CHEMISTRY

BOOKS - DISHA PUBLICATION CHEMISTRY (HINGLISH)

CHAPTERWISE NUMERIC/INTEGER ANSWER QUESTIONS

Chapter 1 Some Basic Concepts Of Chemistry

1. What is the mass of water (in g) produced from 445 g of $C_{57}H_{110}O_6$ in the following reaction?

$2C_{57}H_{110}O_6(s) + 163O_2(g) \rightarrow 114CO_2(g) + 110H_2O(l)$

Watch Video Solution

2. The amount of suga $(C_{12}H_{22}O_{11})$ required to prepare 2L of its 0.1 M aqueous solution is

Watch Video Solution

3. 5 moles of AB_2 weigh 125×10^{-3} kg and 10 moles of A_2B_2 weigh 300×10^{-3} kg. What is the sum of molar mass of A (M_A) and molar mass of $B(M_B)$ in $g\text{mol}^{-1}$?

Watch Video Solution

4. 5.0 g of a certain element X forms 10.0 g of its oxide having the formula X_4O_6. What is the atomic mass of X

Watch Video Solution

5. A 100% pure sample of a divalent metal carbonate weighing 2g on complete thermal decomposition releases $44gcc$ of carbon dioxide at STP. The equivalent mass of the metal is

Watch Video Solution

6. The specific heat of a metal is 0.16 cal g_1. The equivalent mass of the metal is 20.04. What is the correct atomic mass of the metal in grams?

Watch Video Solution

7. 1.500g of hydroxide of a metal gave 1.000g of its oxide on heating. What is the equivalent mass of the metal ?

View Text Solution

8. Limestone ($CaCO_3$) decomposes into quicklime (CaO) on strong heating. How much quantity of limestone will be required to prepare 100 kg of quicklime?

Watch Video Solution

9. 1 mole of mixture of CO and CO_2 requires exactly 28 g KOH in solution for complete conversion of all the CO_2 into K_2CO_3. How much amount more of KOH will be required for conversion into K_2CO_3 ? If one mole of mixture is completely oxidised to CO_2.

Watch Video Solution

10. 1 mol of N_2 and 4 mol of H_2 are allowed to react in a sealed container and after the reaction some water is introduced in it. The aqueous solution formed required 1 L of 1 M HCl for neutralization. Calculate the mole fraction of the gaseous product in the mixture after the reaction.

Watch Video Solution

11. 6.2 g of a sample containing $NaHCO_3$, $NaHCO_3$ and non -volatiale inert impurity on gentle heating loses 5% of its mass due to reaction $2NaHCO_3 \rightarrow Na_2CO_3 + H_2O + CO_2$. Residue is dissolved in water and formed 100 mL solution and its 10 mL portion requires 7.5 mL of 0.2

M aqueous solution of $BaCl_2$ for complete precipitation of carbonates.

Determine mass (in gram) of Na_2CO_3 in the original sample .

Watch Video Solution

12. $H_2O_2 + 2KI \xrightarrow{40\,\%\text{ yield}} I_2 + 2KOH$

$H_2O_2 + 2KMnO_4 + 3H_2SO_4 \xrightarrow{50\,\%\text{ yield}} K_2SO_4 + 2MnSO_4 + 3O_2 + 4H_2O$

150mL of H_2O_2 sample was divided into two parts. First part was treated with KI and formed KOH required 200 mL of $M/2H_2SO_4$ for neutralisation. Other part was treated with $KMnO_4$ yielding 6.74 litre of O_2 at 1 atm. and 273 K. Using % yield indicated find volume strength of H_2O_2 sample used.

Watch Video Solution

13. 5 g sample contain only Na_2CO_3 and Na_2SO_4 This sample is dissolved and the volume made up to 500 mL. 25 mL of this solution

neutralizes 20 mL of 0.1 M H_2SO_4. Calculate the percentage of Na_2SO_4 in the sample.

View Text Solution

14. A mixture of FeO and Fe_2O_3 is completely reacted with 100 mL of 0.25 M acidified $KMnO_4$ solution. The resultant solution was then treated with Zn dust which converted Fe^{3+} of the solution to Fe^{2+}.The Fe^{2+} required 1000 mL of 0.10 $MK_2Cr_2O_7$ solution. Find out the weight % Fe_2O_3 in the mixture.

