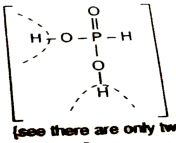
CHEMISTRY

PHYSICAL, INORGANIC, AND ORGANIC CHEMISTRY

EQUIVALENT CONCEPT & TITRATIONS

Solved Examples

1. HCl . H_2SO_4 H_3PO_4 H_3PO_3 

{see there are only two replaceable H^+ions}

View Text Solution

2.

	NaOH,	KOH
v.f ⟶	1	1
Eq. wt. ⟶	$M/1$	$M/1$

View Text Solution

3. $2NaOH + H_2SO_4 \rightarrow Na_2SO_4 + 2H_2O$
Base Acid

Watch Video Solution

4. $2NaOH + H_2SO_4 \rightarrow Na_2SO_4 + 2H_2O$
Base Acid
write the valency factor of NaOH.

Watch Video Solution

5. $Na_2CO_3, \quad Fe_2(SO_4)_3, \quad FeSO_4.7H_2O$

Watch Video Solution

6. $Na_2CO_3 + HCl \rightarrow NaHCO_3 + NaCl$
Base Acid

Watch Video Solution

7. $KMnO_4 + H_2O_2 \rightarrow Mn^{2+} - O_2$

Watch Video Solution

8. Calculate the normality of a solution containing 15.8 g of $KMnO_4$ in 50 mL acidic solution.

Watch Video Solution

9. Calculate the normality of a solution obtained by mixing 50mL of 5M solution of $K_2Cr_2O_7$ and 50mL of 2 M $K_2Cr_2O_7$ in acidic medium.

Watch Video Solution

10. Find the number of moles of $KMnO_4$ needed one mole Cu_2S in acidic medium.

The reaction is $KMnO_4 + Cu_2S \rightarrow Mn^{2+} + Cu^{2+} + SO_2$

Watch Video Solution

11. The number of moles of oxalate ions oxidised by one mole of MnO_4^- ion in acidic medium is :

Watch Video Solution

12. How many millilitres of 0.02 M $KMnO_4$ solution would be required to exactly titrate 25 mL of 0.2 M $Fe(NO_3)_2$ solution in acidic medium ?

Watch Video Solution

13. Write the balanced reaction of titration of $KMnO_4$ Vs oxalic acid in presence of H_2SO_4.

Watch Video Solution

14. Write the balanced reaction of titration of $KMnO_4$ vs ferrous ammonium sulphate in presence of H_2SO_4.

View Text Solution

15. The sulphur content of a steel sample is determined by converting it to H_2S gas, absorbing the H_2S in 10 mL of 0.005 M I_2 and then back titrating the excess I_2 with 0.002 M $Na_2S_2O_3$. If 10 mL $Na_2S_2O_3$ is required for the titration , how many milligrams of sulphur are contained in the sample ?

Reactions :

$$H_2S + I_2 \rightarrow S + 2I^- + 2H^+ \quad , \quad I_2 + 2S_2O_3^{2-} \rightarrow 2I^- + S_4O_6^{2-}$$

Watch Video Solution

16. 3.55 g sample of bleaching powder suspended in H_2O was treated with enough acetic acid and KI solution. Iodine thus liberated required 80 mL of 0.2 M hypo for titration. Calculate th % of available chlorine.

View Text Solution

17. 0.00012% $MgSO_4$ and $0.000111\ \%\ CaCl_2$ is present in water. What is the measured hardness of water and millimoles of washing soda required to purigy water 1000 L water ?

View Text Solution

18. What volume of water is required (in mL) to prepare 1 L of 1 M solution of H_2SO_4 (density = 1.5g/mL) by using 109% oleum and water only (Take density of pure water = 1g/mL).

View Text Solution

Miscellaneous Solved Problems

1. Find the the valency factor for following acids

$(i)CH_3COOH \quad (ii)NaH_2PO_4 \quad (iii)H_3BO_3$

Watch Video Solution

2. Find the valency factor for following bases :

$(i)Ca(OH)_2 \quad (ii)CsOH \quad (iii)Al(OH)_3$

Watch Video Solution

3. Find the valence factor for following salts :

(i) $K_2SO_4.\ Al_2(SO_4)_3.24H_2O \quad (ii)CaCO_3$

Watch Video Solution

4. Calculate the normality of a solution obtained by mixing 50mL of 5M solution of $K_2Cr_2O_7$ and 50mL of 2 M $K_2Cr_2O_7$ in acidic medium.

Watch Video Solution

5. Calculate the normality of a solution containing 13.4 g fo sodium oxalate in 100mL solution.

Watch Video Solution

6. The number of moles of ferrus oxalate oxidised by one mole of $KMnO_4$ in acidic medium is:

A. $5/2$

B. $2/5$

C. $3/5$

D. $5/3$

Answer: D

Watch Video Solution

7. How many moles of $KMnO_4$ are needed to oxidise a mixture of 1 mole of each $FeSO_4 \& FeC_2O_4$ in acidic medium :

A. $4/5$

B. $5/4$

C. $3/4$

D. $5/3$

Answer: A

Watch Video Solution

8. A sample of hydrazine sulphate $[N_2H_6SO_4]$ was dissolved in 100 mL water. 10 mL of this solution was treated with excess of $FeCl_3$ Sol. Ferrous ions formed were estimated and it required 20 mL of M/50 $KMnO_4$ solution in acidic medium.

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

$MnO_4^- + Fe^{2+} + H^+ \rightarrow MN^{2+} + Fe^{3+} + H_2O$

(a) Write the balanced redox reactions.

(b) Estimate the amount of hydrazine sulphate in one litre of Sol.

View Text Solution

9. Write the balanced redox reaction and calculate the equivalent weight of oxidising agent and reducing agent for titration of $K_2Cr_2O_7$ Vs Ferrous ammonium sulphate.

View Text Solution

10. One litre of acidified $KMnO_4$ solution containing 15.8g $KMnO_4$ is decolourized by passing sufficient SO_2 . If SO_2 is produced by FeS_2 , what is the amount of FeS_2 required to give desired SO_2?

Watch Video Solution

11. 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 I_2 consumed 45.0 " mL of " thiosulphate solution to decolourise the blue starch-iodine complex. Calculate the molarity of the sodium thosulphate solution.

A. 0.0623 M

B. 0.0313 M

C. 0.126 M

D. 0.252 M

Answer: A

Watch Video Solution

12. Calculate the percentage of available chlorine in a sample of 3.55g of bleaching powder which was dissolved in 100mL of water. 25mL of this

solution, on treatment with KI and dilute acid, required 20 mL of 0.125 N sodium thiosulphate solution.

Watch Video Solution

Exercise 1 Part I

1. Determine the equivalent weight of the following ions :

$(a) Na^{+} \quad (b) Al^{3+} \quad (c) NO^{+} \quad Cl^{-}$

$(e) CO_3^{2-} \quad SO_4^{2-} \quad (g) PO_4^{3-}$

Watch Video Solution

2. Determine the equivalent weights of the following salts:

$(a) NaCl \quad (b) K_2SO_4 \quad Ca_3(PO_4)_2$

Watch Video Solution

3. 1.12 litre dry chlorine gas at STP was passed over a heated metal when 5.56 g of chloride of the metal was formed. What is the equivalent weight of the metal ?

View Text Solution

4. A mixture of CuS (molecular weight = M_1) and Cu_2S (molecular weight $= M_2$) is oxidised by $KMnO_4$ (molecular weight $= M_3$) in acidic medium, where the product obtained are Cu^{2+}, Mn^{2+} and SO_2. Find the equivalent weight of CuS, Cu_2S and $KMnO_4$ respectively.

Watch Video Solution

5. Determine the equivalent weight of the following oxidising and reducing agents :

(a) $KMnO_4$ (reacting in acidic medium $MnO_4^- \rightarrow Mn^{2+}$)

(b) $KMnO_4$ (reacting in neutral medium $MnO_4^- \rightarrow MnO_2$)

Watch Video Solution

Watch Video Solution

6. 0.98 g of the metal sulphate was dissolved in water and excess of barium chloride was added. The precipitated barium sulphate weighted 0.95 g. Calculate the equivalent weight of the metal.

Watch Video Solution

7. A dilute solution of H_2SO_4 is made by adding 5 mL of $3NH_2SO_4$ to 245 mL of water. Find the normality and molarity of the diluted solution.

View Text Solution

8. What volume at NTP of gaseous ammonia will be required to be passed into $30cm^3$ of 1 N H_2SO_4 solution to bring down the acid strength of the latter of 0.2 N ?

View Text Solution

9. 1.60 g of a metal A and 0.96 g of a metal B when treated with excess of dilute acid, separately, produced the same amount of hydrogen. Calculate the equivalent weight of A if the equivalent weight of B is 12.

View Text Solution

10. It requires 40mL of 1 M Ce^{4+} to titrate 20mL of 1 M Sn^{2+} to Sn^{4+}. What is the oxidation state of the cerium in the product?

Watch Video Solution

11. 25 mL of a solution of Fe^{2+} ions was titrated with a solution of the oxidizing agent $Cr_2O_7^{2-}$. 50 mL of 0.01 M $K_2Cr_2O_7$ solution was required. What is the molarity of the Fe^{2+} solution ?

