ HCl solution. The resulting liquid required 25 mL of $N/5$ NaOH solution to

neutralise it completely. Calculate the equivalent mass of the metal carbonate.

View Text Solution

13. 0.35 g of a metal was dissolved in 50 mL N-acid. The whole solution then required 20.85 mL of normal alkaline solution to neutralise the excess of the acid. Calculate the equivalent mass of the metal.

View Text Solution

14. 2.650 g of anhydrous sodium carbonate are dissolved in water and the solution made up to 500 mL. On titration 50 mL of this solution neutralises 50 mL of a solution of sulphuric acid. How much water should be added to 450 mL of this acid as to make it exactly $N/12$?

View Text Solution

15. Two acids A and B titrated separately each time with 25 mL of N Na_2CO_3 solution and require 10 mL and 40 mL respectively for complete neutralisation. What volume of A and B would you mix to produce one litre of normal acid solution ?

View Text Solution

16. 1.64 g of a mixture of calcium carbonate and magnesium carbonate were dissolved in 50 mL of 0.8 N hydrochloric acid. The excess of the acid required $16mLN/4$ sodium hydroxide solution for neutralisation. Find out the percentage composition of the mixture of two carbonates.

View Text Solution

17. 30 mL of $N/10$ HCl are required to neutralise 50 mL of a sodium carbonate solution. How many mL of water must be added to 30 mL of

this solution so that the solution obtained may have a concentration equal to $N/50$?

View Text Solution

18. 2.65 g of diacidic base was dissolved in water and made up to 500 mL. 20 of this solution completely neutralised 12 mL of $N/6$ HCl. Find out the equivalent mass and molecular mass of the base.

View Text Solution

19. In a sample of sodium carbonate, some sodium sulphate is mixed. 2.50 g of this sample is dissolved and the volume made up to 500 mL . 25 mL of this solution neutralises 20 mL of $N/10$ in the sample.

View Text Solution

20. Some amount of NH_4Cl was boiled with 50 mL of 0.75N NaOH solution till the reaction was complete. After the completion of the reaction, 10 mL of $0.75NH_2SO_4$ were required for the neutralisation of the remaining NaOH. Calculate the amount of NH_4Cl taken.

View Text Solution

21. 25 mL of a mixed solution of sodium carbonate and sodium bicarbonate required 10 mL of $N/20$ HCl when titrated in the presence of phenolphthalein but 25 mL of the same when titrated separately in presence of methyl orange required 25 mL of $N/10$ HCl. Calculate the amount of anhydrous sodium carbonate and bicarbonate in grams per litre of the solution.

View Text Solution

22. 4 g of a mixture of NaCl and Na_2CO_3 were dissolved in water and volume made up to 250 mL. 15 mL of this solution required 50 mL of $N/10$ HCl for complete neutralisation. Calculate the percentage composition of the original mixture.

View Text Solution

23. 40 mL of a mixture of Na_2CO_3 and NaOH when titrated against $N/10$ HCl, the end point with phenolphthalein was reached at 25 mL of HCl and at this stage methyl orange was added, the quantity of acid further required for second end point was 5 mL. Calculate the amount of Na_2CO_3 and NaOH in g/L of the solution.

View Text Solution

24. Find out the percentage of oxalate in a given sample of an oxalate salt of which when 0.3 g were dissolved in 100 mL of water required 90

mL of $N/20 KMnO_4$ solution for complete oxidation.

View Text Solution

25. A 1.0 g sample of H_2O_2 solution containing 'x' per cent by weight requires x mL of $KMnO_4$ solution for complete oxidation under acidic conditions. Calculate the normality of the $KMnO_4$ solution.

View Text Solution

26. 25 g of a sample of ferrous sulphate was dissolved in water containing dilute H_2SO_4 and the volume made up to one litre. 25 mL of this solution required 20 mL of $N/10 KMnO_4$ solution for complete oxidation. Calculate the percentage of $FeSO_4.7H_2O$ in the sample.

View Text Solution

27. A sample of KCl is contaminated with NaCl. 4.176 g of the sample is dissolved in distilled water and the solution is made to 500 mL . 25 mL of the above solution required 27.50 mL of a solution of silver nitrate (normality factor 0.115) to react completely with it. Calculate the percentage contamination of the sample.

View Text Solution

28. The saponification number of fat or oil is defined as the number of mg of KOH required to saponify 1 g oil or fat. A sample of peanut oil weighing 1.5763 g is added to 25 mL of 0.421 M KOH. After saponification is complete, 8.46 mL of $0.2732MK_2SO_4$ is needed to neutralise excess of KOH. What is the saponification number of peanut oil ?

View Text Solution

29. 500 mL of 2 M HCl, 100 mL of 2 M H_2SO_4 and one gram equivalent of monoacidic alkali are mixed together. 30 mL of this solution required 20 mL of $Na_2CO_3.xH_2O$ solution obtained by dissolving 143 g $Na_2CO_3.xH_2O$ in one litre solution. Calculate the water of crystallisation of $Na_2CO_3.xH_2O$.

View Text Solution

30. 1 g of the complex $\left[Cr(H_2O)_5Cl\right]Cl_2.H_2O$ was passed through a cation exchanger to produce HCl. The acid liberated was diluted to 1 litre. What is the normality of this acid solution ?

View Text Solution

31. 5.0 g of bleaching powder was suspended in water and volume made up to half a litre. 20 mL of this suspension when acidified with acetic acid and treated with excess of KI solution liberated iodine which

required 20 mL of a decinormal hypo solution for titration. Calculate percentage of available chlorine in bleaching powder.

View Text Solution

32. To a solution of excess of KI in dilute H_2SO_4. 25 mL of an unknown solution of $KMnO_4$ were added. The liberated iodine was exactly reduced by 42.5 mL of $N/10 Na_2S_2O_3$ solution. Calculate the concentration of $KMnO_4$ solution.

View Text Solution

33. In 20 mL of a solution of HCl, 3 g of $CaCO_3$ were dissolved, 0.5 g of $CaCO_3$ being left undissolved. Find out the strength of this solution in terms of (i) normality and (ii) g/L. Find the volume of this acid which would be required to make 1 litre of normal solution of this acid.

View Text Solution

34. 1.0 litre of a solution contains 5.3 g of Na_2CO_3 and 8 g of NaOH. 20 mL of this solution are taken and titrated against $N/10$ HCl using separately (a) methyl orange as an indicator and (b) phenolphthalein as an indicator. What will be the titre values in these two cases ?

View Text Solution

35. To 20 mL of a copper solution after necessary treatment were added excess of KI and the liberated iodine required 11.2 mL decinormal solution of hypo. Express the strength of the original solution in grams of copper per litre of the solution.

View Text Solution

36. 0.28 g of a commercial sample of $K_2Cr_2O_7$ was dissolved in water. Excess of KI was added to it along with dilute H_2SO_4. Iodine liberated was then titrated against sodium thiosulphate solution containing

24.82 g of $Na_2S_2O_3.5H_2O$ per litre. The thiosulphate solution required was 50 mL. Find the percentage purity of the sample of $K_2Cr_2O_7$.

View Text Solution

37. A mixture containing KCl and NaCl was dissolved and total halide was determined by titration with silver nitrate. A sample weighing 0.3250 g required 51 mL of 0.1 N solution. Calculate the percentage of each salt in the sample.

View Text Solution

38. 1.355 g of pyrolusite sample are added to 50 mL of 1 N oxalic acid solution containing sulphuric acid. After the reaction is completed, the contents are transferred to a measuring flask and the volume made up to 200 mL. 20 mL of this solution is titrated against $KMnO_4$ solution

whose strength is $2g/L$ and 31.6 mL of $KMnO_4$ solution are required. Calculate the percentage purity in the given sample of pyrolusite.

View Text Solution

39. 0.5 g of bleaching powder was suspended in water an excess of KI added. On acidifying with dilute H_2SO_4 iodine was liberated which required 50 mL of $N/10$ hypo solution. Calculate the percentage of available chlorine in bleaching powder.

View Text Solution

40. Calculate the number of oxalic acid molecules in 100 mL of 0.02 N oxalic acid solution.

View Text Solution

41. 1.26 g of a dibasic acid were dissovled in water and made up to 200 mL. 20 mL of this solution were completely neutralised by 10 mL of $N/5$ caustic soda solution. Calculate the equivalent mass and molecular mass of the acid.

View Text Solution

42. 3.0 g of a sample of impure ammonium chloride were boiled with excess of caustic soda solution. Ammonia gas so evolved was passed into 120 mL of $N/2H_2SO_4$. 28 mL of $N/2$ NaOH were required to neutralise residual acid. Calculate the percentage of purity of the given sample of ammonium chloride.

View Text Solution

43. 2.20 g of an ammonium salt were boiled with 75 mL of NaOH till the emission of ammonia gas ceased. The excess of unused NaOH solution

required 70 mL of $N/2$ sulphuric acid for neutralisation. Calculate the percentage of ammonia in the salt.

View Text Solution

44. 3.45 g of a metallic carbonate were mixed with 240 mL of $N/4$ HCl. The excess acid was neutralised by 50 mL of $N/5$ KOH solution. Calculate the equivalent mass of the metal.

View Text Solution

45. (a) 2 g of metal carbonate were dissolved in 50 mL of N HCl. 100 mL of 0.1 N NaOH were required to neutralise the resultant solution. Calculate the equivalent mass of the metal carbonate.

(b) How much water should be added to 75 mL of 3 N HCl ot make it a normal solution ?

View Text Solution

46. Upon mixing 45.0 mL of 0.25 M lead nitrate solution with 25 mL of 0.1 M chromic sulphate solution, precipitation of lead sulphate takes place. How many moles of lead sulphate are formed ? Also calculate the molar concentrations of the species left behind in the final solution. Assume that lead sulphate is completely insoluble.

View Text Solution

47. In an ore the only oxidisable material is Sn^{2+}. This ore is titrated with a dichromate solution containing $2.5gK_2Cr_2O_7$ in 0.50 litre. A 0.40 g of sample of the ore required $10.0cm^3$ of the titrant to reach equivalent point. Calculate the percentage of tin in ore. (K=39.1, Cr=52, Sn=118.7)

View Text Solution

48. 2.26 g of impure ammonium chloride were boiled with 100 mL of NaOH solution till no more ammonia was given off. The excess of NaOH solution left over required 30 mL $2NH_2SO_4$ for neutralisation. Calculate the percentage purity of the salt.

(H=1, N=14, O=16, Na=23, S=32, Cl=35.5)

View Text Solution

49. Metallic tin in the presence of HCl is oxidised by $K_2Cr_2O_7$ solution to stannic chloride. What volume of decinormal dichromate solution would be reduced by 1 g of Sn ?

View Text Solution

50. A 0.5 g sample containing MnO_2 is treated with HCl liberating Cl_2. The Cl_2 is passed into a solution of KI and $30.0cm^3$ of 0.1 M $Na_2S_2O_3$

are required to tirate the liberated iodine. Calculate the percentage of MnO_2 in the sample.

View Text Solution

51. 3.2 g of a mixture of calcium carbonate and sodium chloride was dissolved in 100 mL of 1.02 N HCl. After the reaction the solution was filtered and after separating the precipitate the volume was raised to 200 mL . 20 mL of this solution required $25mLN/5$ caustic soda solution for neutralisation. Find out the percentage of calcium carbonate in the mixture.

View Text Solution

52. 4 g of a mixture of Na_2SO_4 and anhydrous Na_2CO_3 were dissolved in pure and volume made up to 250 mL. 20 mL of this solution required 25 mL of $N/5H_2SO_4$ for complete neutralisation. Calculate the percentage composition of the mixture.

View Text Solution

53. A 1.2 g mixture of Na_2CO_3 and K_2CO_3 was dissolved in water to form $100cm^3$ of a solution. $20cm^3$ of this solution required $40cm^3$ of 0.1 N HCl for neutralisation. Calculate the mass of Na_2CO_3 and K_2CO_3 in the mixture.