Watch Video Solution

15. An impure sample of sodium oxalate $(Na_2C_2O_4$ weighing 0.20 g is dissolved in aqueous solution of $H_2SO_{94})$ and solution is titrated at $70^\circ C$,requiring 45 mL of 0.02 M $KMnO_4$ solution. The end point is overrun, and back titration in carried out with 10 mL of 0.1 M oxalic acid solution.Find the purity of $Na_2C_2O_4$ in sample:

Watch Video Solution

Chapter 2 Structure Of Atom

1. The ground state energy of hydrogen atom is $-13.6eV$. The energy of second excited state of He^+ ion in eV is

Watch Video Solution

2. what is the work fuction of the metal if the light of wavelength 4000Å generates photoelectrons of velocity $6 \times 10^5 ms^{-1}$ from it ?

(Mass o felectron $= 9 \times 10^{-31}$kg

Velocity of light $= 3 \times 10^8 ms^{-1}$

Planck's constant $= 6.626 \times 10^{-34} Js$

Charge of electron $= 1.6 \times 10^{-19} jeV^{-1}$

Watch Video Solution

3. Monochromatic radiation of specific wavelength is incident on H-atoms in ground state. H-atoms absorb energy and emit subsequently radiations of six different wavelength. Find wavelength of incident radiations:

Watch Video Solution

4. In a measurement of quantum efficiency of photosynthesis in green plants, it was found that 10 quanta of red light of wavelength 6850 Å were needed to release one molecule of O_2. The average energy storage in this process for 1 mol O_2 evolved is 112 Kcal.

What is the energy conversion efficieny in this experiment?

Given: 1 cal =4.18 J, $N_A = 6 \times 10^{23}$, $h = 6.63 \times 10^{-34}$ J.s

Watch Video Solution

5. The given diagram indicates the energy levels of certain atoms. When ihe system moves from 2E level to F. a photon of wave length λ is emitted.

Calculate the wave-length of photon produced during its transition from $\frac{4E}{3}$ level to E in terms of λ

View Text Solution

6. An element undergoes a reaction as shown $sx + 2e^{-} \rightarrow x^{-2}$

Energy released $= 30.87$ ev/atom. If the energy released is used to dissociated $4g$ to H_2 molecules equally into H^{+} and H^{+} is excited state of H atoms where the electron travels in orbit whose circumference equal to four times its de -roglie's wavelength. Determine the minimum number of moles of x that would be required.

Given IE of $H = 13.6$ ev/atom, bond energy of $H_2 = 4.526$v/molecule

Watch Video Solution

7. Two fast moving particles X and Y are associated with de Broglie wavelengths 1 nm and 4 nm respectively. If mass of X is nine times the

mass of Y, then calculate ratio of kinetic energies of X and Y.

Watch Video Solution

8. An electron has a speed of 30,000 cm $\sec^{-1}$ accurate upto 0.001%. What is the uncertainty (in cm) in locating it's position?

Watch Video Solution

9. What is the sum of radial and angular nodes in the following orbitals of H-atom?

(I) Ψ_{2px}, (ii) Ψ_{2s}, (iii) Ψ_{3d_x}, (iv) $\Psi_{3d_{x^2-y^2}}$

Watch Video Solution

10. Determine the Bohr orbit of Li^{2+} ion in which electron is moving at speed equal to the speed of electron in the first Bohr orbit of H-atom

Watch Video Solution

11. A certain day absorbs lights of $\lambda = 400$ nm and then fluorescence light of wavelength 500 mn. Assuming that under given condition $40\,\%$ of the absorbed energy is re-emitted as fluorescence, calculate the ratio of quanta obserbed to number of quanta emitted out.

Watch Video Solution

12. Infrared lamps are used in restaurants to keep the food warm. The infrared radiation is strongly absorbed by water, raising its temperature and that of the food. If the wavelength of infrared radiationis assumed to be 1500 nm, and the number of quanta of infrared radiation produced per second by an infrared lamp (that consumes enregy at the rate of 100 W and is $12\,\%$ effcient only) is $\left(\times 10^{19}$, then the value of x is :

$\left(Given: h = 6.665 \times 10^{-34} J - s\right)$

Watch Video Solution

13. When an electron makes transition from $(n+1)$state to n state the wavelength of emitted radiations is related to n $(n>>>1)$ according to $\lambda \propto n^x$.

What is the value of x ?

Watch Video Solution

14. A gas absorbs a photon of $355nm$ and emits at two wavelengths . If one of the emission is at 680 nm , the other is at :

Watch Video Solution

15. Calculate the minimum potential (eV) which must be applied to a fr ee electron so that it has enough energy to excite, upon impact, the electron in a hydrogen atom from its ground state to a state of n = 5.