View Text Solution

12. How many mL of 0.3M $K_2Cr_2O_7$ (acidic) is required for complete oxidation of 5 mL of 0.2 M SnC_2O_4 solution.

View Text Solution

13. 10g sample of bleaching powder was dissolved into water to make the solution one litre. To this solution 35 mL of 1.0 M Mohr salt solution was added containing enough H_2SO_4. After the reaction was complete, the excess Mohr salt required 30 mL of 0.1 M $KMnO_4$ for oxidation. The % of availabel Cl_2 approximately is (mol wt = 71)

View Text Solution

14. A mixture containing As_2O_3 and As_2O_5 required 20 mL of 0.05 N iodine solution for titration. The resulting solution is then acidified and excess of Kl was added. The liberated iodine required 1.116 g hypo $(Na_2S_2O_3.5H_2O)$ for complete reaction. Calculate the mass of the mixture. The reactions are :

$As_2O_3 + 2l_2 + 2H_2O \rightarrow As_2O_5 + 4H^+ + 4l^-$

$As_2O_5 + 4H^+ + 4l^- \rightarrow As_2O_3 + 2l_2 + 2H_2O$ (Atomic weight : As = 75)

View Text Solution

15. $20mlofH_2O_2$ after acidification with dilute H_2SO_4required 30mlof $\frac{N}{12}KMnO_4$ for complete oxidation. The approximate strength of H_2O_2 solution (ing/L)is : [Molar mass of $H_2O_2 = 34$]

Watch Video Solution

16. A 100 mL sample of water was treated to convert any iron present to Fe^{2+}. Addition of 25 mL of 0.002 M $K_2Cr_2O_7$ resulted in the reaction :

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

The excess $K_2Cr_2O_7$ was back-titrated with 7.5 mL of 0.01 M Fe^{2+} solution. Calcution the parts per million (ppm) of iron in the water sample.

View Text Solution

17. By which reason temporary and permanent hardness occur ?

Watch Video Solution

18. Define two method by which we can soften the water sample.

Watch Video Solution

Exercise 1 Part Ii

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

A. $\frac{y-x}{x} \times 8$

B. $\frac{x}{(y-x)} \times 8$

C. $\frac{x}{y} \times 8$

D. $\frac{x+y}{x} \times 8$

Answer: B

Watch Video Solution

2. Equivalent weight of H_3PO_4 in each of the reaction will be respectively

- $H_3 + OH^- \rightarrow H_2PO_4 + H_2$

$H_3PO_4 + 2OH^- \rightarrow HPO_4^{2-} + 2H_2O$

$H_3PO_4 + 2OH^- \rightarrow PO_4^{3-} + 3H_2O$

A. 98, 49, 32.67

B. 49, 98, 32. 67

C. 98, 32.67, 49

D. 32.67, 49, 98

Answer: A

Watch Video Solution

3. $3g$ of an oxide of a metal is converted completely to $5g$ chloride. Equivalent weight of metal is:

A. 33.25

B. 3.325

C. 12

D. 20

Answer: A

Watch Video Solution

4. An ion is reduced to the element when it absords 6×10^{20} electrons. The number of equivalents of the ion is:

A. 0.1

B. 0.01

C. 0.001

D. 0.0001

Answer: C

Watch Video Solution

5. When N_2 is converted into NH_3, the equivalent weight of nitrogen will be:

A. 1.67

B. 2.67

C. 3.67

D. 4.67

Answer: D

Watch Video Solution

6. In the ionic equation $2K^+BrO_3^- + 12H^+ + 10e^- \rightarrow Br_2 + 6H_2O + 2K^+$, the equivalent weight of $KBrO_3$ will be :

(where M = molecular weight of $KBrO_3$)

A. M/5

B. M/2

C. M/6

D. M/4

Answer: A

Watch Video Solution

7. If one mole of H_2SO_4 reacts with one mole of NaOH, equivalent weight of H_2SO_4 will be :

A. 98

B. 49

C. 96

D. 48

Answer: A

Watch Video Solution

8. How many millilitres of $0.1NH_2SO_4$ solution will be required for complete reaction with a solution containing 0.125 g of pure Na_2CO_3?

A. 23.6 mL

B. 25.6 mL

C. 26.3 mL

D. 32.6 mL

Answer: A

Watch Video Solution

9. One litre of a solution contains 18.9 g of HNO_3 and one litre of another solution contains 3.2 g of NaOH. In what volume ratio must these solution be mixed to obtain a neutral solution ?

A. $3:8$

B. $8:3$

C. $15:4$

D. $4:15$

Answer: D

View Text Solution

10. If equal volumes of $0.1MKMnO_4$ and $0.1MK_2Cr_2O_7$ solutions are allowed to oxidise Fe^{2+} to Fe^{3+} in acidic medium, then Fe^{2+} oxidised will be:

A. more by $KMnO_4$

B. more by $K_2Cr_2O_7$

C. equal in both cases

D. cannot be determined.

Answer: B

Watch Video Solution

11. Which of the following solutions will exactly oxidize $25mL$ of an acid solution of $0.1MFe\ (II)$ oxalate?

A. 25 mL of 0.1 M $KMnO_4$

B. 25 mL of 0.2 M $KMnO_4$

C. 25 mL of 0.6 M $KMnO_4$

D. 15 mL of 0.1 M $KMnO_4$

Answer: D

Watch Video Solution

12. An element A in a compound ABD has oxidation number A^{n-}. It is oxidised by $Cr_2O_7^{2-}$ in acid medium. In the experiment 1.68×10^{-3} moles of $K_2Cr_2O_7$ were used for 3.26×10^{-3} moles of ABD. The new oxidation number of A after oxidation is:

A. 3

B. 3-n

C. n-3

D. $+n$

Answer: B

Watch Video Solution

13. The number of moles of oxalate ions oxidised by one mole of MnO_4^- ion in acidic medium is :

A. $5/2$

B. $2/5$

C. $3/5$

D. $5/3$

Answer: A

Watch Video Solution

14. The percentage of available chlorine in a commercial sampleof bleaching powder is

A. 52.9%

B. 55.9%

C. 58%

D. 60%

Answer: B

Watch Video Solution

15. A 0.2 g sample containing copper (II) was analysed iodometrically, where copper (II) is reduced to copper (I) by iodide ions.

$2Cu^{2+} + 4I^- \rightarrow 2CuI + I_2$

If 20 mL of 0.1 M $Na_2S_2O_3$ solution is required for titration of the liberated iodine, then the percentage of copper in the sample will be :

A. $31.75\ \%$

B. $63.5\ \%$

C. $53\ \%$

D. $37\ \%$

Answer: B

View Text Solution

16. A substance which participates readily in both acid-base and oxidation-reduction reactions is:

A. Na_2CO_3

B. KOH

C. $KMnO_4$

D. $H_2C_2O_4$

Answer: D

Watch Video Solution

17. A fresh H_2O_2 solution is labeled as 11.2 V. Calculate its concentration in wt/vol percent.

A. 3.4

B. 6.8

C. 1.7

D. 13.6

Answer: A

Watch Video Solution

18. The amount of lime, $Ca(OH)_2$ required to remove the hardness in 60 L of pond water containing 1.62 mg of calcium bicarbonate per 100 ml of water, will be :

A. $4.44g$

B. $0.222g$

C. $2.22g$

D. $0.444g$

Answer: D

View Text Solution

19. What will the concentration of $\left[Ca^{+2}\right]$ in a sample of 1 litre hard water if after treatment with washing soda 10 g insoluable $CaCO_3$ is precipitated.

A. 0.2 M

B. 0.1 M

C. 0.3 M

D. 0.4 M

Answer: B

Watch Video Solution

Exercise 1 Part Iii

1.

column I	column II
(A) $4.1 g H_2SO_3$	(p) 200 mL of 0.5 N base is used for comple
(B) $4.9 g H_3PO_4$	(q) 200 millimoles of oxygen atoms
(C) $4.5 g$ oxalic acid $(H_2C_2O_4)$	(r) Central atom is in its highest oxidatio
(D) $5.3 g Na_2CO_3$	(s) May react with an oxidising agent

View Text Solution

Exercise 2 Part I

1. If the equivalent mass of a metal is double that of oxygen then the weight of its oxide is ___ times greater than the weight of the metal.

A. 1.5

B. 2

C. 0.5

D. 3

Answer: A

Watch Video Solution

2. Oxalic acid, $H_2C_2O_4$, reacts with paramagnet ion according to the balanced equation $5H_2C_2O_4(aq) + 2MnO_4^- \Leftrightarrow 2Mn^{2+}(aq) + 10CO_2(g) + 8H_2O(l)$. The volume in mL of 0.0162 M $KMnO_4$ solution required to react with 25.0 mL of 0.022 M $H_2C_2O_4$ solution is :

A. 13.6

B. 18.5

C. 33.8

D. 84.4

Answer: A

Watch Video Solution

3. x mmol of $KMnO_4$ react completely with y mmol of $MnSO_4$ in presence of fluoride ions to give MnF_4 quantitatively. Then :

A. x=y

B. 4x=y

C. $x > y$

D. $x < y$

Answer: D

View Text Solution

4. 1 mol of H_3PO_2, H_3PO_3 and H_3PO_4 will neutralise x mol $NaOH$, y mol of $Ca(OH)_2$ and z mol of $Al(OH)_3$ respectively (assuming all as strong electrolytes). x, y, z are in the ratio of:

A. $3:1.5:1$

B. $1:2:3$

C. $3:2:1$

D. $1:1:1$

Answer: D

Watch Video Solution

5. The amount of wet NaOH containing 15% water required to prepare 70 liters of 0.5 N solution is:

A. 1.65 kg

B. 1.4 kg

C. 16.5 kg

D. 140 kg

Answer: A

Watch Video Solution

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

What will be the equivalent mass of As_(2)S_(3)` in the above reaction?