View Text Solution

54. One litre of a mixture of O_2 and O_3 at NTP was allowed to react with an excess of acidified solution of KI. The iodine liberated required 40 mL of $M/10$ sodium thiosulphate solution for titration. What is the weight per cent of ozone in the decompose ozone. Assuming that one photon can decompose one ozone molecule, how many photon can decompose required for the complete decomposition of ozone in the original mixture ?

View Text Solution

55. 20 mL of a solution containing 0.2 g of impure sample of H_2O_2 reacts with 0.316 g of $KMnO_4$ (acidic). Calculate :

(a) Purity of H_2O_2

(b) Volume of dry O_2 evolved at $27^\circ C$ and 750 mm pressure.

View Text Solution

56. Five gram of copper alloy was dissolved in one litre of dilute H_2SO_4. 20 mL of this solution was titrated iodometrically and it required 20 mL of a hypo solution. 20 mL of $K_2Cr_2O_7$ which contained 2.4 g per litre, in presence of H_2SO_4 and excess of KI, required 30 mL of the same hypo solution. Calculate the % purity of copper in the alloy.

View Text Solution

57. How many millilitres of 0.5 M H_2SO_4 are needed to dissolve 0.5 g of copper (II) carbonate ?

View Text Solution

58. An aqueous solution containing 0.10 g KIO_3 (formula weight =214.0) was treated with an excess of KI solution. The solution was acidified with HCl. The liberated iodine consumed 45.0 mL of thiosulphate solution to decolourise the blue starch-iodine complex. Calculate the molarity of the sodium thiosulphate solution.

View Text Solution

59. Grastric juice contains 3 g of HCl per litre. If a person produces 2.5 litre of gastric juice per day, how many antacid tablets each containing 400 mL of $Al(OH)_3$ are needed to neutralise all the HCl produced in one day ?

View Text Solution

60. A mixture of KOH and Na_2CO_3 solution required 15 mL of $N/20$ HCl using phenolphthalein as indicator. The same amount of alkali mixture when titrated using methyl orange as indicator required 25 mL of same acid. Calculate amount of KOH and Na_2CO_3 present in solution.

View Text Solution

61. $1000mLO_2$ at NTP was passed through Siemen's ozonizer so that the volume is reduced to 888 mL at same condition. Ozonized oxygen is passed through KI solution. Liberated I_2 was titrated with 0.05 N hypo. Calculate volume of hypo used.

View Text Solution

62. 30 mL of $K_2Cr_2O_7$ liberated iodine from KI solution when the iodine was titrated with hypo solution $(N/20)$, the titre value was 45

mL. Find the concentration of $K_2Cr_2O_7$ in g per litre.

View Text Solution

63. Excess of KI and dil. H_2SO_4 were mixed in $50mLH_2O_2$. The liberated I_2 required 20 mL of $0.1NNa_2S_2O_3$. Find out the strength of H_2O_2 in g per litre.

View Text Solution

64. $25mLH_2O_2$ were added to excess of acidified solution of KI. The iodine so liberated required 20 mL of 0.1 N sodium thisulphate for titration. Calculate the strength in terms of normality percentage and volume.

View Text Solution

65. Cl_2 gas can be produced in the lab by the reaction, $K_2Cr_2O_7 + 14HCl \rightarrow 2KCl + 2CrCl_3 + 7H_2O + 3Cl_2$ If a 6.13 g sample that is $96\,\%$ $K_2Cr_2O_7$ is allowed to react with 320 mL of HCl solution density $1.15g/mL$ and containing 30% by mass of HCl, what mass of Cl_2 is generated ?

View Text Solution

66. What is the weight in gram of available O_2 per litre from a solution of H_2O_2, 10 mL of which when titrated with $N/20KMnO_4$ solution required 25 mL for the reaction ?

$2KMnO_4 + 5H_2O_2 + 4H_2SO_4 \rightarrow 5O_2 + 8H_2O + 2KHSO_4 + 2MnSO_4$

View Text Solution

67. A quantity of $KMnO_4$ was boiled with HCl and the gas evolved was led into a solution of KI. When the reaction was complete, the I_2

liberated was titrated with titrated with a solution of hypo containing 124 g of $Na_2S_2O_3.5H_2O$ per litre. It was found that exactly 60 mL were required to decolourise the solution of I_2. What weight of $KMnO_4$ was used ?

View Text Solution

68. 0.5 g of a sample of bleaching powder was suspended in water and excess KI is added. On acidifying with dil. H_2SO_4. I_2 was liberated which required 50 mL of $N/10$ hypo $(Na_2S_2O_3.5H_2O)$. Calculate the percentage of available Cl_2 in bleaching powder.

View Text Solution

69. 1.2 g of a sample of $CaOCl_2$ were suspended in water made up to 100 mL. 25 mL of this solution was treated with KI and the I_2 liberated corresponded to 10 mL of $N/25$ hypo. Calculate the percentage of Cl_2 available in $CaOCl_2$.

View Text Solution

70. 1.6 g of pyrolusite was treated with 60 mL of normal oxalic acid and some H_2SO_4. The oxalic acid left undecomposed was made up to 250 mL, 25 mL of this solution required 32 mL of 0.1 N potassium permangante $(KMnO_4)$. Calcualte the percentage of pure MnO_2 in pyrolusite.

View Text Solution

71. A smaple of pyrolusite weighing 0.5 g is distilled with conc. HCl. The evolved Cl_2 when passed through a solution of KI liberates sufficient I_2 to react with 125 mL of $N/12.5$ hypo $(Na_2S_2O_3.5H_2O)$. Calculate the percentage of MnO_2 in pyrolusite.

View Text Solution

72. The iodide content of a solution was determined by titration with sodium thiosulphate crystalline containing 11.2 % impurity. Calculate the normality of iodide ion solution in 250 mL of the iodide solution required 20 mL hypo (42 g hypo is dissolved in 1 litre).

View Text Solution

73. The formula weight of an acid is 82. In a titration, $100cm^3$ of a solution of this acid containing 39.0 g of the acid per litre were completely neutralised by $95.0cm^3$ of aqueous NaOH containing 40.0 g of NaOH per litre. What is the basicity of the acid ?

View Text Solution

74. 20 mL of a solution containing ferrous sulphate and ferric sulphate acidified with H_2SO_4 is reduced by metallic zinc. The solution required 27.4 mL of 0.1 N solution of $K_2Cr_2O_7$ for oxidation. However before

reduction with zinc, 20 mL of same solution required 17.96 mL of same $K_2Cr_2O_7$. Calculate the mass of $FeSO_4$ and $Fe_2(SO_4)_3$ per litre of the solution.

View Text Solution

75. 3.0 g of pyrolusite ore were treated with 20 g of pure ferrous ammonium sulphate (Mol.mass $= 392\ \text{g mol}^{-1}$) and dilute H_2SO_4. After the reaction, the solution was diluted to 500 mL. 50 mL of diluted solution required 10 mL of 0.1 N $K_2Cr_2O_7$ solution. Calculate the % of pure MnO_2 in pyrolusite.

View Text Solution

76. To measure the quantity of $MnCl_2$ dissolved in an aqueous solution, it was completely converted to $KMnO_4$ using the reaction.

View Text Solution

Objective Question Level A

1. A normal solution :

A. contains one gram equivalent mass of the substance in one litre solution

B. contains one gram molecular mass of the substance in one litre solution

C. contains one gram equivalent mass of the substance in 100 mL of the solution

D. is that whose concentration is known

Answer: A

View Text Solution

2. Which one of the following is a standard solution ?

A. It contains one gram equivalent mass of the substance in one litre solution

B. Its strength is accurately known

C. Its strength is to be determined

D. A solution which has been prepared from pure substance

Answer: B

View Text Solution

3. The molecular mass of H_3PO_3 is 82. Its equivalent mass, if it is completely neutralised, is:

A. 82

B. 27.3

C. 41

D. 246

Answer: C

View Text Solution

4. The molecular mass of Mohr's salt, $FeSO_4(NH_4)_2SO_4.6H_2O$, is 392. Its equivalent mass is :

A. 196

B. 39.2

C. 98.0

D. 392

Answer: D

View Text Solution

5. According to the following equation,

$K_2Cr_2O_7 + 4H_2SO_4 \rightarrow K_2SO_4 + Cr_2(SO_4)_3 + 4H_2O + 3[O]$ the

equivalent mass of $K_2Cr_2O_7$ is :

A. $\text{mol. Mass}/3$

B. $\text{mol.mass}/6$

C. mol.mass

D. $\text{mol.mass}/12$

Answer: B

View Text Solution

6. Amount of oxalic acid required to prepare 250 mL of $N/10$ solution (Mol. Mass of oxalic acid =126) is :

A. 1.5759 g

B. $3.15g$

C. $15.75g$

D. 63.0 g

Answer: A

View Text Solution

7. Normality of 2 % H_2SO_4 solution by volume is nearly :

A. 2

B. 4

C. 0.2

D. 0.4

Answer: D

View Text Solution

8. The molecular mass of $KMnO_4$ is M. Its equivalent mass in acidic medium will be :

A. M

B. $M/2$

C. $M/5$

D. $M/4$

Answer: C

View Text Solution

9. When $KMnO_4$ is reduced with oxalic acid in acidic medium, the oxidation number of Mn changes from :

A. 7 to 4

B. 6 to 4

C. 7 to 2

D. 4 to 2

Answer: C

View Text Solution

10. For the half cell reaction,

$2BrO_3^- + 12H^+ + 10e \rightarrow Br_{26H_2O}$

the equivalent mass of sodium bromate is :

A. equal to its mol. Mass

B. $1/3$ of its mol. Mass

C. $1/6$ of its mol. Mass

D. $1/5$ of its mol. Mass

Answer: D

View Text Solution

11. In the reaction,

$I_2 + 2S_2O_3^{2-} \rightarrow 2I^- + S_4O_6^{2-}$

equivalent mass of iodine is :

A. equal to its molecular mass

B. $1/2$ the molecular mass

C. $1/4$ the molecular mass

D. twice the molecular mass

Answer: B

View Text Solution

12. A molal solution is one that contains one mole of the solute in :

A. 1000 g of the solvent

B. one litre of the solvent

C. one litre of the solution

D. 22.4 litre of the solvent

Answer: A

View Text Solution

13. In alkaline conditions, $KMnO_4$ reacts as follows,

$2KMnO_4 + 2KOH \rightarrow 2K_2MnO_4 + H_2O + [O]$

Therefore, its equivalent mass will be :

A. 31.6

B. 52.7

C. 72

D. 158.0

Answer: D

View Text Solution

14. 0.1 N solution of Na_2CO_3 is being titrated with 0.1 N HCl, the best indicator to be used is :

A. potassium ferricyanide`

B. phenolphthalein

C. methyl orange

D. litmus

Answer: C

View Text Solution

15. For the preparation of a litre of $N/10$ solution of H_2SO_4, we need :

A. 9.8 g

B. 4.9 g

C. 10 g

D. 98 g

Answer: B

View Text Solution

16. Molecular mass of a tribasic acid is M. Its equivalent mass will be :

A. $M/3$

B. $3M$

C. $M/2$

D. $2M$

Answer: A

View Text Solution

17. A solution containing Fe^{2+} ions is titrated with $KMnO_4$ solution, Indicator used will be :

A. phenolphthalein

B. methyl orange

C. litmus

D. none of these

Answer: D

View Text Solution

18. If 200 mL of $N/10$ HCl were added to 1 g calcium carbonate, what would remain after the reaction ?

A. $CaCO_3$

B. HCl

C. Neither of the two

D. Parth of both

Answer: C

View Text Solution

19. How many mL of $1MH_2SO_4$ acid solution is required to neutralise 10 mL of 1 M NaOH ?

A. 5 mL

B. 2.5 mL

C. 10 mL

D. 20 mL

Answer: A

View Text Solution

20. 200 mL of 3 N HCl were mixed with 200 mL of 6 N H_2SO_4 solution. The final normality of H_2SO_4 in the resultant solution will be:

A. 9 N

B. 3 N

C. 6 N

D. 2 N

Answer: B

View Text Solution

21. The volume of water to be added to 400 mL of $N/8$ HCl to make it exactly $N/12$, is :

A. 400 mL

B. 300 mL

C. 200 mL

D. 100 mL

Answer: C

View Text Solution

22. 100 mL of 0.3 N HCl were mixed with 200 mL of $0.6NH_2SO_4$ solution. The final normality of acid was :

A. 0.4 N

B. 0.5 N

C. 0.6 N

D. 0.9 N

Answer: B

View Text Solution

23. The M mass of NaOH is 40.50 mL of a solution containing 2 g of NaOH in 500 mL will require for complete neutralisation :

A. 10 mL decinormal HCl

B. 20 mL decinormal HCl

C. 50 mL decinormal HCl

D. 25 mL decinormal HCl

Answer: C

View Text Solution

24. 50 g of a sample of NaOH required for complete neutralisation, 1 litre N HCl. What is the percentage purity of NaOH ?