View Text Solution

1. The boiling point of Kr and Rn are -152°C and -62°C respectively. Find the approximate boiling point o fXe.

Watch Video Solution

2. How much energy in joules must be needed to convert all the atoms of sodium to sodium ions present in 2.3 mg of sodium vapours ?

Given : Ionisation energy of sodium is 495 kJ mol^{-1}

View Text Solution

3. The ionization energy of lithium is 520 kJ mol^{-1} . Find the amount of energy (in kJ) required to convert 70 mg of lithium atoms in gaseous state into Li+ ions.

View Text Solution

4. The electron affinity of bromine (g) is 3.9 eV. How much energy in kJ is released when 10.0 g of bromine is converted completely to Br- in gaseous state?

[Given. Atomic mass of Br = 80, 1 eV = 96.3 kJ mol^{-1}].

Watch Video Solution

5. How many pairs are, in which first species has lower ionisation enegy than second species:

(i) N and O

(ii) Br and K

(iii) Be and B

(iv) I and I^-

(V) Li and Li^+

(vi) and O and S

(vii) Ba and Sr.

Watch Video Solution

6. How many elements of the following are electropositive element(s)?

Sodium, calcium, germanium and polonium and chlorine.

Watch Video Solution

7. An element 'X' has its electronic configuration of 'K' shell is $(n-5)s^2$ and it has total number of electrons in its outermost, penultimate and antipenultimate shell are 2,8 and 25 respectively then find out total number of unpaired electrons in element 'X' in their ground state.

Watch Video Solution

8. Total number of element(s) which have only single oxidation state (other than zero) in their corresponding stable compounds: Cs, Ba, F, Zn,Be,Al, Sr,Ga, Pb.

Watch Video Solution

9. Consider the following order:

(i) $HF > HCl > HBr > HI$: Lewis basic character

(ii) $CH_4 < CCl_4 < CF_4$: Electronegatively of central 'C'- atom

(iii) $Mg^{2+} < K^{+} < S^{2-} < Se^{2+}$ Stable oxidation state

(vi) $LiF > NaF > KF > RbF$, Lattice energy

(vii) $F^{-}(aq) > Cl^{-}(aq) > Br^{-}(aq) > I^{-}(aq)$, Electrical conductance

(viii) $Li^{+} < Mg^{2+} < Al^{3+}$: Hydration energy

(ix) $Cl > Br > F > I$: Electron affinity

(x) $BeCl_2 < AlCl_3 < SiCl_4$: Lewis acidic character

Then calculate value of (x-y), where x and y are correct and incorrect order respectively.

View Text Solution

10. Among the following, the number of elements showing only one non-zero oxidation state is:

O,Cl,F,N,P,Sn,Tl,Na,Ti

Watch Video Solution

Chapter 4 Chemical Bonding And Molecular Structure

1. A diatomic molecule has dipole moment of $1.2D$. If the bond distance is 1Å what parcentage of covalent in the molecule is

Watch Video Solution

2. The dipole moments of a diatomic molecule AB is10.4D and bond distance is $2.82A^{\circ}$, calculate the $\%$ ionic character ofAB

Watch Video Solution

3. Bond angle between two hybrid orbitals is 105° Percentage of s-orbital character of hybrid orbital is between

Watch Video Solution

4. In O_2^-, O_2 and O_2^{-2} molecular species, the total number of antibonding electrons respectively are

Watch Video Solution

5. There are two groups of compounds A and B. Groups A contains three compounds Px_4, Qy_3, Rz_2. Groups B also contains three compounds Sx_4, Ty_3, Uz_2. Hybridization of each central atom of group A compounds is same as that of iodine in $IBrCl^-$ while in group B compounds it is same as that of iodine $IBrCl^+$. Substituents X, Y and Z exhibit covalency of one in ground state. Then find the value of x/y.

Where, x and y are total number of lone pair present at central atoms of compounds of group A and B respectively.

Watch Video Solution

6. Consider the following three compounds $(i)AX_{2n}^{n-}$, (ii)AX_{3n} and (ii) AX_{4n}^{n+}, where central atom A is 15th group element and their maximum

covalency is 3n. If total number of proton in surrounding atom X is n and value of n is one, then calculate value of $x^3 + y^2 + z^2$. (where x, y and z are total number of lone pair at central atom in compounds (i), (ii) and (iii) respectively.

Watch Video Solution

7. Calculate the value of " x+y-z" here x,y and z are total number of non-bonded electron pair (s),pie (π) bond(s) and sigma (σ) bonds in hydrogen phosphite ion respectively.