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

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

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

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

Answer: D

Watch Video Solution

7. If 25mL of a H_2SO_4 solution reacts completely with $1.06g$ of pure Na_2CO_3 , what is the normality of this acid sotution :

A. 1 N

B. 0.5 N

C. 1.8 N

D. 0.8 N

Answer: D

Watch Video Solution

8. 125mL of 63% (w/v) $H_2C_2O_4.2H_2O$ solution is made to react with 125mL of a 40% (w/v) $NaOH$ solution. The resulting solution is : (ignoring hydrolysis of ions)

A. netural

B. acidic

C. strongly acidic

D. alkaline

Answer: A

Watch Video Solution

9. $25ml$ of a $0.1(M)$ solution of a stable cation of transition metal z reacts exactly with $25ml$ of $0.04(M)$ acidified $KMnO_4$ solution. Which of the following is most likely to represent the change in oxidation state of Z correctly?

A. $Z^+ \rightarrow Z^{2+}$

B. $Z^{2+} \rightarrow Z^{3+}$

C. $Z^{3+} \rightarrow Z^{4+}$

D. $Z^{2+} \rightarrow Z^{4+}$

Answer: D

Watch Video Solution

10. How many litres of Cl_2 at STP will be liberated by the oxidation of $NaCl$ with $10gKMnO_4$ in acidic medium: (Atomic weight: $Mn = 55$ and $K = 39$)

A. 3.54

B. 7.08

C. 1.77

D. None of these

Answer: A

Watch Video Solution

11. One gram of Na_3AsO_4 is boiled with excess of solid KI in presence of strong HCl. The iodine evolved is absorbed in KI solution and titrated against $0.2N$ hyposolution. Assuming the reaction to be

$$AsO_4^{3-} + 2H^+ + 2I^- \rightarrow AsO_3^{2-} + H_2O + I_2,$$

calculate the volume of arsenate consumed. [Atomic weight of $As = 75$]

A. 48.1 mL

B. 38.4 mL

C. 24.7 mL

D. 30.3 mL

Answer: A

Watch Video Solution

12. If $10g$ of V_2O_5 is dissolved in acid and is reduced to V^{2+} by zinc metal, how many mole I_2 could be reduced by the resulting solution if it is further oxidised to VO^{2+} ions? [Assume no change in state of Zn^{2+} ions] $(V = 51, O = 16, I = 127)$

A. 0.11

B. 0.22

C. 0.055

D. 0.44

Answer: A

Watch Video Solution

13. During the disproportionation of I_2 to iodide and iodate ions, the ratio of iodate and iodide ions formed in alkaline medium is

A. $1:5$

B. $5:1$

C. $3:1$

D. $1:3$

Answer: A

Watch Video Solution

14. If 1 mL of a $KMnO_4$ solution react with 0.140g Fe^{2+} and if 1 mL of KHV_2O_4. $H_{2C_2O_4}$ solution react with o.1 mL of previous $KMnO_4$ solution, how many millilitres of 0.20 M NaOH will react with 1 mL of previous $KHC_2O_4.H_2C_2O_4$ solution in which all the protons $\left(H^+\right)$ are ionisable ?

A. 15/6 mL

B. 13/16

C. $\frac{11}{14}$

D. None of these

Answer: A

View Text Solution

Exercise 2 Part Ii

1. How many equivalents of Mg would have to react in order to liberate $4N_A$ electrons ? $\left(Mg - 2e^- \rightarrow Mg^{2+}\right)$

Watch Video Solution

2. A certain weioght of pure $CaCO_3$ is made to react completely with 200mL of a HCl solution to given 227mL of CO_2 gas at STP. The notmality

of the HCl` solution is :

Watch Video Solution

3. The volume of 3 M $Ba(OH)^2$ solution required to neutralize completely 120 mL of 1.5M H_3PO_4 solution is :

Watch Video Solution

4. $50mL$ of $0.1M$ solution of a salt reacted with $25mL$ of $0.1M$ solution of sodium sulphite. The half reaction for the oxidation of sulphite ion is:

$SO_3^{2-}(aq) + H_2O(l) \rightarrow (aq) + 2H^+(aq) + 2e^-$

If the oxidation number of metal in the salt was 3, what would be the new oxidation number of metal:

Watch Video Solution

5. When tetracarbonylnickel(0) is heated , it dissociates into its components. If 5 moles of this compound is heated and the resulting gaseous component is absorbed by sufficient amount of I_2O_5, liberating I_2. What volume of 4M Hypo solution will be required to react with this I_2 : $Ni(CO)_4 \xrightarrow{A} Ni + 4CO$

View Text Solution

6. 1 mole of OH^- ions is obtained from 85 g of hydroxide of a metal. What is the equivalent weight of the metal ?

Watch Video Solution

7. A metal oxide has 40% oxygen. The equivalent weight of the metal is:

Watch Video Solution

8. In the following reaction:

$3Fe + 4H_2O \rightarrow Fe_3O_4 + 4H_2$, if the atomic weight of iron is 56, then its equivalent weight will be

Watch Video Solution

9. What volume of 0.05 M $Ca(OH)_2$ solution is needed for complete conversion of 10mL of 0.1 M H_3PO_4 into $Ca(H_2PO_4)_2$?

Watch Video Solution

10. Potassium acid oxalate $K_2C_2O_4.3H_2C_2O_4.4H_2O$ can be oxidized by MnO_4^- in acid medium. Calculate the volume of (in mL) 1 M $KMnO_4$ reacting in acid solution with 5.08 gram of the acid oxalate.

View Text Solution

11. In the following reaction, SO_4 acts as a reducing agent:

$SO_2 + Cl_2 + 2H_2O \rightarrow H_2SO_4 + 3HCl$

Find the equivalent weight of SO_2.

Watch Video Solution

Exercise 2 Part Iii

1. In the titration of $K_2Cr_2O_7$ and ferrous sulphate, following data is obtained:

V_1 mL of $K_2Cr_2O_7$ solution of molarity M_1 requires V_2mL of $FeSO_4$ solution of molarity M_2.

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

A. $6M_1V_1 = M_2V_2$

B. $M_1V_1 = 6M_2V_2$

C. $N_1V_1 = N_2V_2$

D. $M_1V_1 = M_2V_2$

Answer: A::C

Watch Video Solution

2. choose the correct statement(s) :

A. 1 mole of MnO_4^- ion can oxidise 5 moles of Fe^{2+} ion in acidic medium.

B. 1 mole of $Cr_2O_7^{2-}$ ion can oxidise 6 moles of Fe^{2+} ion in acidic medium.

C. 1 mole of Cu_2S can be oxidised by 1.6 moles of MnO_4^- ion in acidic medium.

D. 1 mole of Cu_2S can be oxidised by 1.33 moles of $Cr_2O_7^{2-}$ ion in acidic medium.

Answer: A::B::C::D

View Text Solution

3. Which of the following samples of reducing agents is /are chemically equivalent to 25mL of 0.2 N $KMnO_4$ to be reduced to Mn^{2+} and water?

A. 25 mL of 0.2 M $FeSO_4$ to be oxidized to Fe^{3+}

B. 50 mL of 0.1 M H_3AsO_3 to be oxidized to H_3AsO_4

C. 25 mL of 0.1 M H_2O_2 to be oxidiazed to H^+ and O_2

D. 25 mL of 0.1 M $SnCl_2$ to be oxidized to Sn^{4+}

Answer: A::C::D

Watch Video Solution

4. To a 25 mL H_2O_2 solution excess acidified solution of Kl was added. The iodine liberated 20 ml of 0.3 N sodium thiosulphate solution. Use these data to choose the correct statements from the following :

A. The weight of H_2O_2 present in 25 ml solution is 0.102 g

B. The molarity of H_2O_2 solution is 0.12 M

C. The weight of H_2O_2 present in 1 L of the solution is 0.816 g

D. The volume strength of H_2O_2 is 1.344 L

Answer: A::B::D

View Text Solution

5. Two samples of HCl of $1.0M$ and $0.25M$ are mixed. Find volumes of these samples taken in order to prepare $0.75MHCl$ solution. Assume no water is added.

(I) $20mL$, $10mL$ (II) $100mL$, $50mL$k

(III) $40mL$, $20mL$ (IV) $50mL$, $25mL$

A. 20 mL, 10mL

B. 100mL, 50mL

C. 40mL, 20mL

D. 50mL, 25 mL

Answer: A::B::C::D

Watch Video Solution

6. If mass of KHC_2O_4 (potassium acid oxalate) required to reduce 100 mL of 0.02 M $KMnO_4$ in acidic medium is x g and to neutralise 100 mL of 0.05 M $Ca(OH)_2$ is y g, then which of the following options may be correct :

A. If x is 1 g then y is 2 g

B. If x is 5.5g then y is 11g

C. If x is 2g then y is 1g

D. If x is 11g then y is 5.5g

Answer: A::B

View Text Solution

Exercise 2 Part Iv

1. Equivalent Mass

The eqivalent mass of a substance is defined as the number of parts by mass of it which combine with or displace 1.0078 parts by mass of hydrogen, 8 parts by mass of oxygen and 35.5 parts by mass of chlorine. The equivalent mass of a substance expressed in grams is called gram equivalent mass.

The equivalent mass of a substance is not constant. It depends upon the reaction in which the substance is participating. A compound may have different equivalent mass in different chemical reactions and under different experimental conditions.