A. 80

B. 70

C. 60

D. 50

Answer: A

View Text Solution

25. Weight of iodine required to oxidise 500 mL N $Na_2S_2O_3$ solution, is :

A. 6.35 g

B. 63.5 g

C. 127 g

D. 254 g

Answer: B

View Text Solution

26. $25mLNK_2Cr_2O_7$ acidified solution will liberate .. Iodine from KI solution.

A. 0.3175 g

B. 3.175 g

C. 31.75 g

D. 317.5 g

Answer: B

View Text Solution

27. The indicator used in iodometric titrations is :

A. phenolphthalein

B. litmus

C. potassium iodide

D. starch

Answer: D

View Text Solution

28. Which of the following acids is added in the titration of oxalic acid and potassium permanganate ?

A. HNO_3

B. HCl

C. CH_3COOH

D. H_2SO_4

Answer: D

View Text Solution

29. In the titration of $K_2Cr_2O_7$ iodometrically, near the end point the colour of the solution becomes :

A. green

B. red

C. yellow

D. blue

Answer: A

View Text Solution

30. In the titration of ferrous ammonium sulphate and potassium dichromate, the external indicator used is :

A. KCNS

B. NH_4CNS

C. $K_3Fe(CN)_6$

D. $K_4Fe(CN)_{60}$

Answer: C

View Text Solution

31. 0.1 N solution of a dibasic acid can be prepared by dissolving 0.45 g of the acid in water and diluting to 100 mL. The molecular mass of the acid is :

A. 45

B. 90

C. 135

D. 180

Answer: B

View Text Solution

32. 100 mL of 0.2 N HCl solution is added to 100 mL of 0.2 N $AgNO_3$ solution. The molarity of nitrate ions in the resulting mixture will be :

A. 0.05 M

B. 0.5 M

C. 0.1 M

D. 0.2 M

Answer: C

View Text Solution

33. In an experiment, 20 mL of a decinormal HCl solution was added to 15 mL of a decinormal $AgNO_3$ solution. AgCl was precipitated out and excess of acid was titrated with $N/20$ NaOH solution. The volume of NaOH required was :

A. 10 mL

B. 20 mL

C. 30 mL

D. 5 mL

Answer: A

View Text Solution

34. Iodine solution is prepared by dissolving iodine in :

A. NaOH

B. Na_2CO_3

C. H_2O

D. KI

Answer: D

View Text Solution

35. Which one of the following is not a primary standard :

A. Oxalic acid

B. Sodium thiosulphate

C. Sodium hydroxide

D. Potassium dichromate

Answer: C

View Text Solution

36. Which one of the following is a primary standard ?

A. $KMnO_4$

B. $CuSO_4.5H_2O$

C. I_2

D. H_2SO_4

Answer: B

View Text Solution

37. When 10 mL of 10 M solution of H_2SO_4 and 100 mL of 1 M solution of NaOH are mixed, the resulting solution will be :

A. acidic

B. neutral

C. alkaline

D. Cannot be predicted

Answer: A

View Text Solution

38. 1.0 g of metal carbonate neutralises 200 mL of 0.1 N HCl. The equivalent mass of the metal will be :

A. 50

B. 40

C. 20

D. 100

Answer: A

View Text Solution

39. The normality of a 26 % $\mathrm{mass/volume}$ solution of ammonia (density $0.885 g/mL$) is approximately :

A. 1.5

B. 4

C. 0.4

D. 15.3

Answer: D

View Text Solution

40. The molarity of pure water is :

A. 18 M

B. 50.0 M

C. 55.6 M

D. 100 M

Answer: C

View Text Solution

41. 5.0 g of H_2O_2 is present in 100 mL of the solution. The molecular mass of H_2O_2 is 34. The molarity of the solution is :

A. 1.5 M

B. 0.15 M

C. 3.0 M

D. 50 M

Answer: A

View Text Solution

42. 2 N solution of sodium carbonate is equivalent to a solution of strength :

A. 106 g per 100 mL

B. 53 g per 100 mL

C. 10.6 g per 100 mL

D. 5.3 g per 100 mL

Answer: C

View Text Solution

43. Which one of these solution has the highest normality ?

A. 8 g KOH per 100 mL

B. 0.5 M H_2SO_4

C. 6 g per of NaOH per 100 mL

D. $1NH_3PO_4$

Answer: C

View Text Solution

44. 1 g of a metal required 50 mL of 0.5 N HCl to dissovle it. The equivalent mass of the metal is :

A. 25

B. 50

C. 20

D. 40

Answer: D

View Text Solution

45. What volume of CO_2 at NTP will be liberated by the action of 100 mL of 0.2 N HCl on $CaCO_3$?

A. 112 mL

B. 224 mL

C. 448 mL

D. 120 mL

Answer: B

View Text Solution

46. The equivalent mass of phosphoric acid (H_3PO_4) is 49. It behaves as . . . . Acid.

A. monobasic

B. dibasic

C. tribasic

D. tetrabasic

Answer: B

View Text Solution

47. The normality of 10 % $(\text{mass}/\text{volume})$ acetic acid is :

A. 1 N

B. 10 N

C. 1.7 N

D. 0.83 N

Answer: C

View Text Solution

48. Equivalent mass of $KMnO_4$, when it is converted to $MnSO_4$, is :

A. $M/5$

B. $M/3$

C. $M/6$

D. $M/2$

Answer: A

View Text Solution

49. How many grams of CH_3OH would have to be added to water to prepare 150 mL of a solution that is 2.0 M CH_3OH ?

A. 9.6

B. 2.4

C. 9.6×10^3

D. 4.3×10^2

Answer: A

View Text Solution

50. On dissolving 1 mole of each of the following acids in one litre water, the acid which does not give a solution of strength 1 N is :

A. HCl

B. $HClO_4$

C. HNO_3

D. H_3PO_4

Answer: D

View Text Solution

51. 0.16 g a dibasic acid required 25 mL of decinormal NaOH solution for complete neutralisation. The molecular mass of the acid is :

A. 32

B. 64

C. 128

D. 256

Answer: C

View Text Solution

52. 5 mL of N HCl, 20 mL of $N/20 H_2SO_4$ and 30 mL of $N/3 HNO_3$ are mixed together and volume made to one litre. The normality of the resulting solution is :

A. $N/5$

B. $N/10$

C. $N/20$

D. $N/40$

Answer: D

View Text Solution

53. The equivalent mass of $MnSO_4$ is half its molecular mass when it is converted to :

A. Mn_2O_3

B. MnO_2

C. MnO_4^-

D. MnO_4^{2-}

Answer: B

View Text Solution

54. For the redox reaction,

$$MnO_4^- + C_2O_4^{2-} + H^+ \rightarrow Mn^{2+} + CO_2 + H_2O$$

the correct coefficients of the reactants for the balanced reaction are :

A.

MnO_4^-	$C_2O_4^{2-}$	H^+
2	5	16

B.

MnO_4^-	$C_2O_4^{2-}$	H^+
16	5	2

C.

MnO_4^-	$C_2O_4^{2-}$	H^+
5	16	2

D.

MnO_4^-	$C_2O_4^{2-}$	H^+
2	16	5

Answer: A

View Text Solution

55. 100 mL solution consists 4 g caustic soda. The normality of the solution is :

A. 1.0

B. 0.1

C. 0.5

D. 4.0

Answer: A

View Text Solution

56. The amount of a caustic soda required for complete neutralisation of 100 mL 0.1 N HCl is :

A. 4.0 g

B. 0.04 g

C. 0.4 g

D. 2.0 g

Answer: C

View Text Solution

57. What volume of $N/2$ and $N/10$ HCl should be taken in order to make a 2 litre solution of $N/5$ strength ?

A. 0.5 litre $N/2$ HCl and 1.5 litre of $N/10$ HCl

B. 1 litre $N/2$ HCl and 1 litre $N/10$ HCl

C. 1.5 litre $N/2$ HCl and 0.5 litre $N/10$ HCl

D. 0.7 litre $N/2$ HCl and 1.3 litre $N/10$ HCl

Answer: A

View Text Solution

58. The molar concentration of the chloride ion in the solution obtained by mixing 300 mL of 3.0 M NaCl and 200 mL of 4.0 M solution of $BaCl_2$ is :

A. 1.6 M

B. 1.8 M

C. 5.0 M

D. 0.5 M

Answer: C

View Text Solution

59. The normality of 0.3 M phosphorous acid (H_3PO_3) is :

A. 0.1

B. 0.9

C. 0.3

D. 0.6

Answer: D

View Text Solution

60. A 100 mL solution of 0.1 N HCl was titrated with 0.2 N NaOH solution. The titration was discontinued after adding 30 mL of NaOH solution. The titration was completed by adding 0.25 N KOH solution. The volume of KOH required for completing the titration is :

A. 70 mL

B. 32 mL

C. 35 mL

D. 16 mL

Answer: D

View Text Solution

61. An aqueous solution of 6.3 g of oxalic acid dihydrate is made up to 250 mL. The volume of 0.1 N NaOH required to completely neutralise 10 mL of this solution is :

A. 40 mL

B. 20 mL

C. 10 mL

D. 4 mL

Answer: A

View Text Solution

62. In order to prepare one litre nomal solution of $KMnO_4$, how many grams of $KMnO_4$ are required if the solution is to be used in acid medium for oxidation ?

A. 158 g

B. 31.6 g

C. 62 g

D. 790 g

Answer: B

View Text Solution

63. 3 g of an oxide of a metal is converted to chloride completely and it yielded 5 g of chloride. Equivalent weight of the metal is :

A. 33.25

B. 3.325

C. 12

D. 20

Answer: A

View Text Solution

64. Phosphoric acid H_3PO_4 can not be neutralised to :

A. HPO_4^{2-}

B. PO_4^{2-}

C. $H_2PO_4^-$

D. HPO_3^{2-}

Answer: D

View Text Solution

65. a' g KHC_2O_4 required to reduce 100 mL of 0.02 M $KMnO_4$ in acid medium and 'b' g KHC_2O_4 neutralises 100 mL of 0.05 $MCa(OH)_2$ then :

A. a= b

B. 2a=b

C. a=2b

D. none of these

Answer: B

View Text Solution

66. Which of the following statements is not true about H_3PO_2 ?

A. It is a tribasic acid

B. One mole of it is neutralised by 0.5 mole of $Ca(OH)_2$

C. NaH_2PO_2 is not an acidic salt

D. It disproportionates to H_3PO_3 and PH_3 on heating

Answer: A

View Text Solution

67. Mixture of 1 mole BaF_2 and 2 mole H_2SO_4 can not be neutralised by :

A. 2 mole $Ba(OH)_2$

B. 2 mole $Ca(OH)_2$

C. 4 mole NaOH

D. 2 mole KOH

Answer: D

View Text Solution

68.

$28NO_3^- + 3As_2S_3 + 4H_2O \rightarrow 6AsO_4^{3-} + 28NO + 9SO_4^{2-} + 8H^+.$

What will be the equivalent mass of As_2S_3 in above reaction ?