Watch Video Solution

8. Consider the following compounds :

$(i) IF_5$ $(ii) ClI_4^-$ $(iii) XeO_2F_2$ $(iv) NH_2^-$

$(v) BCl_3$ $(vi) BeCl_2$ $(vii) AsCl_4^+$ $(viii) B(OH)_3$

(ix) NO_2^- $(x) ClO_2^+$

Then calculate value of "x+y-z", here, x,y and z are total number of compounds in given compounds in which central atom used their all

three p-orbitals, only two p-orbitals and only one p-orbital in hybridisation respectively .

Watch Video Solution

9. Total number of species which used all three p-orbitals in hybridisation of central atom and should be non-polar also.

$XeO_2F_2, SnCl_2, IF_5, I_3^+, XeO_4, SO_2, XeF_7^+, SeF_4$

Watch Video Solution

10. Consider the following orbitals $3s, 2p_x, 4d_{xy}, 4d_{z^2}, 3d_{x^2-y^2}, 3p_y, 4s, 4p_z$ and find total number of orbital (s) having even number of nodal plane.

Watch Video Solution

11. For the following molecules :

$PCl_5, BrF_3, ICl_2^-, XeF_5^-, NO_3^-, XeO_2F_2, PCl_4^+, CH_3^+$

Calculate the value of $\frac{a+b}{c}$

a = Number of species having sp^3 d-hybridisation

b= Number of species which are planar

c= Number of species which are non-planar

Watch Video Solution

12. Find total number of orbital which can overlap colaterally, (if inter nuclear axis is z):

$s, p_x, p_y, p_z, d_{xy}, d_{yz}, d_{xz}, d_z, d_{x^2-y^2}$

View Text Solution

13. The total number of lone-pairs of electrons in melamine is.

Watch Video Solution

14. Among the triatomic molecules/ions $BeCl_2, N_3^-, N_2O, NO_2^+, O_3, SCl_2, lCl_2^-, l_3^-$ and XeF_2, the total number of linear molecules (s)/ion(s) where the hybridisation of the central atom does not have contribution from the d- orbitals (s) is [atomic number of $S = 16, Cl = 17, I = 53$ and $Xe = 54$]

Watch Video Solution

15. The sum of the number of lone pair of electrons on each central atom in the following species is

$[TeBr_6]^{2-}, [BrF_2]^{2+}, SNF_3,$ and $[XeF_3]^-$

(Atomic number : N = 7, F = 9, S = 16, Br = 35, Te = 52, Xe = 54)

Watch Video Solution

1. $20dm^3$ of SO_2 diffuse through a porous partitions in 60 second What volume be O_2 will diffuse under similar conditions in 30 second ? .

Watch Video Solution

2. 4.5 g of PCl_5 on vapourisation occupied a volume of 1700mL at atmosphere pressure and 227°C temperature. Calculate it: degree of dissociation.

View Text Solution

3. A spherical balloon of 21 cm diameter is to be filled up with hydrogen at 1 atm, 273 K from a cylinder containing the gas at 20 atm and $27^\circ C$. If the cylinder can hold 2.82 litre of water, calculate the number of balloons that can be filled up completely.

Watch Video Solution

4. At $27^{\circ}C$, hydrogen is leaked through a tiny hole into a vessel for $20\ \text{min}$. Another unknown gas at the same temperature and pressure as that of hydrogen is leaked through the same hole for $20\ \text{min}$. After the effusion of the gases, the mixture exerts a pressure of $6atm$. The hydrogen content of the mixture is $0.7mol$. If the volume of the container is $3L$, what is the molecular weight of the unknown gas?

Watch Video Solution

5. A bubble of gas released at the bottom of a lake increases to four times its original volume when it reaches the surface. Assuming that atmospheric pressure is equivalent to the pressure exerted by a column of water 10 m high, what is the depth of the lake?

Watch Video Solution

6. A mixture of $NH_{3(g)}$ and $N_2H_{4_{(g)}}$ is placed in a sealed container at $300K$. The total pressure is $0.5atm$. The container is heated to $1200K$, at

which time both substances decompose completely according to the equations:

$2NH_{3(g)} \rightarrow N_{2(g)} + 3H_{2(g)}$

$N_2H_{4_{(g)}} \rightarrow N_{2(g)} + 2H_{2(g)}$

After decomposition is complete, the total pressure at $1200K$ is found to be $4.5atm$. Find the amount (mole) per cent of $N_2H_{4(g)}$ in the original mixture.

Watch Video Solution

7. If 250 mL of N_2 over water at $30^\circ C$ and a total pressure of 740 torr is mixed with 300 mL of Ne over water at $25^\circ C$ and a total pressure of 780 torr, what will be the total pressure if the mixture is in a 500 mL vessel over water at $35^\circ C$.