(a) Equivalent mass of an acid

It is the mass of an acid in grams which contains 1.0078 g of replaceable H^+ ions or it is mass of acid which contains one mole of replaceable H^+ ions. It may be calculated as :

Equivalent mass of acid=$\frac{\text{Molecular mass of acid}}{\text{Basicity of acid}}$

Basicity of acid = Number of replaceable hydrogen atoms present in one molecule of acid

(b) Equivalent mass of a base

It is the mass of the base which contains one mole of replaceable OH^- ions in molecules.

Equivalent mass of base=$\frac{\text{Molecular mass of acid}}{\text{Acidity of acid}}$

Acidity of base= Number of replaceable OH^- ions present in one molecule of the base

Equivalent mass of an oxidising agent

(a) Electron concept:

Equivalent mass of oxidising agent = $\frac{\text{Molecular mass of oxidising agent}}{\text{Number of electrons gained by one molecule}}$

(b) Oxidation number concept:

Equivalent mass of oxidising agent= $\frac{\text{Molecular mass of oxidising agent}}{\text{Total change in oxidation number per molecule of oxidising agent}}$

Equivalent mass of $Ba(MnO_4)_2$ in acidic medium is :(where M stands for molar mass)

A. M/5

B. M/6

C. M/10

D. M/2

Answer: C

Watch Video Solution

2. Equivalent Mass

The eqivalent mass of a substance is defined as the number of parts by mass of it which combine with or displace 1.0078 parts by mass of hydrogen, 8 parts by mass of oxygen and 35.5 parts by mass of chlorine. The equivalent mass of a substance expressed in grams is called gram equivalent mass.

The equivalent mass of a substance is not constant. It depends upon the reaction in which the substance is participating. A compound may have different equivalent mass in different chemical reactions and under different experimental conditions.

(a) Equivalent mass of an acid

It is the mass of an acid in grams which contains 1.0078 g of replaceable H^+ ions or it is mass of acid which contains one mole of replaceable

H^+ ions. It may be calculated as :

Equivalent mass of acid=$\frac{\text{Molecular mass of acid}}{\text{Basicityof acid}}$

Basicity of acid = Number of replaceable hydrogen atoms present in one molecule of acid

(b) Equivalent mass of a base

It is the mass of the base which contains one mole of replaceable OH^- ions in molecules.

Equivalent mass of base=$\frac{\text{Molecular mass of acid}}{\text{Acidity of acid}}$

Acidity of base= Number of replaceable OH^- ions present in one molecule of the base

Equivalent mass of an oxidising agent

(a) Electron concept:

Equivalent mass of oxidising agent = $\frac{\text{Molecular mass of oxidising agent}}{\text{Number of electrons gained by one molecule}}$

(b) Oxidation number concept:

Equivalent mass of oxidising agent= $\frac{\text{Molecular mass of oxidising agent}}{\text{Total change in oxidation number per molecule of oxidising agent}}$

Equivalent mass of $Fe_{0.9}O$ in reaction with acidic $K_2Cr_2O_7$ is : (M= Molar mass)

A. 7 M/10

B. 10 M/7

C. 7 M/9

D. 9 M/7

Answer: B

Watch Video Solution

3. Equivalent Mass

The eqivalent mass of a substance is defined as the number of parts by mass of it which combine with or displace 1.0078 parts by mass of hydrogen, 8 parts by mass of oxygen and 35.5 parts by mass of chlorine. The equivalent mass of a substance expressed in grams is called gram equivalent mass.

The equivalent mass of a substance is not constant. It depends upon the reaction in which the substance is participating. A compound may have different equivalent mass in different chemical reactions and under

different experimental conditions.

(a) Equivalent mass of an acid

It is the mass of an acid in grams which contains 1.0078 g of replaceable H^+ ions or it is mass of acid which contains one mole of replaceable H^+ ions. It may be calculated as :

Equivalent mass of acid=$\frac{\text{Molecular mass of acid}}{\text{Basicityof acid}}$

Basicity of acid = Number of replaceable hydrogen atoms present in one molecule of acid

(b) Equivalent mass of a base

It is the mass of the base which contains one mole of replaceable OH^- ions in molecules.

Equivalent mass of base=$\frac{\text{Molecular mass of acid}}{\text{Acidity of acid}}$

Acidity of base= Number of replaceable OH^- ions present in one molecule of the base

Equivalent mass of an oxidising agent

(a) Electron concept:

Equivalent mass of oxidising agent = $\frac{\text{Molecular mass of oxidising agent}}{\text{Number of electrons gained by one molecule}}$

(b) Oxidation number concept:

Equivalent mass of oxidising agent= $\frac{\text{Molecular mass of oxidising agent}}{\text{Total change in oxidation number per molecule of oxidising agent}}$

Equivalent weight of oxalic acid salt in following reaction is :(Atomic masses:O=16,C=12,K=39) $H_2C_2O_4 + Ca(OH)_2 \rightarrow CaC_2O_4 + H_2O$

A. 90

B. 45

C. 64

D. 128

Answer: C

Watch Video Solution

4. Some amount of "20V" H_2O_2 is mixed with excess of acidified solution of Kl. The iodine so liberated required 200 mL of 0.1 N $Na_2S_2O_3$ for titration.

The volume of H_2O_2 solution is :

A. 11.2 mL

B. 37.2 mL

C. 5.6 mL

D. 22.4 mL

Answer: C

View Text Solution

5. Some amount of "20V" H_2O_2 is mixed with excess of acidified solution of Kl. The iodine so liberated required 200 mL of 0.1 N $Na_2S_2O_3$ for titration.

The mass of $K_2Cr_2O_7$ needed to oxidise the above volume of H_2O_2 solution is :

A. 3.6 g

B. 0.8 g

C. 4.2 g

D. 0.98 g

Answer: D

View Text Solution

6. Some amount of "20V" H_2O_2 is mixed with excess of acidified solution of Kl. The iodine so liberated required 200 mL of 0.1 N $Na_2S_2O_3$ for titration.

The volume of O_2 at STP that would be liberated by above H_2O_2 solution on disproportionation is :

A. 56 mL

B. 112 mL

C. 168 mL

D. 224 mL

Answer: B

View Text Solution

7. Equivalent weight = Molecular weight / Atomic weight / n factor

n factor is very important in redox as well as non-redox reactions.

In general n-factor of acid/base is number of moles of H^+/OH^- furnished per mole of acid/base, n-factor of reactions is number of moles of electrons lost or gained per mole of reactant columns 1, 2, 3 contain reactions, n-factor & equivalent weight respectively.

Column-1		Column-2		Column-3	
(I)	$MnO_4^- + 2H_2O \longrightarrow MnO_2 + 4OH^-$	(i)	1	(P)	158
(II)	$MnO_4 \longrightarrow MnO_4^{-2}$	(ii)	$\frac{10}{6}$	(Q)	96
(III)	$Br_2 + OH^- \longrightarrow BrO_3^- + Br^-$	(iii)	3	(R)	34
(IV)	$H_2O_2 \longrightarrow O_2 + H_2O$	(iv)	2	(S)	52.6

For $KMnO_4$ in strong basic medium correct combination is -

A. (I) (ii) (R)

B. (II) (ii) (P)

C. (II) (iii) (S)

D. (I) (iv) (Q)

Answer: B

View Text Solution

Equivalent weight = Molecular weight / Atomic weight / n factor

n factor is very important in redox as well as non-redox reactions.

In general n-factor of acid/base is number of moles of H^+/OH^- furnished per mole of acid/base. n-factor of reactions is number of moles of electrons lost or gained per mole of reactant columns 1, 2, 3 contain reactions, n-factor & equivalent weight respectively.

8.

	Column-1		Column-2		Column-3
(I)	$MnO_4^- + 2H_2O \longrightarrow MnO_2 + 4OH^-$	(i)	1	(P)	158
(II)	$MnO_4 \longrightarrow MnO_4^{-2}$	(ii)	$\frac{10}{6}$	(Q)	96
(III)	$Br_2 + OH^- \longrightarrow BrO_3^- + Br^-$	(iii)	3	(R)	34
(IV)	$H_2O_2 \longrightarrow O_2 + H_2O$	(iv)	2	(S)	52.6

For $KMnO_4$ in neutral medium correct combination is -

A. (I) (iii) (Q)

B. (II) (i) (R)

C. (I) (iii) (S)

D. (II) (iii) (R)

Answer: C

View Text Solution

Equivalent weight = Molecular weight / Atomic weight
n factor
n factor is very important in redox as well as non-redox reactions.
In general n-factor of acid/base is number of moles of H^+/OH^- furnished per mole of acid/base, n-factor of reactions is number of moles of electrons lost or gained per mole of reactant columns 1, 2, 3 contain reactions, n-factor & equivalent weight respectively.

9.