A. $\frac{M.\ wt.}{2}$

B. $\frac{M.\ wt.}{4}$

C. $\frac{M.\ wt.}{24}$

D. $\frac{M.\ wt.}{28}$

Answer: D

View Text Solution

69. The number of moles of $KMnO_4$ that will need to react completely with one mole of ferrous oxalate in acidic solution is :

A. $2/5$

B. $3/5$

C. $4/5$

D. 1

Answer: B

View Text Solution

70. The number of moles of $KMnO_4$ that will be needed to react with one mole of sulphite ion in acidic solution is :

A. $2/5$

B. $3/5$

C. $4/5$

D. 1

Answer: A

View Text Solution

71. The equivalent weight of KIO_3 in the reaction,

$2Cr(OH)_3 + OH^- + KIO_3 \rightarrow 2CrO_4^{2-} + 5H_2O + KI$ is :

A. molecular weight

B. $\frac{\text{molecular weight}}{3}$

C. $\frac{\text{molecular weight}}{6}$

D. $\frac{\text{molecular weight}}{2}$

Answer: C

View Text Solution

72. In the reaction,

$I_2 + 2S_2O_3^{2-} \rightarrow 2I^- + S_4O_6^{2-}$

equivalent weight will be equal to :

A. $4/6$ of molecular weight

B. molecular weight

C. $2/9$ of molecular weight

D. twice the molecular weight

Answer: B

View Text Solution

73. The volume of a concentrated H_2SO_4, mixed with 0.5 N KOH to prepare $150cm^3$ of 0.2 N KOH. Solution is :

A. $50cm^3$

B. $60cm^3$

C. $70cm^3$

D. $80cm^3$

Answer: B

View Text Solution

74. For the decolorisation of 1 mole of $KMnO_4$, the number of moles of H_2O_2 required is :

A. $1/2$

B. $3/2$

C. $5/2$

D. $7/2$

Answer: C

View Text Solution

75. The product of oxidation of I^- with MnO_4^- in alkaline medium is :

A. IO_3^-

B. I_2

C. IO^-

D. IO_4^-

Answer: A

View Text Solution

76. Volume of $0.1MK_2Cr_2O_7$ required to oxidise 35 mL of $0.5MFeSO_4$ solution is :

A. 29.2 mL

B. 17.5 mL

C. 175 mL

D. 145 mL

Answer: A

View Text Solution

77. A commercial sample of H_2O_2 is labelled 10 volume. Its percentage strength is nearly :

A. 0.01

B. 0.03

C. 0.1

D. 0.9

Answer: B

View Text Solution

78. 50 mL of $10NH_2SO_4$, 25 mL of 12 N HCl and 40 mL of 5 N HNO_3 are mixed and the volume of the mixture is made 1000 mL by adding water. The normality of the resulting solution will be :

A. 1 N

B. 2 N

C. 3 N

D. 4 N

Answer: A

View Text Solution

79. Acidified $KMnO_4$ oxidizes acid to CO_2. What is the volume (in litre) of $10^{-4}MKMnO_4$ required to completely oxidize 0.5 litre of 10^{-2} M oxalic acid in acid medium ?

A. 125

B. 1250

C. 200

D. 20

Answer: D

View Text Solution

80. The concentration of oxalic acid is 'x' mol litre^{-1}. 40 mL of this solution reacts with 16 mL of 0.05 M acidified $KMnO_4$. What is the pH of 'x' M oxalic acid solution ?

(Assume that oxalic acid dissociates completely.)

A. 1.3

B. 1.699

C. 1

D. 2

Answer: C

View Text Solution

81. Consider the titration of potassium dichromate solution with acidified Mohr's salt solution using diphenylamine as indicator. The

number of moles of Mohr's salt required per mole of dichromate is :

A. 3

B. 4

C. 5

D. 6

Answer: D

View Text Solution

82. The number of moles of $KMnO_4$ that will be needed to react with one mole of sulphite ion in acidic solution is :

A. $\frac{4}{5}$

B. $\frac{2}{5}$

C. 1

D. $\frac{3}{5}$

Answer: B

View Text Solution

83. For the reaction between $KMnO_4$ and H_2O_2 the number of electrons transferred per mole of H_2O_2 is :

A. one

B. two

C. three

D. four

Answer: C

View Text Solution

84. Number of moles of $K_2Cr_2O_7$ reduced by one mole of Sn^{2+} is :

A. $1/3$

B. 3

C. $1/6$

D. 6

Answer: A

View Text Solution

85. The formula mass of Mohr's salt is 392. The iron present in it is oxidised by $KMnO_4$ in acid medium. The equivalent mass of Mohr's salt is :

A. 392

B. 31.6

C. 278

D. 156

Answer: A

View Text Solution

86. To neutralise completely 20 mL of 0.1 M aqueous solution of phosphorus acid (H_3PO_3), the volume of 0.1 M aqueous KOH solution required is :

A. 10 mL

B. 20 mL

C. 40 mL

D. 60 mL

Answer: C

View Text Solution

87. $10cm^3$ of 0.1 N monobasic acid requires $15cm^3$ of sodium hydroxide solution whose normality is :

A. 0.066 N

B. 0.66 N

C. 1.5 N

D. 0.15 N

Answer: A

View Text Solution

88. Amount of oxalic acid present in solution can be oxidised by its titration with $KMnO_4$ solution in the presence of H_2SO_4. The titration gives unsatisfactory result when carried out in the presence of HCl, because HCl :

A. oxidises oxalic acid to carbon dioxide and water

B. gets oxidised by oxalic acid to chlorine

C. furnishes H^+ ions in addition to those from oxalic acid

D. reduces permanganate to Mn^{2+}

Answer: D

View Text Solution

89. How many moles of acidified $FeSO_4$ can be completely oxidised by one mole of `KMnO_(4)~ ?

A. 10

B. 5

C. 6

D. 2

Answer: B

View Text Solution

90. In the titration of nitric acid against potassium carbonate, the indicator used is :

A. methyl orange

B. self indicator

C. phenolphthalein

D. diphenylamine

Answer: C

View Text Solution

91. In transforming 0.01 mole of PbS to $PbSO_4$, the volume of 10 volume H_2O_2 required will be :

A. 11.2 mL

B. 22.4 mL

C. 33.6 mL

D. 44.8 mL

Answer: D

View Text Solution

92. A solution containing Na_2CO_3 and NaOH requires 300 mL of 0.1 N HCl using phenolphthalein as an indicator. Methyl orange is then added to above titrated solution when a further 25 mL of 0.2 N HCl is required. The amount of NaOH present in the original solution is :

A. 0.5 g

B. 1 g

C. 2 g

D. 4 g

Answer: B

View Text Solution

93. Ceric ammonium sulphate and potassium permanganate are used as oxidising agents in acidic medium for oxidation of ferrous ammonium sulphate to ferric sulphate. The ratio of number of moles of ceric ammonium sulphate required per mole of ferrous ammonium sulphate to the number of moles of $KMnO_4$ required per mole of ferrous ammonium sulphate is :

A. 5.0

B. 0.2

C. 0.6

D. 2.0

Answer: A

View Text Solution

94. One kilogram of sea water contains 6 mg of dissolved O_2. The concentration of O_2 in the sample in ppm is :

A. 0.6

B. 6.0

C. 60.0

D. 2.0

Answer: B

View Text Solution

95. The estimation of available chlorine in bleaching powder is done by :

A. Acid-base titration

B. Permanganometric titration

C. Iodimetric titration

D. Iodometric titration

Answer: D

View Text Solution

96. What volume of $0.1MH_2SO_4$ is required in litres to neutralize completely 1 litre of a solution containing 20 g of NaOH ?

A. 5.0

B. 0.5

C. 2.5

D. 10.0

Answer: C

View Text Solution

97. The normality of 10 volume H_2O_2 is :

A. 0.176

B. 0.88

C. 1.78

D. 3.52

Answer: C

View Text Solution

98. In volumetric experiment, it was found that a solution of $KMnO_4$ is reduced to $MnSO_4$. If the normality of solution is 1 N, then molarity of solution will be :

A. 0.5 M

B. 0.2 M

C. 1 M

D. 0.4 M

Answer: B

View Text Solution

99. 0.222 g of iron ore was brought into solution, Fe^{3+} is reduced to Fe^{2+} with $SnCl_2$. The reduced solution required 20 mL of $0.1NKMnO_4$ solution. The percentage of iron present in the ore is (equivalent weight of iron is 55.5) :

A. $55.5\ \%$

B. $45.0\ \%$

C. $50.0\ \%$

D. $40.0\ \%$

Answer: C

View Text Solution

Objective Question Level B

1. The value of n in the equation,

$Cr_2O_7^{2-} + 14H^+ + \neq^- \rightarrow 2Cr^{3+} + 7H_2O$ is :

A. 2

B. 3

C. 4

D. 6

Answer: D

View Text Solution

2. The number of moles of acidified $KMnO_4$ required to oxidise one mole of ferrous oxalate (FeC_2O_4) is :

A. 5

B. 3

C. 0.6

D. 1.5

Answer: C

View Text Solution

3. A solution contains Na_2CO_3 and $NaHCO_3$. 10 mL of the solution required 2.5 mL of $0.1MH_2SO_4$ for neutralisation using phenophthalein as indicator. Methyl orange is then added when a further 2.5 mL of $0.2MH_2SO_4$ was required . Then the amount of Na_2CO_3 and $NaHCO_3$ in 1 litre of the solution is :

A. 5.3 g and 4.2 g

B. 3.3 g and 6.2 g

C. 4.2 g and 5.3 g

D. 6.2 g and 3.3 g

Answer: A

View Text Solution

4. V_1 mL of NaOH of normality x and V_2 mL of $Ba(OH)_2$ of normality y are together sufficient to neutralize exactly 100 mL of 0.1 N HCl. If $V_1 : V_2 = 1 : 4$ and if x : y =4 : 1, what fraction of the acid is neutralised by $Ba(OH)_2$?

A. 0.5

B. 0.33

C. 0.67

D. 0.25

Answer: A

View Text Solution

5. A 0.518 g sample of limestone is dissolved in HCl and then the calcium is precipitated as $Ca_2C_2O_4$. After filtering and washing the precipitate, it requires 40 mL of 0.25 N $KMnO_4$ solution acidified with H_2SO_4 to titrate it as,

$$MnO_4^- + H^+ + C_2O_4^{2-} \rightarrow CO_2 + Mn^{2+} + 2H_2O$$

The percentage of CaO in the sample is :

A. 0.54

B. $27.1\ \%$

C. 0.42

D. 0.84

Answer: A

View Text Solution

6. When 40 mL of 0.1 N HCl and 20 mL of $0.1MH_2SO_4$ are mixed together, the normality of the mixture will be :

A. $\frac{1}{5}N$

B. $\frac{2}{15}N$

C. $\frac{15}{2}N$

D. $\frac{5}{1}N$

Answer: B

View Text Solution

7. What is the normality of $0.3MH_3PO_4$ when it undergoes the reaction as ?

$H_3PO_4 + 2OH^- \rightarrow HPO_3^{2-} + 2H_2O$

A. 0.3 N

B. 0.15 N

C. 0.60 N

D. 0.90 N

Answer: C

View Text Solution

8. In the mixture of $(NaHCO_3 + Na_2CO_3)$, volume of HCl required is x mL with phenolphthalein indicator and y mL with mthyl orange inidicator in same titration. Hence, volume of HCl for complete reaction of Na_2CO_3 is :

A. 2 x

B. y

C. $x/2$

D. $(y-x)$

Answer: A

View Text Solution

9. 40 mL of $0.05M Na_2CO_3.NaHCO_3.2H_2O$ (sesquicarbonate) is titrated against 0.05 M HCl. X and of HCl is used when phenolphthalein is the indicator in two separate titrations , hence (y-x) is :

A. 80 mL

B. 30 mL

C. 120 mL

D. none of these

Answer: A

View Text Solution

10. Equivalent mass of H_3PO_2 when it disproportionates into PH_3 and H_3PO_3 is (Molecular mass=M) :

A. M

B. $\frac{M}{2}$

C. $\frac{M}{4}$

D. $\frac{3M}{4}$

Answer: D

View Text Solution

11. The reagent commonly used to determine harness of water titrimetrically is :

A. Oxalic acid

B. disodium salt EDTA

C. sodium citrate

D. sodium thiosulphate

Answer: B

View Text Solution

12. The equivalent mass of sodium thiosulphate $(Na_2S_2O_3.5H_2O)$ in the reaction,

$2Na_2S_2O_3 + I_2 \rightarrow 2NaI + Na_2S_4O_6$ is :

A. 248

B. 124

C. 596

D. 62

Answer: A

View Text Solution

13. If 100 mL of the acid is neutralised by 100 mL of 4 M NaOH, the purity of concentrated HCl (sp. Gravity =1.2) is :

A. 0.12

B. 0.98

C. 0.73

D. 0.43

Answer: A

View Text Solution

14. 2 moles of $FeSO_4$ are oxidised by x moles of $KMnO_4$ in acid medium into ferric sulphate. 3 moles of ferric oxalate are oxidised by y moles of $K_2Cr_2O_7$ in acid medium. The value of (x/y) is :

A. $6/5$

B. $2/15$

C. $18/5$

D. $3/5$

Answer: B

View Text Solution

15. What volume of $0.05MCr_2O_7^{2-}$ in acid medium is needed for complete oxidation of 200 mL of $0.6MFeC_2O_4$ solution ?