(Given : Vapour pressure (Aqueous tension)of H_2O at $25^\circ C$ and $35^\circ C$ are 23.8, 31.8 and 42.2 torr respectively. Assume volume of $H_2O(l)$ is negligible in final vessel)

Watch Video Solution

8. At 300 K, the density of a certain gaseous molecule at 2 bar is double to that of dinitrogen (N_2) at 4 bar. The molar mass of gaseous molecule is:

Watch Video Solution

9. Calculate the total pressure (in atm) in a 10.0 L cylinder which contains 0.4 g helium, 1.6 g oxygen and 1.4 g nitrogen at 27 ºC.

Watch Video Solution

10. At STP, a container has 1 mole of He, 2 mole Ne, 3 mole O_2 and 4 mole N_2 without changing total pressure if 2 mole of O_2 is removed. Calculate the percentage decrease in the partial pressure of O_2

Watch Video Solution

11. A gaseous mixture contains three gaseous A, B and C with a total number of moles of 10 and total pressure of $10 atm$. The partial pressure of A and B are $3 atm$ and 1 atm respectively and if C has molecular weight of $2 g / mol$. Then, the weight of C present in the mixture will be :

Watch Video Solution

12. Two flask A and B of equal volumes maintained at temperature $300 K$ and $700 K$ contain equal mass of $He(g)$ and $N_2(g)$ respectively. What is the ratio of total translational kinetic energy of gas in flask A to that of flask B ?

Watch Video Solution

13. If one mole of a monoatomic gas $(\gamma = 5/3)$ is mixed with one mole of a diatomic gas $(\gamma = 7/5)$ the value of γ for the mixture is .

Watch Video Solution

14. A mixture of Ne and Ar kept in a closed vessel at 250 K has a total K.E.=3 kJ. The total mass of Ne and Ar is 30 g. Find mass % of Ne in gaseous mixture at 250 K.

Watch Video Solution

15. What is the compressibility factor (Z) for 0.02 mole of a van der Waals's gas at pressure of 0.1 atm. Assume the size of gas molecules is negligible.

Given : RT=20 L atm mol^{-1} and a=1000 atm $L^2 mol^{-2}$

Watch Video Solution

Chapter 6 Thermodynamics

1. A gas present in a cylinder fitted with a frictionless pistion expands against a constant pressure of $1atm$ form a volume of $2L$ to a volume of

$6L$. In doing so, it absorbs $800J$ heat form the surroundings. Determine the increases in internal enegry of process.

Watch Video Solution

2. The heat of neutralisation of strong base and strong acid is 57.0 kJ. Calculate the heat released when 0.5 mole of HNO_3 is added to 0.20 mole of NaOH solution.

Watch Video Solution

3. 

Based on data provided, find the value of electron gain enthalpy of fluorine.

View Text Solution

4. The standard enthalpy of formation of NH_3 is $-46.0KJmol^{-1}$. If the enthalpy of formation of H_2 from its atoms is $-436KJmol^{-1}$ and that of N_2 is $-712KJmol^{-1}$, the average bond enthalpy of $N-H$ bond in NH_3 is

Watch Video Solution

5. The enthalpy of neutralisation of a weak acid in 1 M solution with a strong base is -56.1 kJ mol^{-1}/ If the enthalpy of ionization of the acid is 1.5 kJ mol^{-1} and enthalpy of neutralization of the strong acid with a strong base is -57.3 kJ equiv^{-1}, what is the % ionization of the weak acid in molar solution (assume the acid to be monobasic)?

Watch Video Solution

6. The heat of sublimation of iodine is 24 cal g^{-1} at 50°C. If specific heat of solid iodine and its vapour are 0.055 and 0.031 cal g^{-1} respectively Calculate the heat of sublimation of iodine at 100°C.

View Text Solution

7. When 0.2 mole of anhydrous $CuSO_4$ is dissolved in water, the heat evolved is 1.451 kcal. If 0.2moleof $CuSO_4.5H_2O$ is dissolved in water, the heat absorbed is 0.264 kcal. Calculate the molar heat of hydration of $CuSO_4$

Watch Video Solution

8. The specific heat of a monoatomic gas at constant pressure is 248.2 J $kg^{-1}K^{-1}$ and at constant volume it is 149.0 J $kg^{-1}K^{-1}$. Find the mean molar mass of the gas.

Watch Video Solution

9. The standard entropies of $CO_{2(g)}$, $C_{(s)}$, and $O_{2(g)}$ are 213.5, 5.740 and 205 JK^{-1} respectively. The standard entropy of formation of CO_2 is _____.