Column-1		Column-2		Column-3	
(I)	$MnO_4^- + 2H_2O \longrightarrow MnO_2 + 4OH^-$	(i)	1	(P)	158
(II)	$MnO_4 \longrightarrow MnO_4^{-2}$	(ii)	$\frac{10}{6}$	(Q)	96
(III)	$Br_2 + OH^- \longrightarrow BrO_3^- + Br^-$	(iii)	3	(R)	34
(IV)	$H_2O_2 \longrightarrow O_2 + H_2O$	(iv)	2	(S)	52.6

For a disproportionation reaction the only correct combination is -

A. (I) (ii) (R)

B. (II) (ii) (Q)

C. (IV) (i) (S)

D. (III) (ii) (Q)

Answer: D

View Text Solution

Exercise 3 Part I

1. In basic medium, I^- is oxidised by MnO_4^- . In this process, I^- changes to :

A. IO_3^-

B. I_2

C. IO_4^-

D. IO^-

Answer: A

Watch Video Solution

2. Consider a 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

Watch Video Solution

3. 25 mL of household bleach solution was mixed with 30 mL of o.50 M Kl and 10 mL of 4N acetic acid. In the titration of the liberated iodine, 48 mL of 0.25 N $Na_2S_2O_3$ 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

4. For the reaction : $I^- + ClO_3^- + H_2SO_4 \rightarrow Cl^- + HSO_4^- + I_2$

The correct statement(s) in the balanced equation is/are:

A. Stoichiometric coefficient of HSO_4^- is 6.

B. Iodide is oxidized is oxidized.

C. Sulphur is reduced.

D. H_2O is one of the products.

Answer: A::B::D

Watch Video Solution

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

$MnCl_2 + K_2S_2O_8 + H_2O \rightarrow KMnO_4 + K_2SO_4 + HCl$(equation not balanced).

Few drops of concentrated HCl were added to this solution and gently warmed. Further , oxalic acid (225 mg) was added in portions till the colour of the permanganate ion disappeared. Calculate the quantity of $MnCl_2$ (in mg) presence in the initial solution.

(Atomic weights in g mol^{-1}: Mn=55,Cl=35.5)

Watch Video Solution

Exercise 3 Part Ii

1. When $KMnO_4$ acts as an oxidising agnet and ultimetely from MnO_4^{2-}, MnO_2, Mn_2O_3, and Mn^{2+}, then the number of electrons transferred in each case, respectively, are

A. 4, 3, 1, 5

B. 1, 5, 3, 7

C. 1, 3, 4, 5

D. 3, 5, 7, 1

Answer: C

Watch Video Solution

2. What happen when a solution of potassium chromate is treated with an excess of dil. Nitic acid?

A. Cr reduces in the oxidation state +3 from CrO_4^{2-}.

B. Cr oxidises in the oxidation state +7 from CrO_4^{2-}.

C. Cr^{+3} and $Cr_2O_7^{2-}$ will be formed.

D. $Cr_2O_7^{2-}$ and H_2O will be formed.

Answer: D

Watch Video Solution

3. The oxidation state of chrominium in the final product formed in the reaction between KI and acidified potassium dichromate soluttion is

A. $+4$

B. $+6$

C. $+2$

D. $+3$

Answer: D

Watch Video Solution

4. Amount of oxalic acid present in a solution can be determined 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. furnishes H^+ ions in addition to those from oxalic acid.

B. reduces permanganate to Mn^{2+}.

C. oxidises oxalic acid to carbon dioxide and water.

D. gets oxidised by oxalic acid to chlorine.

Answer: D

Watch Video Solution

5. 29.5 mg of an organic compound containing nitrogen was digested according to Kjeldahl's method and the evolved ammonia was absorbed in 20mL of 0.1M HCL solution. The excess of the acid required 15 mL of 0.1 M NaOH solution for complete neutralization. The percentage of nitrogen in the compound is:

A. 59.0

B. 47.4

C. 23.7

D. 29.5

Answer: C

Watch Video Solution

6. Consider the following reaction :

$$xMnO_4^- + yC_2O_4^{2-} + zH^+ \rightarrow xMn^{2+} + 2yCO_2 + \frac{z}{2}H_2O$$

The value of x, y and z in the reaction are, respectively.

A. 5, 2 and 16

B. 2, 5 and 8

C. 2, 5 and 16

D. 5, 2 and 8

Answer: C

Watch Video Solution

7. For the estimation of nitrogen, 1.4 g of an organic compound was digested by Kjeldahl method and the evolved ammonia acid absorbed in 60 mL of $\frac{M}{10}$ sulphuric acid. The unreacted acid required 20 mL of $\frac{M}{10}$ sodium hydroxide for complete neutralization. the percentage of nitrogen in the compound is

A. $6\ \%$

B. $10\ \%$

C. $3\ \%$

D. $5\ \%$

Answer: B

Watch Video Solution

Exercise 3 Jee Main Online Problems

1. Hydrogen peroxide acts both as an oxidising and as a reducing agent depending upon the nature of the reacting species. In which of the following cases H_2O_2 acts as a reducing agent in acid medium ?

A. MnO_4^-

B. $Cr_2O_7^{2-}$

C. SO_3^{2-}

D. Kl

Answer: D

Watch Video Solution

2. Permanent hardness in water cannot be cured by :

A. Treatment with washing soda

B. Boiling

C. Ion exchange method

D. Calgon's method

Answer: B

Watch Video Solution

3. 1.4 g of an organic compound was digested according to Kjeldahl's method and the ammonia evolved was absorbed in 60 mL of M/10 H_2SO_4 solution. The excess sulphuric acid required 20 mL of M/10 NaOH solution for neutralization. The percentage of nitrogen in the compound is :

A. 24

B. 5

C. 10

D. 3

Answer: C

View Text Solution

4. The volume of $0.1N$ dibasic acid sufficient to neutralize 1g of a base that furnishes 0.04 mole of OH^- in aqueous solution is :

A. 400 mL

B. 600 mL

C. 200 mL

D. 80 mL

Answer: C

Watch Video Solution

5. For standardizing NaOH solution, which of the following is used as a primary standard ?

A. Sodium tetraborate

B. Ferrous Ammonium Sulfate

C. Oxalic acid

D. dil. HCl

Answer: C

Watch Video Solution

6. The temporary hardness of water is due to :

A. $CaCl_2$

B. $Ca(HCO_3)_2$

C. NaCl

D. Na_2SO_4

Answer: B

Watch Video Solution

7. In the reaction of oxalate with permanganate in acidic medium, the number of electrons involved in producing one molecule of CO_2 is

A. 5

B. 1

C. 2

D. 10

Answer: B

Watch Video Solution

8. 25 ml of the given HCl solution requires 30 mL of 0.1M sodium carbonate solution. What is the volume of this HCl solution required to titrate 30 mL of 0.2M aqueous NaOH solution ?

A. 12.5 mL

B. 75 mL

C. 50 mL

D. 25 mL

Answer: D

Watch Video Solution

9. the hardness of a water sample (in terms of Equivalents of $CaCO_3$) containing $10^{-3}MCaSO_4$ Is :

(Molar mass of $CaSO_4 = 1365hmol^{-1}$)

A. 10 ppm

B. 50 ppm

C. 90 ppm

D. 100 ppm

Answer: D

Watch Video Solution

10. The volume strength of $1MH_2O_2$ is (Molar mass of $H_2O_2 = 34gmol^{-1}$)

A. 11.35

B. 22.4

C. 16.8

D. 5.6

Answer: A

Watch Video Solution

Apsp Part I

1. In the reaction: $Na_2S_2O_3 + 4Cl_2 + 5H_2O \rightarrow Na_2SO_4 + H_2SO_4 + 8HCl$, the equivalent weight of $Na_2S_2O_3$ will be: (M= molecular weight of $Na_2S_2O_3$)

A. M/4

B. M/8

C. M/1

D. M/2

Answer: B

Watch Video Solution

2. In the reaction

$2CuSO_4 + 4KI \rightarrow 2Cu_2I_2 + I_2 + 2K_2SO_4$ the equivalent weight of $CuSO_4$ will be:

A. 79.75

B. 159.5

C. 329

D. None of these

Answer: B

Watch Video Solution

3. Dichloroacetic acid $(CHCI_2COOH)$ is oxidised to CO_2, H_2O and CI_2 by 600meq of an oxidising agent. Same amount of ammonia to form ammonium dichloroacetate:

A. 0.0167

B. 0.1

C. 0.3

D. 0.6

Answer: B

Watch Video Solution

4. The number of moles of ferrus oxalate oxidised by one mole of $KMnO_4$ in acidic medium is:

A. $5/2$

B. $2/5$

C. $3/5$

D. $5/3$

Answer: D

Watch Video Solution

5. How many moles of $KMnO_4$ are needed to oxidise a mixture of 1 mole of each $FeSO_4 \& FeC_2O_4$ in acidic medium :

A. $4/5$

B. $5/4$

C. $3/4$

D. $5/3$

Answer: A

Watch Video Solution

6. 22.7 mL of (N/10) Na_2CO_3 solution neutralises 10.2 mL of a dilute H_2SO_4 solution. The volume of water that must be added to 400 mL of this H_2SO_4 solution in order to make it exactly N/10.

A. 490.2 mL

B. 890.2 mL

C. 90.2 mL

D. 290.2 mL

Answer: A

Watch Video Solution

7. HNO_3 oxidies NH_4^+ ions to nitrogen and itself gets reduced to NO_2. The moles of HNO_3 required by 1 mole of $(NH_4)_2SO_4$ is:

A. 4

B. 5

C. 6

D. 2

Answer: C

Watch Video Solution

8. The mass of oxalic acid crystals $(H_2C_2O_4.2H_2O)$ required to prepare 50 mL of a 0.2 N solution is:

A. 4.5 g

B. 6.3 g

C. 0.63 g

D. 0.45 g

Answer: C

Watch Video Solution

9. When HNO_3 is converted into NH_3, the equivalent weight of HNO_3 will be:

A. M/2

B. M/1

C. M/6

D. M/8

Answer: D

Watch Video Solution

10. In the conversion $NH_2OH \rightarrow N_2O$, the equivalent weight of NH_2OH will be:

A. M/4

B. M/2

C. M/5

D. M/1

Answer: B

Watch Video Solution

11. Number of moles of CaO required to remove hardness from 1000 litre water having 324 ppm of calcuim bicarbonate and 74.5 ppm of potassium chloride is :

A. 8

B. 4

C. 3

D. 2

Answer: D

View Text Solution

12. A $5.0mL$ of solution of H_2O_2 liberates $0.508g$ of iodine from acidified KI solution. Calculate the strength of H_2O_2 solution in terms of volume strength at STP.