A. 0.6 L

B. 1.2 L

C. 2.4 L

D. 3.6 L

Answer: B

View Text Solution

16. $KMnO_4$ reacts with oxalic acid according to the reaction :

$2KMnO_4 + 5C_2O_4^{2-} + 16H^+ \rightarrow 2Mn^{2+} + 10CO_2 + 7H_2O$

Then, 20 mL of 0.1M $KMnO_4$ is equivalent to :

A. 30 mL of 0.5 M $C_2H_2O_4$ (oxalic acid)

B. 50 mL of 0.1 M$C_2H_2O_4$ (oxalic acid)

C. 20 mL of $0.5MC_2H_2O_4$ (oxalic acid)

D. 10 mL of $0.1MC_2H_2O_4$ (oxalic acid)

Answer: B

View Text Solution

17. Potassium permanganate is titrated against ferrous ammonium sulphate in acidic medium, the equivalent mass of potassium

permanganate is :

A. $\frac{\text{molecular mass}}{3}$

B. $\frac{\text{molecular mass}}{5}$

C. $\frac{\text{molecular mass}}{2}$

D. $\frac{\text{molecular mass}}{10}$

Answer: B

View Text Solution

18. Number of moles of $K_2Cr_2O_7$ that can be reduced by 1 mole of Sn^{2+} ions is :

A. $1/3$

B. $3/2$

C. $5/6$

D. $6/5$

Answer: A

View Text Solution

19. Potassium permanganate acts as an oxidising agent in acidic, alkaline as well as neutral media. Which among the following statements is incorrect ?

A. $N = M/5$ (in acid medium)

B. $N = M/3$ (in alkaline medium)

C. $N = M/3$ (in neutral medium)

D. $N = M$ (in alkaline medium)

Answer: B

View Text Solution

20. The number of equivalents of $Na_2S_2O_3$ required for the volumetric estimation of one equivalent of Cu^{2+} is :

A. $1/3$

B. 1

C. $3/2$

D. $2/3$

Answer: B

View Text Solution

21. The equivalent mass of $MnSO_4$ becomes half of its molecular mass when it is converted into :

A. MnO_4^-

B. MnO_2 or Mn_3O_4

C. MnO_4^-

D. $Mn_2O_4^{2-}$

Answer: B

View Text Solution

22. A solution of 10 mL of $\frac{M}{10}FeSO_4$ was titrated with $KMnO_4$ solution in acidic medium, the amount of $KMnO_4$ used will be :

A. 10 mL of 0.5 M

B. 10 mL of 0.1 M

C. 10 mL of 0.02 M

D. 5 mL of 0.1 M

Answer: C

View Text Solution

23. Among the following reactions, used in titrations, select the reaction (s) in which the chlorine is oxidised :

1. $MnO_2 + 4HCl \rightarrow MnCl_2 + Cl_2 + 2H_2O$

2. $2KI + Cl_2 \rightarrow 2KCl + I_2$

3. $CaOCl_2 + H_2O \rightarrow Ca(OH)_2 + Cl_2$

4. $CrO_2Cl_2 + 2NaOH \rightarrow Na_2CrO_4 + 2HCl$

A. reaction 2, 3 and 4

B. reaction 1 only

C. reaction 1 and 3

D. reaction 4 only

Answer: C

View Text Solution

24. Oxalic acid dihydrate, $H_2C_2O_4.2H_2O(s)$ is often used as a primary reagent to standardise sodium hydroxide solution. Which of these facts are reasons to choose this substance as a primary standard ?

I. It is diprotic.

II. It is a stable compound that can be weighed directly in air.

III. It is available in pure form.

A. III only

B. I and II only

C. II and III only

D. I, II and III

Answer: C

View Text Solution

25. A 20 mL sample of a $Ba(OH)_2$ solution is titrated with 0.245 M HCl. If 27.15 mL of HCl is required, what is the molarity of the $Ba(OH)_2$ solution ?

A. 0.166 M

B. 0.180 M

C. 0.333 M

D. 0.666 M

Answer: A

View Text Solution

26. A solution of which substance can best be used as both titrant and its own indicator in an oxidation-reduction titration ?

A. I_2

B. NaOCl

C. $K_2Cr_2O_7$

D. $KMnO_4$

Answer: D

View Text Solution

27. A 0.2 g sample of benzoic acid, C_6H_5COOH, is titrated with a $0.120MBa(OH)_2$ solution. What volume of the $Ba(OH)_2$ solution is required to reach the equivalence point ?

$\frac{\text{Substance}}{C_6H_5COOH}$	$\frac{\text{Molar mass}}{122.1g\ \ \text{mol}^{-1}}$

A. 6.82 mL

B. 13.6 mL

C. 17.6 mL

D. 35.2 mL

Answer: A

View Text Solution

28. What mass of magnesium hydroxide is required to neutralise 125 mL of 0.136 M HCl solution ?

Substance	Molar mass
$Mg(OH)_2$	$58.33 \ \text{g mol}^{-1}$

A. 0.248 g

B. 0.496 g

C. 0.992 g

D. 1.98 g

Answer: B

View Text Solution

29. In the titration of $K_2Cr_2O_7$ and $FeSO_4$, the following data is obtained : V_1mL of $1M_1K_2Cr_2O_7$ requires V_2mL of $1M_2FeSO_4$.

Which of the following relations is true for the above titration ?

A. $6M_1V_1 = M_2V_2$

B. $M_1V_1 = 6M_2V_2$

C. $M_1V_1 = M_2V_2$

D. $3M_1V_1 = 4M_2V_2$

Answer: A

View Text Solution

30. When 20 mL of $\frac{M}{10}$ NaOH are added to 10 mL of $\frac{M}{10}HCl$, the resulting solution will :

A. turn blue litmus red

B. turn phenolphthalein solution pink

C. turn methyl orange red

D. have no effect on either red or blue litmus

Answer: B

View Text Solution

31. A sample of coconut oil weighing 1.5763 g is mixed with 25 mL of 0.4210 M KOH. Some KOH is used in saponification of coconut oil. After the saponification is complete, 8.46 mL of $0.2732MH_2SO_4$ is required to neutralize excess KOH. The saponification number of peanut oil is :

A. 209.6

B. 98.9

C. 108.9

D. 218.9

Answer: A

View Text Solution

32. 12.5 mL of a solution containing 6 g of a dibasic acid in one litre was found to be neutralized by 10 mL of a decinormal solution of NaOH. The molecular mass of the acid is :

A. 110

B. 75

C. 120

D. 150

Answer: D

View Text Solution

33. 20 mL of $0.1MH_3BO_3$ solution on complete neutralisation requires x mL of 0.05 M NaOH solution. The value of x will be :

A. 20 mL

B. 40 mL

C. 120 mL

D. 80 mL

Answer: B

View Text Solution

34. The ammonia evolved from the treatment of 0.30 g of an organic compound for the estimation of nitrogen was passed in 100 mL of 0.1 M sulphuric acid. The excess of acid required 20 mL of 0.5 M sodium hydroxide solution for complete neutralization. The organic compound is :

A. acetamide

B. benzamide

C. urea

D. thiourea

Answer: C

View Text Solution

35. A solution contains Na_2CO_3 and $NaHCO_3$, 10 mL of this solution required 2.5 mL of $0.1MH_2SO_4$ for neutralisation using phenolphthalein indicator. Methyl orange is added after first end point, further titration required 2.5 mL of 0.2 M H_2SO_4. The amount of Na_2CO_3 and $NaHCO_3$ in 1 litre of the solution is :

A. 5.3 g and 4.2 g

B. 3.3 g and 6.2 g

C. 4.2 g and 5.3 g

D. 6.2 g and 3.3 g

Answer: A

View Text Solution

36. MnO_4^- ions are reduced in acidic condition to Mn^{2+} ions whereas they are reduced in neutral condition to MnO_2. The oxidation of 25 mL of a solution X containing Fe^{2+} ions required in acidic condition, 20 mL of a solution Y containing MnO_4^- ions. What volume of solution Y would be required to oxidise 25 mL of solution X containing Fe^{2+} ions in neutral condition ?

A. 11.4 mL

B. 12 mL

C. 33.3 mL

D. 35 mL

Answer: C

View Text Solution

37. 100 mL each of $1NH_2O_2$ and $11.2VH_2O_2$ solution are mixed, then the resultant solution will be :

A. $3MH_2O_2$

B. $0.5NH_2O_2$

C. $25.5g/LH_2O_2$

D. $2.55g/LH_2O_2$

Answer: C

View Text Solution

38. $0.1gKIO_3$ and excess KI when treated with HCl, the iodine is liberated. The liberated iodine required 45 mL solution thiosulphate for titration . The molarity of sodium thisoulphate will be equivalent to :

A. 0.252 M

B. 0.126 M

C. 0.0313 M

D. 0.0623 M

Answer: D

View Text Solution

Assertion Reason Type Questions

1. Assertion : H_3PO_3 is a dibasic acid.

Reason : Two H-atoms are directly attached to phosphorus 'P'.

A. If both Assertion and Reason are correct, and Reason is the correct explanation of Assertion.

B. If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion.

C. If Assertion is correct, but Reason is incorrect.

D. If Assertion is incorrect, but Reason is correct.

Answer: C

View Text Solution

2. Assertion : Equivalent mass of $KMnO_4$ is equal to one-fifth of its molecular mass when it acts as an oxidising agent in acidic medium.

Reason : Oxidation number of Mn in $KMnO_4$ is $+7$.

A. If both Assertion and Reason are correct, and Reason is the correct explanation of Assertion.

B. If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion.

C. If Assertion is correct, but Reason is incorrect.

D. If Assertion is incorrect, but Reason is correct.

Answer: B

View Text Solution

3. Assertion : 5 M HCl solution is diluted 10 times, its molarity becomes 50.

Reason : On dilution, molarity of the solution decreases.

A. If both Assertion and Reason are correct, and Reason is the correct explanation of Assertion.

B. If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion.

C. If Assertion is correct, but Reason is incorrect.

D. If Assertion is incorrect, but Reason is correct.

Answer: D

View Text Solution

4. Assertion : In the reactin, $2S_2O_3^{2-} + I_2 \rightarrow S_4O_6^{2-} + 2I^- : I_2$ is oxidised.

Reason : During oxidation, loss of electron takes place.

A. If both Assertion and Reason are correct, and Reason is the correct explanation of Assertion.

B. If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion.

C. If Assertion is correct, but Reason is incorrect.

D. If Assertion is incorrect, but Reason is correct.

Answer: D

Watch Video Solution

5. Assertion : In the titration of HCl against NaOH, phenolphthalein is used as suitable indicator.

Reason : Phenolphthalein is pink coloured in basic medium.