Watch Video Solution

10. Titanium metal is extensively used in aerospace industry because the metal imparts strength to structures but does not unduly add to their masses. The metal is produced by the reduction of $TiCl_{4(l)}$ which in turn is produced from mineral rutile $\left[TiO_{2(s)}\right]$. can the following reaction for production of $TiCl_{4(l)}$ be carried out at $25^{\circ}C$?

$TiO_{2(s)} + 2Cl_{2(g)} \rightarrow TiCl_{4(l)} + O_{2(g)}$

Given that H_f° for $TiO_{2(s)}, TiCl_{4(l)}, Cl_{2(g)}$ and $O_{2(g)}$ are $-944.7, -804.2, 0.0, 0.0 kJmol^{-1}$. also S° for $TiO_{2(g)}, TiCl_{4(l)}, Cl_{2(g)}$ and $O_{2(g)}$ are $50.3, 252.3, 233.0, 205.1 Jmol^{-1}K^{-1}$ respectively.

Watch Video Solution

11. One mole of CH_3COOH undergo dimerization in vapour state at $127^{\circ}C$ as $2CH_3COOH(g) \Leftrightarrow (CH_3COOH)_2$ if dimer formation is due

to two H-bonds involved in dimer, each of 33kJ strenght and the degree of dimerization of acetic acid $98.2\,\%$ which is correct

Watch Video Solution

12. The factor of ΔG values is important in metallurgy. The ΔG values for the following reactions at 800°C are given as :

$S_2(s) + 2O_2(g) \rightarrow 2SO_2(g), \Delta G = -544kJ$

$2Zn(s) + S_2(s) \rightarrow 2ZnS(s), \Delta G = -293$ kJ

$2Zn(s) + O_2(g) \rightarrow 2ZnO(s), \Delta G = -480$ kJ

Calculate the ΔG for the reaction:

$2ZnS(s) + 3O_2(g) \rightarrow 2ZnO(s) + 2SO_2(g)$

Watch Video Solution

13. For vaporization of water at 1 atmospheric pressure, the values of ΔH and ΔS are 40.63kJ mol^{-1} and $108.8\text{JK}^{-1}mol^{-1}$ respectively. The temperature when Gibbs energy change (ΔG) for this transformation will be zero , is :

Watch Video Solution

14. An ideal gas is allowed to expand from 1 L to 10 L against a constant external pressure of 1 bar. Calculate the work done inkJ.

Watch Video Solution

15. During compression of a spring the work done is 10 kJ and 2 kJ escaped to the surroundings as heat. The change in internal energy, ΔU (in kJ) is _____ .

Watch Video Solution

Chapter 7 Equilibrium

1. Equilibrium constant K_p for the reaction:

`CaCO_(3)(s) If 1 mole of $CaCO_3$ is placed in a closed container of 20L and

heated to this temperature, what amount of $CaCO_3$ in grams would dissociate at equilibrium ?

View Text Solution

2. An amount of solid NH_4HS is placed in a flask already containing ammonia gas at a certain temperature and 1.0 atm pressure. Ammonium hydrogen sulphide decomposes to yield NH_3 and H_2S gases in the flask. When the decomposition reaction reaches equilibrium, the total pressure in the flask rises to 2 atm. What will be the equilibrium constant for NH_4HS decomposition at this temperature?

View Text Solution

3. Calculate the pH of a solution obtained by diluting 1 mL of 0.10 M weak monoacidic base to 100 mL at constant temperature if Kb of the base is 1×10^{-5}.

Watch Video Solution

4. 28 g N2 and 6.0 g of H_2 are heated over catalyst in a closed one litre flask of 450 °C. The entire equilibrium mixture required 500 mL of 1.0 M H_2SO_4 for neutralisation. Calculate the value of Kc in $L^2\text{mol}^2$ for the given reaction.

$N_2(g) + 3H_2(g) \rightarrow 2NH_3(g)$

View Text Solution

5. The equilibrium constant of the reaction of weak acid HA with strong base is 10^{-7} Find the pOH of the aqueous solution of 0.1M NaA.