A. 2.24 V

B. 1.12 V

C. 4.48 V

D. 8.96 V

Answer: C

Watch Video Solution

13. When hypo solution is added to $KMnO_4$ solution then

A. $Na_2S_2O_3$ is converted to Na_2SO_4

B. $Na_2S_2O_3$ is converted to $Na_2S_4O_6$

C. $KMnO_4$ is converted to K_2MnO_4

D. $KMnO_4$ is converted to $MnSO_4$

Answer: A

Watch Video Solution

14. Which of the following equations is a balanced one?

A. $5BiO_3^- + 22H^+ + Mn^{2+} \rightarrow 5Bi^{3+} + 7H_2O + MnO_4^-$

B. $5BiO_3^- + 14H^+ + 2Mn^{2+} \rightarrow 5Bi^{3+} + 7H_2O + 2MnO_4^-$

C. $2BiO_3^- + 4H^+ + Mn^{2+} \rightarrow 2Bi^{3+} + 2H_2O + MnO_4^-$

D. $6BiO_3^- + 12H^+ + 3Mn^{2+} \rightarrow 6Bi^{3+} + 6H_2O + 3MnO_4^-$

Answer: B

Watch Video Solution

15. 10mL of sulphuric acid solution (specific gravity= 1.84) contains 98% by weight of pure acid . Calculate the volume (in mL) of 2N NaOH solution required to just neutrililze the acid.

A. 9.2 mL

B. 92 mL

C. 18.4 mL

D. 184 mL

Answer: D

Watch Video Solution

16. 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

Watch Video Solution

17. An aqueous solution of $6.3g$ oxalic acid dihydrate is made up to $250mL$. The volume of $0.1NNaOH$ required to completely neutralise $10mL$ of this solution is

A. 40 mL

B. 20 mL

C. 10 mL

D. 4 mL

Answer: A

Watch Video Solution

18. In the reaction $H_2O_2^{18} + O_3 \rightarrow$ water + oxygen, radioactivity will be shown by which of the product ?

A. water

B. oxygen

C. both (1) & (2)

D. None of these

Answer: B

Watch Video Solution

19. 1 mole of how many of the following acids neutralize exactly one mol of NaOH, under required favourable conditions ? HCl, HNO_3, H_2SO_4, H_2SO_3, H_3PO_4, H_3PO_2, $H_4P_2O_5$, H_3BO_3

A. 4

B. 7

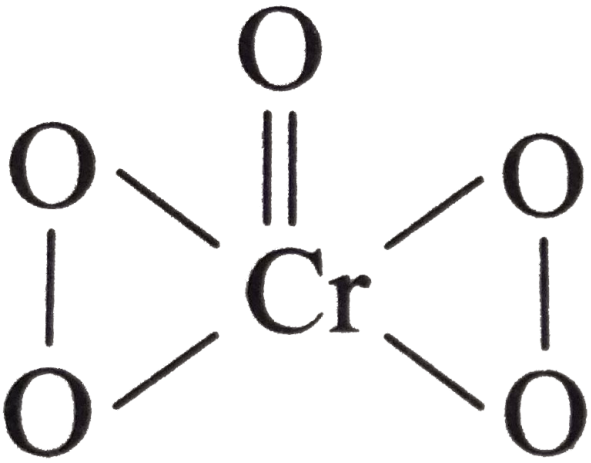
C. 8

D. 9

Answer: A

Watch Video Solution

20. Compound CrO_5 has structure as shown



ltbtgt The oxidation number fo Cr in the above compound is .

A. 4

B. 5

C. 6

D. 0

Answer: C

Watch Video Solution

21. The normality of orthophosphoric acid having purity of 70% by weight and specific gravity 1.54 is :

A. 11 N

B. 22 N

C. 33 N

D. 44 N

Answer: C

Watch Video Solution

22. The normality of mixture obtained by mixing 100 mL of 0.2 M H_2SO_4 and 200 mL of 0.2 M HCl is

A. 0.0267

B. 0.2670

C. 1.0267

D. 1.1670

Answer: B

Watch Video Solution

23. The reagent commonly used to determine hardness of water titrimetrically is :

A. oxalic acid

B. disodium salt of EDTA

C. sodium citrate

D. sodium thiosulphate

Answer: B

Watch Video Solution

24. 40 mL of 0.05 M solution of sodium sesquicarbonate $(Na_2CO_3.NaHCO_3.2H_2O)$ is titrated against 0.05 M HCl.When phenoplhthalein is used as indicator, x mL HCl is used. In a separate titration of same using methyl orange as indicator, y ml of HCl is used . The value of (y-x) is :

A. 80 mL

B. 30 mL

C. 120 mL

D. 180 mL

Answer: A

Watch Video Solution

25. In the following reaction

$$2MnO_4^- + 5H_2O_2^{18} + 6H^+ \rightarrow 2Mn^{2+} + 8H_2O + 5O_2$$

The radioactive oxygen will appear in :

A. H_2O

B. O_2

C. both

D. above reaction does not take place

Answer: B

Watch Video Solution

26. One gram equimolecular mixture of Na_2CO_3 and $NaHCO_3$is reacted with 0.1 NHCl. The milliliters of 0.1 N HCl required to react completely with the above mixture is :

A. 15.78 mL

B. 157.8 mL

C. 198.4 mL

D. 195.5 mL

Answer: B

Watch Video Solution

27. Which of the following is not a redox reaction ?

A. $KCN + Fe(CN)_2 \rightarrow K_4\left[Fe(CN)_6\right]$

B. $Rb + H_2O \rightarrow RbOH + H_2$

C. $H_2O_2 \rightarrow H_2O + O$

D. $CuI_2 \rightarrow CuI + I_2$

Answer: A

Watch Video Solution

28. Equivalent weight of chlorine molecule in the equation is :

$3Cl_2 + 6NaOH \rightarrow 5NaCl + NaClO_3 + 3H_2O$

A. 42.6

B. 35.5

C. 59.1

D. 71

Answer: A

Watch Video Solution

29. $Cr_2O_7^{2-} \xrightarrow{H^+} Cr^{3+}$, Eq. wt. of $Cr_2O_7^{2-}$ is :-

Watch Video Solution

30. One mole of acidified $K_2Cr_2O_7$ on reaction with excess of KCl will liberate....., moles of I_2.

A. 6

B. 1

C. 7

D. 3

Answer: D

Watch Video Solution

Apsp Part Ii

1. If the equivalent weight of an element is 32, then the percentage of oxygen in its oxide is :

A. 16

B. 40

C. 32

D. 20

Answer: D

Watch Video Solution

2. In alkaline medium , $KMnO_4$ reacts as follows

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

Therefore, the equivalent mass of $KMnO_4$ will be

A. 31.6

B. 63.2

C. 126.4

D. 158

Answer: D

Watch Video Solution

3. When 25 g of Na_2SO_4 is dissolved in 10^3 Kg of solution, its concentration will be

A. 2.5 ppm

B. 25 ppm

C. 250 ppm

D. 100 ppm

Answer: B

Watch Video Solution

4. Which amongst the following has the highest normality ?

A. 16.0 g of NaOH in 200 mL of water

B. 1 N oxalic acid

C. 2 M sulphuric acid

D. 1.5 hydrochloric acid

Answer: C

Watch Video Solution

5. The volume of water which must be added to $0.4dm^3$ of 0.25 N oxalic acid in order to make it exactly decinormal is :

A. $0.2dm^3$

B. $0.4dm^3$

C. $0.6dm^3$

D. $0.8dm^3$

Answer: C

Watch Video Solution

6. The quantity of electricity requried to reduce 0.05 mol of MnO_4^- to Mn^{2+} in acidic medium would be

A. 0.01 F

B. 0.05 F

C. 0.15 F

D. 0.25 F

Answer: D

Watch Video Solution

7. You are given a solution of an alkali. In order to estimate its concentration in terms of normality , you need to know

A. the volume of the solution, the volume of the alkali present in it and its formula weight

B. the mass of the solution, the mass of the alkali present in it and its equivalent weight.

C. the volume of the solution, the solution, the mass of the alkali present in it and its equivalent weight.

D. the mass of the solution, the volume of the alkali present in it and its equivalent weight.

Answer: C

Watch Video Solution

8. The normality of '20 volume ' H_2O_2 solution is

A. 2.0

B. 2.5

C. 3.0

D. 3.5

Answer: D

Watch Video Solution

9. Hydrazine N_2H_4 acts as a reducing agent. To prepare 100 ml of 2 N hydrazine solution, the weight required will be

A. 6.4 g

B. 1.6 g

C. 3.2 g

D. 0.8 g

Answer: B

Watch Video Solution

10. For the reaction shown below, which statement is true ?

$2Fe + 3CdCl_2 \Leftrightarrow 2FeCl_3 + 3Cd$

A. Fe is the oxidizing agent

B. Cd undergoes oxidation

C. Cd is the reducing agent

D. Fe undergoes oxidation

Answer: D

Watch Video Solution

11.