A. If both Assertion and Reason are correct, and Reason is the correct explanation of Assertion.

B. If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion.

C. If Assertion is correct, but Reason is incorrect.

D. If Assertion is incorrect, but Reason is correct.

Answer: B

View Text Solution

6. Assertion : Concentration of H_2O_2 is expressed in volume.

Reason : Volume strength of H_2O_2 = Normality $\times$ 5.6.

A. If both Assertion and Reason are correct, and Reason is the correct explanation of Assertion.

B. If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion.

C. If Assertion is correct, but Reason is incorrect.

D. If Assertion is incorrect, but Reason is correct.

Answer: B

View Text Solution

7. Assertion : Iodimetric titrations are redox titrations.

Reason : The iodine solution acts as an oxidising agent.

A. If both Assertion and Reason are correct, and Reason is the correct explanation of Assertion.

B. If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion.

C. If Assertion is correct, but Reason is incorrect.

D. If Assertion is incorrect, but Reason is correct.

Answer: A

View Text Solution

8. Assertion : Starch is used as absorption indicator in iodometric and iodimetric titrations.

Reason : Starch forms iodostarch complex with iodine, which is blue coloured.

A. If both Assertion and Reason are correct, and Reason is the correct explanation of Assertion.

B. If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion.

C. If Assertion is correct, but Reason is incorrect.

D. If Assertion is incorrect, but Reason is correct.

Answer: A

View Text Solution

9. Assertion : H_3BO_3 is monobasic Lewis acid but its salt Na_3BO_3 exists.

Reason : H_3BO_3 reacts with NaOH to give Na_3BO_3.

A. If both Assertion and Reason are correct, and Reason is the correct explanation of Assertion.

B. If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion.

C. If Assertion is correct, but Reason is incorrect.

D. If Assertion is incorrect, but Reason is correct.

Answer: C

View Text Solution

10. Assertion : Equivalent weight of a base $= \frac{\text{Molecular weight}}{\text{Acidity}}$

Reason : Acidity is the number of replaceable hydrogen atoms in one molecule of the base.

A. If both Assertion and Reason are correct, and Reason is the correct explanation of Assertion.

B. If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion.

C. If Assertion is correct, but Reason is incorrect.

D. If Assertion is incorrect, but Reason is correct.

Answer: C

Watch Video Solution

Integer Answer Type Questions

1. The volume (in mL) of 0.1 $MAgNO_3$ required to completely precipitat the chloride ions present in 30 mL of 0.01 M of $\left[Cr(H_2O)_5Cl\right]Cl_2$, as silver chloride is close to :

View Text Solution

2. Volume strength of H_2O_2 is 5.6, its normality will be :

Watch Video Solution

3. Inneutral or faintly alkaline solution, 8 moles of permanganate anion quantitatively oxidize thiosulphate anions to produce X moles of a sulphur containing product. The magnitude of X is :

View Text Solution

Passage 1

1. Pyrolusite, MnO_2, is the main ore from which manganese is produced. The manganese content of the ore may be determined by reducing the MnO_2 under acetic conditions to Mn^{2+} with the oxalate ion, $C_2O_4^{2-}$, the oxalate ion being oxidised to carbon dioxide during the reaction. The analytical determination is carried out by adding a known excess volume of oxalate solution to a suspension of the pyrolusite and digesting the mixture on a hot water bath until all the MnO_2 has been reduced. The excess, unreacted oxalate solution is then titrated with standardised potassium permanganate, $KMnO_4$ solution after which the manganese content of the ore can be calculated.

A student prepared a standard solution of sodium oxalate by weighing 3.2 g of the dry anhydrous salt, dissolving it in distilled water and making the solution up to 500 mL. 25 mL of the oxalate solution required 24.76 mL of $KMnO_4$ solution.

What is the equivalent mass of MnO_2 in the present titration ?

A. $\frac{M.\,w.}{1}$

B. $\frac{M.w.}{2}$

C. $\frac{M.w.}{3}$

D. $\frac{2M.w.}{3}$

Answer: B

View Text Solution

2. Pyrolusite, MnO_2, is the main ore from which manganese is produced. The manganese content of the ore may be determined by reducing the MnO_2 under acetic conditions to Mn^{2+} with the oxalate ion, $C_2O_4^{2-}$, the oxalate ion being oxidised to carbon dioxide during the reaction. The analytical determination is carried out by adding a known excess volume of oxalate solution to a suspension of the pyrolusite and digesting the mixture on a hot water bath until all the MnO_2 has been reduced. The excess, unreacted oxalate solution is then titrated with standardised potassium permanganate, $KMnO_4$ solution after which the manganese content of the ore can be

calculated.

A student prepared a standard solution of sodium oxalate by weighing 3.2 g of the dry anhydrous salt, dissolving it in distilled water and making the solution up to 500 mL. 25 mL of the oxalate solution required 24.76 mL of $KMnO_4$ solution.

How many moles of $C_2O_4^{2-}$ ions will be oxidised by 1 mole MnO_4^- ?

A. $1/2$

B. $3/2$

C. $5/2$

D. $7/2$

Answer: C

View Text Solution

3. Pyrolusite, MnO_2, is the main ore from which manganese is produced. The manganese content of the ore may be determined by

reducing the MnO_2 under acetic conditions to Mn^{2+} with the oxalate ion, $C_2O_4^{2-}$, the oxalate ion being oxidised to carbon dioxide during the reaction. The analytical determination is carried out by adding a known excess volume of oxalate solution to a suspension of the pyrolusite and digesting the mixture on a hot water bath until all the MnO_2 has been reduced. The excess, unreacted oxalate solution is then titrated with standardised potassium permanganate, $KMnO_4$ solution after which the manganese content of the ore can be calculated.

A student prepared a standard solution of sodium oxalate by weighing 3.2 g of the dry anhydrous salt, dissolving it in distilled water and making the solution up to 500 mL. 25 mL of the oxalate solution required 24.76 mL of $KMnO_4$ solution.

Molarity of the sodium oxalate solution is ..

A. 0.04776

B. 0.07446

C. 0.06447

D. 0.07644

Answer: A

View Text Solution

4. Pyrolusite, MnO_2, is the main ore from which manganese is produced. The manganese content of the ore may be determined by reducing the MnO_2 under acetic conditions to Mn^{2+} with the oxalate ion, $C_2O_4^{2-}$, the oxalate ion being oxidised to carbon dioxide during the reaction. The analytical determination is carried out by adding a known excess volume of oxalate solution to a suspension of the pyrolusite and digesting the mixture on a hot water bath until all the MnO_2 has been reduced. The excess, unreacted oxalate solution is then titrated with standardised potassium permanganate, $KMnO_4$ solution after which the manganese content of the ore can be calculated.

A student prepared a standard solution of sodium oxalate by weighing

3.2 g of the dry anhydrous salt, dissolving it in distilled water and making the solution up to 500 mL. 25 mL of the oxalate solution required 24.76 mL of $KMnO_4$ solution.

What is the molarity of $KMnO_4$ solution ?

A. 0.04776

B. 0.01929

C. 0.038

D. 0.028

Answer: B

View Text Solution

5. Pyrolusite, MnO_2, is the main ore from which manganese is produced. The manganese content of the ore may be determined by reducing the MnO_2 under acetic conditions to Mn^{2+} with the oxalate ion, $C_2O_4^{2-}$, the oxalate ion being oxidised to carbon dioxide during

the reaction. The analytical determination is carried out by adding a known excess volume of oxalate solution to a suspension of the pyrolusite and digesting the mixture on a hot water bath until all the MnO_2 has been reduced. The excess, unreacted oxalate solution is then titrated with standardised potassium permanganate, $KMnO_4$ solution after which the manganese content of the ore can be calculated.

A student prepared a standard solution of sodium oxalate by weighing 3.2 g of the dry anhydrous salt, dissolving it in distilled water and making the solution up to 500 mL. 25 mL of the oxalate solution required 24.76 mL of $KMnO_4$ solution.

Role of $KMnO_4$ in the given titration can be described as :

A. oxidising agent

B. reducing agent

C. indicator

D. oxidising agent and indicator

Answer: D

View Text Solution

Passage 2

1. For a series of indicators the following colours and pH range over which colour change takes place are as follows :

Indicator	Colour change over pH range	
U	yellow to blue	(pH 0 to 1.6)
V	red to yellow	(pH 2.8 to 4.4)
W	red to yellow	(pH 4.2 to 5.8)
X	yellow to blue	(pH 6.0 to 7.7)
Y	colourless to red	(pH 8.2 to 10)

Indicator V could be used to find the equivalence point for 0.1 M acetic acid and 0.1 M ammonium hydroxide solution :

(a) True

(b) False

View Text Solution

2. For a series of indicators the following colours and pH range over which colour change takes place are as follows :

Indicator	Colour change over pH range	
U	*yellow to blue*	*(pH 0 to 1.6)*
V	*red to yellow*	*(pH 2.8 to 4.1)*
W	*red to yellow*	*(pH 4.2 to 5.8)*
X	*yellow to blue*	*(pH 6.0 to 7.7)*
Y	*colourless to red*	*(pH 8.2 to 10)*

Indicator Y could be used to distinguish between the solutions of ammonium chloride and sodium acetate solution :

(a) True

(b) False

View Text Solution

3. For a series of indicators the following colours and pH range over which colour change takes place are as follows :

Indicator	Colour change over pH range	
U	*yellow to blue*	*(pH 0 to 1.6)*
V	*red to yellow*	*(pH 2.8 to 4.1)*
W	*red to yellow*	*(pH 4.2 to 5.8)*
X	*yellow to blue*	*(pH 6.0 to 7.7)*
Y	*colourless to red*	*(pH 8.2 to 10)*

Indicator X could be used to distinguish between the solution of ammonium chloride and sodium acetate solution :

(a) True

(b) False

View Text Solution

4. For a series of indicators the following colours and pH range over which colour change takes place are as follows :

Indicator	Colour change over pH range	
U	yellow to blue	(pH 0 to 1.6)
V	red to yellow	(pH 2.8 to 4.4)
W	red to yellow	(pH 4.2 to 5.8)
X	yellow to blue	(pH 6.0 to 7.7)
Y	colourless to red	(pH 8.2 to 10)

Indicator W would be suitable for use in the determination of the concentration of acetic acid in white vinegar by base titration :

(a) True

(b) False

View Text Solution

5. For a series of indicators the following colours and pH range over which colour change takes place are as follows :

Indicator	Colour change over pH range	
U	yellow to blue	(pH 0 to 1.6)
V	red to yellow	(pH 2.8 to 4.1)
W	red to yellow	(pH 4.2 to 5.8)
X	yellow to blue	(pH 6.0 to 7.7)
Y	colourless to red	(pH 8.2 to 10)

Indicator U could be used to distinguish between 0.1 M and 0.01 M solution of sulphuric acid :

(a) True

(b) False

View Text Solution

Passage 3

1. Chemists work with standardised solution, a solution whose concentration is known. The requirements to standardise the solution are :

1. the volume of the solution.

2. the number of moles of solute in that volume.

A primary standard solution is used in determining the molarity of a solution. To find the molarity of HCl, 0.317 g of Na_2CO_3, the primary standard dissolved in water, is used in titrating the solution of HCl. 22.9 mL of acid are required to neutralise the sodium carbonate. This is the needed volume (first requirement). The stoichiometric equation is used to know the second requirement.

$2HCl(aq.) + Na_2CO_3(aq.) \rightarrow 2NaCl + H_2O + CO_2 \uparrow$

What is the molarity of HCl in the above case ?

A. 0.261 M

B. 0.522 M

C. 0.1 M

D. 1 M

Answer: A

View Text Solution

2. Chemists work with standardised solution, a solution whose concentration is known. The requirements to standardise the solution are :

1. the volume of the solution.

2. the number of moles of solute in that volume.

A primary standard solution is used in determining the molarity of a solution. To find the molarity of HCl, 0.317 g of Na_2CO_3, the primary standard dissolved in water, is used in titrating the solution of HCl. 22.9 mL of acid are required to neutralise the sodium carbonate. This is the needed volume (first requirement). The stoichiometric equation is used to know the second requirement.