View Text Solution

6. For the reaction $C(s) + CO_2(g) \rightarrow 2CO(g)$, $k_p = 63$ atm at 100 K. If at equilibrium $p_{CO} = 10p_{CO_2}$ then the total pressure of the gases at equilibrium is

Watch Video Solution

7. The pK_a of HCOOH is 3.8 and pK_b of NH_3 is 4.8, find the pH of aqueous solution of 1M $HCOONH_4$.

Watch Video Solution

8. In the reaction $AB(g) \Leftrightarrow A(g) + B(g)$ at $30^\circ C, k_p$ for the dissociation equilibrium is $2.56 \times 10^{-2} atm$. If the total pressure at equilibrium is 1 atm, then the percentage dissociation of AB is

Watch Video Solution

9. Calculate the pH at the equivalence point when a solution of 0.01 M CH_3COOH is titrated with a solution of 0.01 M NaOH.pKa of CH_3COOH is 4.74

View Text Solution

10. The value of Kp for the equilibrium reaction

`N_(2)O_(4)(g)

View Text Solution

11. A buffer solution is prepared by mixing $10ml$ of $1.0M$ acetic acid & $20ml$ of $0.5M$ sodium acetate and then diluted to $100ml$ with distilled water. If the pK_a of CH_3COOH is 4.76. What is the pH of the buffer solution prepared?

Watch Video Solution

12. At a certain temperature and 2 atm pressure equilibrium constant (K_p) is 25 for the reaction

$SO_2(g) + NO_2(g) \Leftrightarrow SO_3(g) + NO(g)$

Initially if we take 2 moles of each of the four gases and 2 moles of inert gas, what would be the equilibrium pparital pressure of NO_2?

Watch Video Solution

13. Find the pH of a 2 litre solution which is 0.1 M each with respect to CH_3COOH and $(CH_3OO)_2Ba$, $\left(Ka = 1.8 \times 10^{-5}\right)$.

Watch Video Solution

14. On addition of increasing amount of $AgNO_3$(g) to 0.1 M each of NaCl and NaBr in a solution, what % of Br^- ion gets precipitated when Cl^- ion starts precipitating?

Given: K_{sp} (AgCl) = 1.0×10^{-10}, $K_{sp}(AgBr) = 1 \times 10^{-13}$.

View Text Solution

15. What can be the maximum possible molarity of Co^{2+} ions in 0.1 M HC1 saturated with $H_2S\left(K_a = 4 \times 10^{-21}\right)$? Given that K_{sp} for CoS is 2×10^{-21} and concentration of saturated $H_2S = 0.1M$

View Text Solution

Chapter 8 Redox Reactions

1. Find the sum of oxidation number of nitrogen in $(NH_4)_2SO_4$, N_2H_4 and N_2O_4.

Watch Video Solution

2. Among NH_3, HNO_3, N_2 and Mg_3N_2 , the number of molecules having nitrogen in negative oxidation state is :

Watch Video Solution

3. When $K_2Cr_2O_7$ is converted to K_2CrO_4, the change in the oxidation state of chromium is

Watch Video Solution

4. Oxidation numbers of P in PO_4^{3-}, of S in SO_4^{2-}, and that of Cr in $Cr_2O_7^{2-}$ are respectively ,

Watch Video Solution

5. In a balance equation $H_2SO_4 + xHI \rightarrow H_2S + yI_2 + zH_2O$, find the ratio of x+y, y+z

View Text Solution

6. One mole of N_2H_4 loses ten moles of electrons to form a new compound A. Assuming that all the nitrogen appears in the new compound, what is the oxidation state of nitrogen in A? (There is no change in the oxidation state of hydrogen.)

Watch Video Solution

7. 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

Watch Video Solution

8. The equivalent weight of a metal is 36. What weight of the metal would give 9.322 gm. Of its chloride ?

View Text Solution

9. Equivalent weight of $MnO_4^{\ominus}$ in acidic neutral and basic media are in ratio of:

Watch Video Solution

10. Find the number of moles of $K_2Cr_2O_7$ reduced by three mole of Sn^{2+} ions.

Watch Video Solution

11. Atomic weight of barium is 137.34 The equivalent weight of barium is $BaCrO_4$ used an an oxidising agent in acid medium is

Watch Video Solution

12. In an experiment $50ml$ of $0.1(M)$ solution of a salt is reacted with $25ml$ of $0.1(M)$ solution of sodium sulphite. The half equation for the oxidation of sulphite ion is $SO_3^{2-}(aq) + H_2O \to SO_4^{2-}(aq) + 2H^+(aq) + 2e^-$ If the oxidation number of metal in the salt was 3, what would be the new oxidation number of metal?

Watch Video Solution

13. $N_2 + 3H_2 \rightarrow 2NH_3$ molecular weight and equivalent weight of NH_3 and N_2 are 17.03 g,14 g and Y_1, Y_2 respectively. Find the value of $(Y_1 - Y_2)$.