$5H_2C_2O_4(aq) + 2MnO_4(aq) + 6H^+(aq) \rightarrow 2Mn^{2+}(aq) + 10CO_2(g) + 8$

Oxalic acid, $H_2C_2O_2$, reacts with permanganate ion accroding to the balanced equation above. How many mL of 0.0154 M $KMnO_4$ solution are required to react with 25.0mL of 0.0208 M $H_2C_2O_4$ solution?

A. 13.5 mL

B. 18.5 mL

C. 33.8 mL

D. 84.4 mL

Answer: A

Watch Video Solution

12. What volume of water is requried to make $0.20N$ solution from $1600mL$ of $0.2050N$ solution?

A. 40 mL

B. 50 mL of 0.1 M H_3AsO_3 to be oxidized to H_3AsO_4

C. 100 mL

D. 20 mL

Answer: A

Watch Video Solution

13. Oxalic acid, $H_2C_2O_4$, reacts with paramagnet ion according to the balanced equation $5H_2C_2O_4(aq) + 2MnO_4^-(aq) + 6H^+(aq) \Leftrightarrow 2Mn^{2+}(aq) + 10CO_2(g) + 8$. The volume in mL of 0.0162 M $KMnO_4$ solution required to react with 25.0 mL of 0.022 M $H_2C_2O_4$ solution is

A. 13.6

B. 18.5

C. 33.8

D. 84.4

Answer: A

Watch Video Solution

14. A 500 g toothpaste sample has 0.4 g fluoride concentration. The fluoride concentration in terms of ppm will be

A. 200

B. 400

C. 500

D. 800

Answer: D

Watch Video Solution

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

A. 1

B. $1/5$

C. $3/5$

D. $4/5$

Answer: C

Watch Video Solution

16. Role of hydrogen peroxide iin the following reaction is respectively.

$(i) \quad H_2O_2 + O_3 \rightarrow H_2O + ZO_2$

$(ii) \quad H_2O_2 + Ag_2O \rightarrow Aag + H_2O + O_2$

A. oxidising in I and reducing in II

B. reducing in I and oxidising in II

C. reducing in I as well as in II

D. oxidising in I as well as in II

Answer: C

Watch Video Solution

17. A bottle of H_3PO_4 solution contains 70% acid. If the density of the solution is $1.54gcm^{-3}$, the volume of the H_3PO_4 solution required to prepare 1L of IN solution is .

A. 90 mL

B. 45mL

C. 30mL

D. 23mL

Answer: C

View Text Solution

18. The unbalanced equation for the reaction of P_4S_3 with nitrate in aqueous acidic medium is given below :

$$P_4S_3 + NO_3^- \rightarrow H_3PO_4 + SO_4^{2-} + NO$$

the number of moles of water reuired per mole of P_4S_3 is :

A. 18

B. $8/3$

C. 8

D. 28

Answer: B

Watch Video Solution

19. In the redox reaction,

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

20mL of 0.1 M $KMnO_4$ reacts quantitatively with :

A. 20 mL of 0.1 M oxalate

B. 40 mL of 0.1 M oxalate

C. 50 mL of 0.25 M oxalate

D. 50 mL of 0.1 M oxalate

Answer: D

Watch Video Solution

20. 1.250 g of metal carbonate (MCO_3) was treated with 500 mL of 0.1 M HCl solution. The unreacted HCl required 50.0 mL of 0.500 M NaOH solution for neutralization, Identify the metal M

A. Mg

B. Ca

C. Sr

D. Ba

Answer: B

View Text Solution

21. Battery acid (H_2SO_4) has density 1.285 g cm^{-3} , 10.0 cm^3 of this acid is diluted to 1L . 25.0 cm^3 of this diluted solution requires $25.0cm^3$ of 0.1 N sodium hydroxide solution for neutralization. The percentage of sulphuric acid by mass in the battery acid is :

A. 98

B. 38

C. 19

D. 49

Answer: B

View Text Solution

22. A sample of water from a river was analyzed for the presence of metal ions and the observations were recorded as given below

Reagent added	Observation
dil. HCl	No change
aq. Na_2CO_3	White precipitate
Aq. Na_2SO_4	No change

The water sample is likely to contain

A. Ba^{2+}

B. Cu^{2+}

C. Li^{+}

D. Mg^{2+}

Answer: D

Watch Video Solution

23. RH_2 (ion exchange resin) can replace Ca^{2+} d in hard water as.

$RH_2 + Ca^{2+} \rightarrow RCa + 2H^+$

1litre of hard water passing through RH_2 has $pH2$. Hence hardness in $ppm\text{of}Ca^{2+}$ is:

A. 50

B. 100

C. 125

D. 200

Answer: D

Watch Video Solution

Apsp Part Iii

1. A solution containing Na_2CO_3 and $NaOH$ requires $300ml$ of $0.1NHCl$ using phenolphthalein as an indicator. Methyl orange is then added to the above titrated solution when a further $25ml$ of $0.2NHCl$ is required. The amount of $NaOH$ present in solution is $(NaOH = 40, Na_2CO_3 = 106)$

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

3. 0.7g of $(NH_4)_2SO_4$ sample was boiled with 100mL of 0.2 N NaOH solution was diluted to 250 ml. 25mL of this solution was neutralised using 10mL of a 0.1 N H_2SO_4 solution. The percentage purity of the $(NH_4)_2SO_4$sample is :

A. 94.3

B. 50.8

C. 47.4

D. 79.8

Answer: A

Watch Video Solution

4. A mixture of 0.02 mole of $KBrO_3$ and 0.001 mole of KBr was treated with excess of KI and acidified. The volume of 0.01M $Na_2S_2O_3$ solution

required to consume the liberated iodine will be :

A. 1000 mL

B. 1200 mL

C. 1500 mL

D. 800 mL

Answer: B

Watch Video Solution

5. 10 mL of a H_2SO_4 solution is diluted to 100 mL. 25 mL of this diluted solution is mixed with 50 mL of 0.5 N NaOH solution. The resulting solution requires 0.265 g Na_2CO_3 for complete neutralization. The normality of original H_2SO_4 solution is :

A. 12 N

B. 11 N

C. 3N

D. 0.275 N

Answer: A

Watch Video Solution

6. Dichloroacetic acid $(CHCI_2COOH)$ is oxidised to CO_2, H_2O and CI_2 by 600meq of an oxidising agent. Same amount of ammonia to form ammonium dichloroacetate:

A. 0.0167

B. 0.1

C. 0.3

D. 0.6

Answer: B

Watch Video Solution

7. 1.2g of carbon is burnt completely in oxygen (limted supply) to produce CO and CO_2 . This mixture of gases is treated with solid I_2O_5 (to know the amount of CO produced). The librated iodine required 120 ml of 0.1m hypo solution for complete titration. The percentage carbon converted into CO is :

A. 0.6

B. 1

C. 0.5

D. 0.3

Answer: D

Watch Video Solution

8. A mixed solution of potassium hydroxide and sodium carbonate required 15 mL of an N/20 HCl solution when titrated with phenolphthalein as an indicator. But the same amount of the solution,

when titrated with methyl orange as an indicator , required 25 mL of the same acid. The amount of KOH present in the solution is :

A. 0.014g

B. 0.14g

C. 0.028g

D. 1.4g

Answer: A

Watch Video Solution

9. Phenolphthale is not a good indicator for titrating :

A. NaOH against oxalic acid

B. NaOH against HCl

C. Ferrous sulphate against $KMnO_4$

D. NaOH against H_2SO_4

Answer: C

View Text Solution

10. A 1 g sample of H_2O_2 solution containing x % H_2O_2 by mass requires x cm^3 of a $KMnO_4$ solution for complete oxidation under acidic conditions. Calculate the normality of $KMnO_4$ solution for complete oxidation under acidic conditions. Calculate the normality of $KMnO_4$ solution.

A. 0.588 N

B. 0.294 N

C. 0.882 N

D. 0.735 N

Answer: A

Watch Video Solution

11. A solution of H_2O_2 labelled as '20 V' was left open. Due to this some, H_2O_2 decomposed and volume strength of the solution decreased . To determine the new volume strength of the H_2O_2 solution, 10 mL of the solution was taken and it was diluted to 100 mL . 10 mL of this diluted solution was titrated against 25 mL of 0.0245 M $KMnO_4$ solution under acidic condition. Calculate the volume strength of the H_2O_2 solution .

A. 15.00 V

B. 17.15 V

C. 20.00 V

D. 12.30 V

Answer: B

Watch Video Solution

12. If amixture of Na_2CO_3 and NaOH in equimolar quantities when reacts with 0.1 M HCl in presence of phenolphthalein indicator consumes 30 ml

of the acid. What will be the volume (in mL) of 0.15 M H_2SO_4 used in the separate titration of same mixture in presence of methyl orange indicator.