$2HCl(aq.) + Na_2CO_3(aq.) \rightarrow 2NaCl + H_2O + CO_2 \uparrow$

Equivalent mass of Na_2CO_3 in the above equation will be :

A. 106

B. 53

C. 26.5

D. 13.25

Answer: B

View Text Solution

3. Chemists work with standardised solution, a solution whose concentration is known. The requirements to standardise the solution are :

1. the volume of the solution.

2. the number of moles of solute in that volume.

A primary standard solution is used in determining the molarity of a solution. To find the molarity of HCl, 0.317 g of Na_2CO_3, the primary standard dissolved in water, is used in titrating the solution of HCl. 22.9 mL of acid are required to neutralise the sodium carbonate. This is the needed volume (first requirement). The stoichiometric equation is used to know the second requirement.

$2HCl(aq.) + Na_2CO_3(aq.) \rightarrow 2NaCl + H_2O + CO_2 \uparrow$

The suitable indicator in the above titration will be :

A. phenolphthalein

B. methyl orange

C. litmus

D. bromothymol blue

Answer: B

View Text Solution

4. Chemists work with standardised solution, a solution whose concentration is known. The requirements to standardise the solution are :

1. the volume of the solution.

2. the number of moles of solute in that volume.

A primary standard solution is used in determining the molarity of a solution. To find the molarity of HCl, 0.317 g of Na_2CO_3, the primary standard dissolved in water, is used in titrating the solution of HCl. 22.9 mL of acid are required to neutralise the sodium carbonate. This is the

needed volume (first requirement). The stoichiometric equation is used to know the second requirement.

$2HCl(aq.) + Na_2CO_3(aq.) \rightarrow 2NaCl + H_2O + CO_2 \uparrow$

Solution of Na_2CO_3 in water will be :

A. acidic

B. neutral

C. basic

D. Cannot be predicted

Answer: C

View Text Solution

5. Chemists work with standardised solution, a solution whose concentration is known. The requirements to standardise the solution are :

1. the volume of the solution.

2. the number of moles of solute in that volume.

A primary standard solution is used in determining the molarity of a solution. To find the molarity of HCl, 0.317 g of Na_2CO_3, the primary standard dissolved in water, is used in titrating the solution of HCl. 22.9 mL of acid are required to neutralise the sodium carbonate. This is the needed volume (first requirement). The stoichiometric equation is used to know the second requirement.

$2HCl(aq.) + Na_2CO_3(aq.) \rightarrow 2NaCl + H_2O + CO_2 \uparrow$

What fraction of na_2CO_3 will be neutralised by HCl in presence of phenolphthalein indicator ?

A. $1/3$

B. $2/3$

C. $1/2$

D. $1/4$

Answer: C

View Text Solution

Passage 4

1. 0.5 g bleaching powder was suspended in water and excess KI is added. On acidifying with dil. H_2SO_4, I_2 was liberated which required 50 mL of $N/10$ hypo $(Na_2S_2O_3.5H_2O)$ in presence of starch. The reactions involved are :

I. $CaOCl_2 + H_2SO_4 \rightarrow CaSO_4 \rightarrow CaSO_4 + H_2O + Cl_2$

II. $2KI + Cl_2 \rightarrow 2KCl + I_2$

III. $2Na_2S_2O_3 + I_2 \rightarrow Na_2S_4O_6 + 2NaI$

In the reaction (I), which one is reduced ?

A. $CaOCl_2$

B. H_2SO_4

C. Both

D. none of these

Answer: D

View Text Solution

2. 0.5 g bleaching powder was suspended in water and excess KI is added. On acidifying with dil. H_2SO_4, I_2 was liberated which required 50 mL of $N/10$ hypo $(Na_2S_2O_3.5H_2O)$ in presence of starch. The reactions involved are :

I. $CaOCl_2 + H_2SO_4 \rightarrow CaSO_4 \rightarrow CaSO_4 + H_2O + Cl_2$

II. $2KI + Cl_2 \rightarrow 2KCl + I_2$

III. $2Na_2S_2O_3 + I_2 \rightarrow Na_2S_4O_6 + 2NaI$

In the given titration, starch acts as :

A. oxidising agent

B. indicator

C. reducing agent

D. catalyst

Answer: B

View Text Solution

3. 0.5 g bleaching powder was suspended in water and excess KI is added. On acidifying with dil. H_2SO_4, I_2 was liberated which required 50 mL of $N/10$ hypo $(Na_2S_2O_3.5H_2O)$ in presence of starch. The reactions involved are :

I. $CaOCl_2 + H_2SO_4 \rightarrow CaSO_4 \rightarrow CaSO_4 + H_2O + Cl_2$

II. $2KI + Cl_2 \rightarrow 2KCl + I_2$

III. $2Na_2S_2O_3 + I_2 \rightarrow Na_2S_4O_6 + 2NaI$

In reaction (II), Cl_2 acts as :

A. reducing agent

B. oxidising agent

C. indicator

D. both oxidising agent and indicator

Answer: B

View Text Solution

4. 0.5 g bleaching powder was suspended in water and excess KI is added. On acidifying with dil. H_2SO_4, I_2 was liberated which required 50 mL of $N/10$ hypo $(Na_2S_2O_3.5H_2O)$ in presence of starch. The reactions involved are :

I. $CaOCl_2 + H_2SO_4 \rightarrow CaSO_4 \rightarrow CaSO_4 + H_2O + Cl_2$

II. $2KI + Cl_2 \rightarrow 2KCl + I_2$

III. $2Na_2S_2O_3 + I_2 \rightarrow Na_2S_4O_6 + 2NaI$

Percentage of available chlorine in bleaching powder is :

A. $35.5\ \%$

B. $71\ \%$

C. $17.25\ \%$

D. $50\ \%$

Answer: A

View Text Solution

5. 0.5 g bleaching powder was suspended in water and excess KI is added. On acidifying with dil. H_2SO_4, I_2 was liberated which required 50 mL of $N/10$ hypo $(Na_2S_2O_3.5H_2O)$ in presence of starch. The reactions involved are :

I. $CaOCl_2 + H_2SO_4 \rightarrow CaSO_4 \rightarrow CaSO_4 + H_2O + Cl_2$

II. $2KI + Cl_2 \rightarrow 2KCl + I_2$

III. $2Na_2S_2O_3 + I_2 \rightarrow Na_2S_4O_6 + 2NaI$

Starch forms iodo-starch complex in the given titration. The colour of the complex will be :

A. green

B. blue

C. pale yellow

D. milky white

Answer: B

View Text Solution

Passage 5

1. Hypo is the common name of sodium thiosulphate, with molecular formula $Na_2S_2O_3$. It is used as intermediate in iodometric as well as in iodimetric titrations.

Iodine and chlorine react with hypo in different ways as follows :

$2na_2S_2O_3 + I_2 \rightarrow 2NaI + Na_2S_4O_6$

$Cl_2(g) + S_2O_3^{2-} \rightarrow SO_4^{2-} + Cl^- + S$

Suppose, 50 mL of $0.01M Na_2S_2O_3$ solution and 5×10^{-4} mol of Cl_2 are allowed to react according to the above equation. Hypo is also used in photography to dissolve AgBr, forming a complex compound.

$2Na_2S_2O_3 + AgBr \rightarrow Na_3\left[Ag(S_2O_3)_2\right] + NaBr$

The balanced chemical reaction with Cl_2 is :

A. $Cl_2 + 2Na_2S_2O_3 \rightarrow 2NaCl + Na_2S_4O_6$

B. $Cl_2 + H_2O + Na_2S_2O_3 \rightarrow Na_2SO_4 + 2HCl + S$

C. $Cl_2(g) + S_2O_3^{2-} \rightarrow SO_4^{2-} + S + Cl^-$

D. none of the above

Answer: B

View Text Solution

2. Hypo is the common name of sodium thiosulphate, with molecular formula $Na_2S_2O_3$. It is used as intermediate in iodometric as well as in iodimetric titrations.

Iodine and chlorine react with hypo in different ways as follows :

$2na_2S_2O_3 + I_2 \rightarrow 2NaI + Na_2S_4O_6$

$Cl_2(g) + S_2O_3^{2-} \rightarrow SO_4^{2-} + Cl^- + S$

Suppose, 50 mL of $0.01MNa_2S_2O_3$ solution and 5×10^{-4} mol of Cl_2 are allowed to react according to the above equation. Hypo is also used in photography to dissolve AgBr, forming a complex compound.

$2Na_2S_2O_3 + AgBr \rightarrow Na_3\left[Ag(S_2O_3)_2\right] + NaBr$

Number of moles of $S_2O_3^{2-}$ present in the sample is :

A. 0.0005

B. 0.01

C. 0.0025

D. 0.02

Answer: A

View Text Solution

3. Hypo is the common name of sodium thiosulphate, with molecular formula $Na_2S_2O_3$. It is used as intermediate in iodometric as well as in iodimetric titrations.

Iodine and chlorine react with hypo in different ways as follows :

$2na_2S_2O_3 + I_2 \rightarrow 2NaI + Na_2S_4O_6$

$Cl_2(g) + S_2O_3^{2-} \rightarrow SO_4^{2-} + Cl^- + S$

Suppose, 50 mL of $0.01MNa_2S_2O_3$ solution and 5×10^{-4} mol of Cl_2 are allowed to react according to the above equation. Hypo is also used in photography to dissolve AgBr, forming a complex compound.

$2Na_2S_2O_3 + AgBr \rightarrow Na_3\left[Ag(S_2O_3)_2\right] + NaBr$

What is the molarity of Na_2SO_4 formed in the reaction between $Na_2S_2O_3$ and Cl_2 ?

A. 0.08 M

B. 0.04 M

C. 0.02 M

D. 0.01 M

Answer: D

View Text Solution

4. Hypo is the common name of sodium thiosulphate, with molecular formula $Na_2S_2O_3$. It is used as intermediate in iodometric as well as in iodimetric titrations.

Iodine and chlorine react with hypo in different ways as follows :

$2na_2S_2O_3 + I_2 \rightarrow 2NaI + Na_2S_4O_6$

$Cl_2(g) + S_2O_3^{2-} \rightarrow SO_4^{2-} + Cl^- + S$

Suppose, 50 mL of $0.01MNa_2S_2O_3$ solution and 5×10^{-4} mol of Cl_2 are allowed to react according to the above equation. Hypo is also used in photography to dissolve AgBr, forming a complex compound.

$2Na_2S_2O_3 + AgBr \rightarrow Na_3\left[Ag(S_2O_3)_2\right] + NaBr$

The process of photography, in which $Na_2S_2O_3$ is used, is called

A. developing

B. image fixing

C. tonning

D. all of these

Answer: B

View Text Solution

5. Hypo is the common name of sodium thiosulphate, with molecular formula $Na_2S_2O_3$. It is used as intermediate in iodometric as well as in iodimetric titrations.

Iodine and chlorine react with hypo in different ways as follows :

$2na_2S_2O_3 + I_2 \rightarrow 2NaI + Na_2S_4O_6$

$Cl_2(g) + S_2O_3^{2-} \rightarrow SO_4^{2-} + Cl^- + S$

Suppose, 50 mL of $0.01MNa_2S_2O_3$ solution and 5×10^{-4} mol of Cl_2 are allowed to react according to the above equation. Hypo is also used in photography to dissolve AgBr, forming a complex compound.

$2Na_2S_2O_3 + AgBr \rightarrow Na_3\left[Ag(S_2O_3)_2\right] + NaBr$

Oxidation state of silver in $Na_3\left[Ag(S_2O_3)_2\right]$ is :

A. 0

B. $+1$

C. $+2$

D. -1

Answer: B

View Text Solution

Passage 6

1. Equivalent mass of a substance may be calculated as,

Equivalent mass $= \dfrac{\text{Molecular mass}}{\text{n-factor}} = \dfrac{\text{Atomic mass}}{n - fac \rightarrow r}$

n-factor= Basicity of acid or acidity of base

n-factor= Number of moles of electrons gainted or lost per mole of oxidising or reducing agents

n-factor= Total positive or negative valency of a salt

n-factor= Valency of an ion.

Concept of n-factor is very important for redox as well as for non-redox reactions.

When $KMnO_4$ is titrated against ferrous ammonium sulphate in acid medium then equivalent mass of $KMnO_4$ will be :

A. $\dfrac{\text{Molecular mass}}{10}$

B. $\dfrac{\text{molecular mass}}{5}$

C. $\dfrac{\text{Molecular mass}}{3}$

D. $\dfrac{\text{molecular mass}}{2}$

Answer: B

View Text Solution

2. Equivalent mass of a substance may be calculated as,

Equivalent mass $= \frac{\text{Molecular mass}}{\text{n-factor}} = \frac{\text{Atomic mass}}{n - fac \rightarrow r}$

n-factor= Basicity of acid or acidity of base

n-factor= Number of moles of electrons gainted or lost per mole of oxidising or reducing agents

n-factor= Total positive or negative valency of a salt

n-factor= Valency of an ion.

Concept of n-factor is very important for redox as well as for non-redox reactions.

Equivalent mass of ferrous oxalate FeC_2O_4 in the following reaction is :

$FeC_2O_4 \rightarrow Fe^{3+} + 2CO_2$

A. $\frac{\text{Molecular mass}}{1}$

B. $\frac{\text{Molecular mass}}{2}$

C. $\frac{\text{Molecular mass}}{3}$

D. $\frac{\text{Molecular mass}}{4}$

Answer: C

Watch Video Solution

3. Equivalent mass of a substance may be calculated as,

Equivalent mass $= \frac{\text{Molecular mass}}{\text{n-factor}} = \frac{\text{Atomic mass}}{n - fac \to r}$

n-factor= Basicity of acid or acidity of base

n-factor= Number of moles of electrons gainted or lost per mole of oxidising or reducing agents

n-factor= Total positive or negative valency of a salt

n-factor= Valency of an ion.

Concept of n-factor is very important for redox as well as for non-redox reactions.

Equivalent mass of H_3PO_2 when it undergoes disporportionation to PH_3 and H_3PO_3 will be :

A. $M.w./2$

B. $M.w./4$

C. $M.w./24$

D. $3M.w./4$

Answer: D

View Text Solution

4. Equivalent mass of a substance may be calculated as,

Equivalent mass $= \frac{\text{Molecular mass}}{\text{n-factor}} = \frac{\text{Atomic mass}}{n - fac \rightarrow r}$

n-factor= Basicity of acid or acidity of base

n-factor= Number of moles of electrons gainted or lost per mole of oxidising or reducing agents

n-factor= Total positive or negative valency of a salt

n-factor= Valency of an ion.

Concept of n-factor is very important for redox as well as for non-redox reactions.

BrO_3^- ion reacts with Br^- to form Br_2, in acid medium. The equivalent mass of Br_2 in this reaction is :

A. $\frac{4M.\ w.}{6}$

B. $\frac{3M.\ w.}{5}$

C. $\frac{5M.\ w.}{3}$

D. $\frac{5M.\ w.}{8}$

Answer: B

View Text Solution

Passage 7

1. Bleaching powder and bleach solution are produced on a large scale and used in several household products. The effectiveness of bleach solution is often measured by iodometry.

25 mL of household bleach solution was mixed with 30 mL of 0.50 M KI and 10 mL of 4 N acetic acid. In the titration of the liberated iodine, 48 mL of $0.25NNa_2S_2O_3$ was used to reach the end point. The molarity of the household bleach solution is :

A. 0.48 M

B. 0.96 M

C. 0.24 M

D. 0.024 M

Answer: C

View Text Solution

2. Bleaching powder and bleach solution are produced on a large scale and used in several household products. The effectiveness of bleach solution is often measured by iodometry.

Bleaching powder contains a salt of an oxoacid as one of its components. The anhydride of that oxoacid is :

A. Cl_2O

B. Cl_2O_7

C. ClO_2

D. Cl_2O_6

Answer: A

View Text Solution

Section I

1. For decolorisation of 1 mole of $KMnO_4$, the moles of H_2O_2 required is :

A. $\frac{1}{2}$

B. $\frac{3}{2}$

C. $\frac{5}{2}$

D. $\frac{7}{2}$

Answer: C

View Text Solution

2. If equal volume of $1MKMnO_4$ and$1MK_2Cr_2O_7$ solutions are allowed to oxidise Fe^{2+} to Fe^{3+} in acidic medium, then Fe^{2+} will be oxidised :

A. more by $KMnO_4$

B. more by $K_2Cr_2O_7$

C. equal in both cases

D. cannot be determined

Answer: A

View Text Solution

3. MnO_2 on reaction with conc. HCl liberates chlorine, the liberated chlorine ontreatment with aqueous KI gives iodine. The iodine is neutralized by 40 of 0.1 N hypo solution. The reaction is :

$2Na_2S_2O_3 + I_2 \rightarrow 2NaI + Na_2S_4O_6$

The amount of MnO_2 used in the reaction is :

A. 10 g

B. 0.174 g

C. 1.74 g

D. 0.0174 g

Answer: B

View Text Solution

4. 1.520 g of hydroxide of a metal on ignition gave 0.995 g of oxide. The equivalent mass of metal is :

A. 1.52

B. 0.995

C. 190

D. 9

Answer: D

View Text Solution

5. Identify the incorrect statement regarding the volumetric estimation of $FeSO_4$:

A. $KMnO_4$ can be used in aqueous HCl

B. $K_2Cr_2O_7$ can be used in aqueous HCl

C. $KMnO_4$ can be used in aqueous H_2SO_4

D. $K_2Cr_2O_7$ can be used in aqueous H_2SO_4

Answer: A

View Text Solution

6. When one gram mole of $KMnO_4$ is mixed with hydrochlroic acid then, the volume of chlorine gas liberated at NTP will be :

A. 11.2 litre

B. 22.4 litre

C. 56 litre

D. 44.8 litre

Answer: C

Watch Video Solution

7. 0.7 g of $Na_2CO_3.xH_2O$ was dissolved in water to make 100 mL solution, 20 mL of this solution required 19.8 mL of 0.1 N HCl for complete neutralisation. The value of x is :

A. 5

B. 2

C. 3

D. 4

Answer: B

View Text Solution

8. 0.5 g of impure ammonium chloride was heated with caustic soda solution to evolve ammonia gas, the gas is absorbed in 150 mL of

$N/5 H_2SO_4$ solution. Excess sulphuric acid required 20 mL of 1N NaOH for complete neutralization. The percentage of NH_3 in the ammonium chloride is :

A. 0.68

B. 0.34

C. 0.48

D. 0.17

Answer: B

View Text Solution

9. One mole of a mixture of CO and CO_2 requires exactly 20 g of NaOH to convert all the CO_2 into Na_2CO_3. How many more grams of NaOH would it require for conversion into Na_2CO_3 if the mixture (one mole) is completely oxidised to CO_2 ?

A. 60 g

B. 80 g

C. 40 g

D. 20 g

Answer: A

View Text Solution

10. 0.1 litre of $0.01MKMnO_4$ is used by 100 mL of H_2O_2 in acidic medium. Volume of same $KMnO_4$ required in alkaline medium to oxidise 0.1 litre of some H_2O_2 will be :

A. $\frac{100}{3}mL$

B. $\frac{500}{3}mL$

C. $\frac{300}{5}mL$

D. $\frac{400}{3}mL$

Answer: B

View Text Solution

Section Ii

1. One mole of acidic $KMnO_4$ reacts with :

A. $\frac{5}{3}$ mol of FeC_2O_4

B. $\frac{5}{2}$ mol of SO_2

C. 4 mol of FeS

D. 1 mol of H_2SO_4

Answer: A::B

View Text Solution

2. Boric acid (H_3BO_3) is :

A. tribasic

B. dibasic

C. monobasic

D. aprotic

Answer: C::D

View Text Solution

3. 0.6 mol $K_2Cr_2O_7$, in acid medium can oxidise :

A. 3.6 mol $FeSO_4$ to $Fe_2(SO_4)_3$

B. 0.1 mol $FeSO_4$ to $Fe_2(SO_4)_3$

C. 0.05 mol of Sn^{2+} toSn^{4+}

D. 1.8 mol of Sn^{2+} to Sn^{4+}

Answer: A::D

View Text Solution

4. Which of the following statement(s) is/are correct ?

A. H_2SO_4 and H_3PO_3 both are dibasic

B. H_3BO_3 and H_3PO_4 both are tribasic

C. H_3BO_3 and H_3PO_2 both are monobasic

D. HNO_3 and HCl both are monobasic

Answer: A::C::D

View Text Solution

5. In the titration of CH_3COOH against NaOH, we cannot use the :

A. methyl orange

B. methyl red

C. phenolphthalein

D. bromothymol blue

Answer: A::B::D

View Text Solution

Section Iii

1. Statement-1: Equivalent mass of H_3PO_2 is equal to its molecular mass.

Statement-2: H_3PO_2 is a monobasic acid.

A. Statement-1 is true, statement -2 is true, statement-2 is a correct explanation for statement-1.

B. Statement-1 is true, statement-2 is true, statement-2 is not a correct explanation for statement-1.

C. Statement-1 is true, statement-2 is false.

D. Statement-1 is false, statement-2 is true.

Answer: A

View Text Solution

2. Statement-1: When Na_2CO_3 is titrated against HCl in presence of phenolphthalein indicator, it is converted to NaCl.

Statement-2: Phenolphathalein shows colour change in the pH range of

A. Statement-1 is true, statement -2 is true, statement-2 is a correct explanation for statement-1.

B. Statement-1 is true, statement-2 is true, statement-2 is not a correct explanation for statement-1.

C. Statement-1 is true, statement-2 is false.

D. Statement-1 is false, statement-2 is true.

Answer: C

View Text Solution

3. Statement-1 : 1 mol of H_2SO_4 is neutralised by 2 mol of NaOH, however, 1 equivalent of H_2SO_4 is neutralised by 1 equivalent of NaOH. Statement-2: Equivalent mass of H_2SO_4 is half of its moelcular mass, however, the equivalent mass of NaOH is equal to its moelcular mass.

A. Statement-1 is true, statement -2 is true, statement-2 is a correct explanation for statement-1.

B. Statement-1 is true, statement-2 is true, statement-2 is not a correct explanation for statement-1.

C. Statement-1 is true, statement-2 is false.

D. Statement-1 is false, statement-2 is true.

Answer: B

View Text Solution

Section Iv

1. Match the Column-I with Column-II :

Column-I	Column-II
(a) 10 volume H_2O_2	(p) Perhydrol
(b) 20 volume H_2O_2	(q) 5.358 N
(c) 30 volume H_2O_2	(r) 1.785 M
(d) 100 volume H_2O_2	(s) 3.03%

View Text Solution

2. Match the Column-I with Column-II :

Column-I (Acid)	Column-II (Information)
(a) CH_3COOH	(p) Tribasic (E_w = M.w./3)
(b) H_3PO_4	(q) Dibasic reducing
(c) H_2SO_4	(r) Dibasic (E_w = M.w./2)
(d) H_3PO_3	(s) Monobasic (E_w = M.w.)

Watch Video Solution

3. Match the Column-I with Column-II :

Column-I (Reaction)	Column II (Equivalent mass of reactant)
(a) $NH_3 \longrightarrow NO_3^-$	(p) M.w./20
(b) $Fe_2S_3 \longrightarrow FeSO_4 + SO_2$	(q) M.w./2
(c) $CaCO_3 + 2HCl \longrightarrow CaCl_2 + H_2O + CO_2$	(r) M.w./8
(d) $CuS \longrightarrow CuSO_4$	(s) 50

View Text Solution

Section V

1. What volume of 0.1 M HCl will be oxidised by 1 mL of 0.1 M $KMnO_4$?

Watch Video Solution

2. In how many acids among following, the basicity is greater than 1 ?

$H_3PO_4, H_3PO_3, H_3PO_2, H_3BO_3$

Watch Video Solution

3. A sample of H_2O_2 is labelled 10 vol. Its percentage strength will be nearly___ %.

Watch Video Solution