Watch Video Solution

Part Iv

1. Volume $V_1 mL$ of 0.1 M $K_2Cr_2O_7$ is needed for complete oxidation of 0.678g N_2H_4 in acidic medium. The volume of 0.3M $KMnO_4$ needed for same oxidation in acidic medium will be :

A. $\frac{2}{5}V_1$

B. $\frac{5}{2}V_1$

C. $113V_1$

D. can not be determined

Answer: A

Watch Video Solution

Watch Video Solution

2. $Hg_5(IO_6)_2$ oxidizes KI to I_2 in acid medium and the other product containing iodine is K_2HgI_4 . If the I_2 liberated in the number of moles of $Hg_5(IO_6)_2$ that have reacted is :

A. 10^{-3}

B. 10^{-4}

C. 2.5×10^{-4}

D. 2.5×10^{-2}

Answer: C

Watch Video Solution

3. 10 mL of 1 NHCl is mixed with 20 mL of $1MH_2SO_4$ and 30 mL of 1M NaOH. The resultant solution has:

A. 20 meq of H^+ ions

B. 20 meq of OH^-

C. 0 meq of H^+ or OH^-

D. 30 milli moles of OH^-

Answer: A

Watch Video Solution

4. $20mlofH_2O_2$ after acidification with dilute H_2SO_4required 30mlof $\frac{N}{12}KMnO_4$ for complete oxidation. The approximate strength of H_2O_2 solution (ing/L)is : [Molar mass of $H_2O_2 = 34$]

A. 2 g/L

B. 4 g/L

C. 8 g/L

D. 6 g/L

Answer: A

Watch Video Solution

5. x gram of pure As_2S_3 is completely oxididsed to respective highest oxidation states by 50 ml of 0.1 M hot acidified $KMnO_4$, then mass of As_2S_3 taken is :

A. 22.4 g

B. 43.92 g

C. 64.23 g

D. None of these

Answer: D

Watch Video Solution

6. During the titration of a mixture of Na_2CO_3 and $NaHCO_3$ against HCl :

A. Phenolphthalein is used to detect the first end point

B. Phenolphthalein is used to detect the second end point

C. Methyl orange is used to detect the first end point

D. Phenolphthalein is used to detect the first and second end point

Answer: A

Watch Video Solution

7. In the reaction $CrO_5 + H_2SO_4 \rightarrow Cr_2(sO_4)_3 + H_2O + O_2$, one mole of CrO_5 will liberate how many molesof O_2 :

A. $5/2$

B. $5/4$

C. $9/2$

D. $7/4$

Answer: D

Watch Video Solution

8. Consider the redox reaction

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

A. $S_2O_3^{2-}$ gets reduced to $S_4O_6^{2-}$

B. $S_2O_3^{2-0}$ gets oxidised to $S_4O_6^{2-}$

C. I_2 gets reduced to I^-

D. I_2 gets oxidised to I^-

Answer: B::C

Watch Video Solution

9. Which of the following relations is/are correct for solutions ?

A. 3 N $Al_2(SO_4)_3 = 0.5MAl_2(SO_4)_3$

B. $3NH_2SO_4 = 6NH_2SO_4$

C. $1MH_3PO_4 = 1/3NH_3PO_4$

D. $1MAl_2(SO_4)_3 = 6NAl(SO_4)_3$

Answer: A::B::D

Watch Video Solution

10. Which of the following statements is/are correct :

A. 0.2 moles of $KMnO_4$ will oxidise one mole of ferrous ions to ferric ions in acidic medium.

B. 1.5 moles of $KMnO_4$ will oxidise 1 mole of ferrous oxalate to one mole of ferric ion and carbon dioxide in acidic medium in acidic medium.

C. 0.6 moles of $KMnO_4$ will oxidise 1 mole of ferrous oxalate to one mole of ferric ion and carbon dioxide in acidic medium.

D. 1 mole of $K_2Cr_2O_7$ will oxidise 2 mole of ferrous oxalate to ferric ions and carbon dioxide in acidic medium.

Answer: A::C::D

Watch Video Solution

11. $H_2C_2O_4$ and $NaHC_2O_4$ behave as acids as well as reducing agents. Which are the correct statements?

A. equivalent weight of $H_2C_2O_4$ and $NaHC_2O_4$ are equal to their molecular weights when behaving as reducing agents.

B. 100 ml of 1 (N) solution of each is neutralised by equal volume of 1 (M)$Ca(OH)_2$

C. 100 ml of (N) solution $H_2C_2O_4$ is neutralised by equal volumes of 1 (N) $Ca(OH)_2$

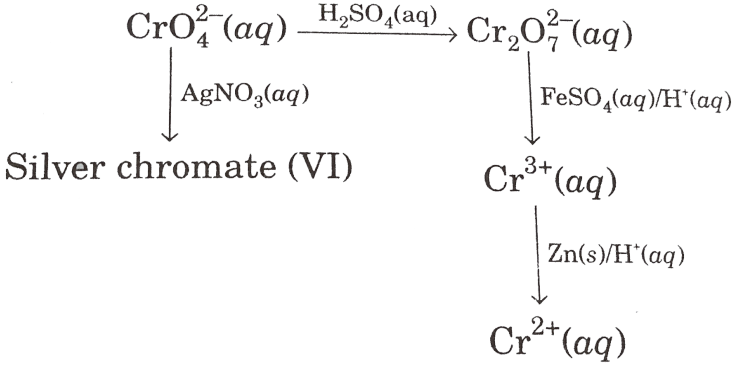
D. 100 ml of (M) solution of each is oxidised by same volume of 1 (M)

$KMnO_4$

Answer: C::D

Watch Video Solution

12. Consider the reactions shown below :



Which of the follwoing statements is false?

A. Silver chromate (VI) has the formula Ag_2CrO_4.

B. The minimum mass of zinc required to reduce 0.1 mole of Cr^{3+} to Cr^{2+} is 6.54g.

C. The conversion of CrO_4^{2-} into $Cr_2O_7^{2-}$ is not a redox reaction.

D. The equation $Cr_2O_7^{2-} + 14H^+ + 6Fe^{2+} \rightarrow 2Cr^{3+} + 7H_2O$ correctly describes the reduction of $Cr_2O_7^{2-}$ by acidified $FeSO_4$.

Answer: A::C::D

Watch Video Solution

13. A 3 mole mixture of $FeSO_4$ and $Fe_2(SO_4)_3$ required 100 mL of 2M $KMnO_4$ solution in acidic medium. Find the mole of $FeSO_4$ in the mixture.

Watch Video Solution

14. A 7.1 g sample of bleaching powder suspended in H_2O was treated with enough acetic acid and KI solution. Iodine thus liberated required 80 mL of 0.2 N hypo solution for titration. Calcutale the % of available chlorine :

Watch Video Solution

15. If the number of N-atoms in 1 molecule of Hyponitrous acid is x and the basicity of Boric acid is y, fing the sum (x+y).

Watch Video Solution

16. Find the valency factor (n) for NH_2OH in given reaction :

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

Watch Video Solution

17. A solution of $Na_2S_2O_3$ is standardised iodometrically against 3.34 g of pure $KBrO_3$ (converted to Br^-), requiring 40 mL $Na_2S_2O_3$ solution. What is the molarity of $Na_2S_2O_3$ solution ? (Molar mass of $KBrO_3 = 167 g \text{mol}^{-1}$)

View Text Solution

18. 2 moles of a mixture of O_2 and O_3 is reacted with excess of acidified solution of KI. The iodine liberated require 1L of 2M hypo solution for complete reaction. The weight % of O_3 in the initial sample is x. Find $\frac{x}{10}$

Watch Video Solution

19. The overall equation for the reaction between sodium carbonate solution and dilute hydrochloric acid is

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

If you had the two solutions of the same concentration, you would have to use double volume of HCl to reach the equivalence point.

Indicators change their colours at the end point of the reaction and hence we are able to know the end points (equivalence points of reactions).

How many ml of 1N HCl are required for X milimoles of Na_2CO_3 with methyl orange indicator

A. X ml

B. 2 X ml

C. 3 X ml

D. 4 X ml

Answer: B

View Text Solution

20. The overall equation for the reaction between sodium carbonate solution and dilute hydrochloric acid is

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

If you had the two solutions of the same concentration, you would have to use double volume of HCl to reach the equivalence point.

Indicators change their colours at the end point of the reaction and hence we are able to know the end points (equivalence points of reactions).

How many ml of 1N HCl are required for X milimoles of NaOH + Y

milimoles of $Na_2CO_3 + Z$ milimoles of $NaHCO_3$with methyl orange indicator

A. (2X+Y+Z)ml

B. (X+2Y+2Z)ml

C. (X+2Y+3Z)ml

D. (X+2y+Z) ml

Answer: D

View Text Solution

21. The overall equation for the reaction between sodium carbonate solution and dilute hydrochloric acid is

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

If you had the two solutions of the same concentration, you would have to use double volume of HCl to reach the equivalence point.

Indicators change their colours at the end point of the reaction and hence we are able to know the end points (equivalence points of

reactions).

25 ml of Na_2CO_3 solution requires 100 ml of 0.1 M HCl to reach end point with phenolphthalein indicator. Molarity of HCO_3^- ions in the resulting solution is

A. 0.008 M

B. 0.04M

C. 0.16 M

D. 0.08M

Answer: D

View Text Solution

22.

	List-I		List-II
(A)	Sn^{+2} + MnO_4 (acidic) 3.5 mole 1.2 mole	(p)	Amount of oxidant available decides the number of electrons transfer
(B)	$H_2C_2O_4$ + MnO_4^- (acidic) 8.4 mole 3.6 mole	(q)	Amount of reductant available decides the number of electrons transfer
(C)	$S_2O_3^{-2}$ + I_2 7.2 mole 3.6 mole	(r)	Number of electrons involved per mole of oxidant > Number of electrons involved per mole of reductant
(D)	Fe^{+2} + $Cr_2O_7^{-2}$ (acidic) 9.2 mole 1.6 mole	(s)	Number of electrons involved per mole of oxidant < Number of electrons involved per mole of reductant.

View Text Solution