View Text Solution

14. 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:

Watch Video Solution

15. Find the oxidation state of Fe in $Fe_4\left[Fe(CN)_6\right]_3$.

View Text Solution

1. The molecular formula of diphenyl methane.

How many structural isomers are possible when one of the hydrogen is replaced by a chlorine atom?

View Text Solution

2. 

The positive charge of carbocation can be delocalized over how many oxygen atoms in the resonating structures?

View Text Solution

3. How many carbocations are possible for molecular formula $C_3H_5^+$?

Watch Video Solution

4. The compound (X) has molecular formula C_4H_7Cl . Find out the number ofits cyclic isomers (structural and geometrical only excluding optical isomers).

View Text Solution

5. The number of stereoisomers obtained by bromination of trans-2-butene is

Watch Video Solution

6. From the following compounds/ions, how many are electrophiles?

$CH_3^+, NH_4^+. BF_3. NH_3. NH_2 - NH_2. PC_3. PCl_3. SbCl_5. GaCl_3. AlCl_3.$

("C" atom of halide)

View Text Solution

7. How many stereocentres are possible for the given compound?

View Text Solution

8. From the gifven compound, how many are optically inactive?

View Text Solution

9. Write structural formula for all the isomeric alcohols having the molecular formula $C_4H_{10}O$.

Watch Video Solution

10. How many of the following are not ambiguous? Pentane, Neopentane, sec-Butanol, .sec-Pentanol

View Text Solution

11. Compound  is a vicinal diol. How many vicinal diols are possible with the same molecular formula.

View Text Solution

12. Which of the following compound(s) is/are optically active?

View Text Solution

13. Find the number of fractions obtained after the completion of the reaction.

View Text Solution

14. How many cyclic isomers of molecular formula C_7H_{15} can form 1 methylcyclohexan-l-olon reaction with H_2O /acetone/ Ag‘ {consider only structural isomers)?

View Text Solution

15. How many stereoisomers are possible for 1, 3-dichloro-cyclopentane?

View Text Solution

Chapter 13 Hydrocarbons

1.

Find the number of monochloro derivatives formed (excluding

stereoisomers) in the above reaction.

View Text Solution

2. Find the total number of trichloroderivatives of the compound  (excluding stereoisomers).

View Text Solution

3. How many isomers (including geometrical and optical) are possible for bromochlorocyclobutane?

View Text Solution

4. How many stereoisomers are possible for dichlorocyclobutane?

View Text Solution

5. How many enantiomeric pairs are possible in bromochlorocyclopentane?

View Text Solution

6. How many alkyl bromides would yield isopentane on reaction with Grignard reagent followed by treatment with water?

View Text Solution

7. How many free radicals can be produced during following reaction (ignoring resonating structure) ?

View Text Solution

8. 

Find the number of fractions obtained after fractional distillation of product mixture.

View Text Solution

9. 

Calculate sum of number of products formed in the reaction a, b and c.

View Text Solution

10. How many alkenes, alkynes, alkadienes can be hydrogenated to form isopentane (include all isomers)?

View Text Solution

11. The total number of cyclic isomers possible for a hydrocarbon with the molecular formula C_4H_6 is .....

Watch Video Solution

12. Write total number of hydrogen atoms on all the carbon atoms which are connected directly by a single bond to benzylic carbon (carbon connected to benzene ring) in the product

View Text Solution

13. Number ofmonochloro derivatives (excluding stereoisomers), dichloro derivatives and trichloro derivatives of cyclopentane are n_2 and n_3 Find the value of $\frac{n_1, + n_2}{n_3}$.

View Text Solution

14. 

Find the number of alkenes produced in the reaction given

View Text Solution

15. Find the total no. of alkynes that on catalytic reduction gives 3-ethyl-4 methylheptane.

View Text Solution

Chapter 15 The Solid State

1. The edge length of unit cell of a metal having molecular weight $75gmol^{-1}$ is 5Å which crystallizes in cubic lattice. If the density is $2g\hat{}(-1)$, then find the radius of metal atom $\left(N_A = 6 \times 10^{23}\right)$. Give the answer in pm.

Watch Video Solution

2. In face - centred cubic (fcc) crystal lattice, edge length is 400 pm. Find the diameter of the greatest sphere which can be fitted into the interstital void without distortion of the lattice.

Watch Video Solution

3. AB crystallizes in a body centred cubic lattice with edge length a equal to $387pm$ .The distance between two oppositely charged ions in the lattice is :

Watch Video Solution

4. If calcium crystallizes in bcc arrangement and the radius of Ca atom is 96 pm, and the volume of unit cell of Ca is $x \times 10^{-30}$ m. Find the value of x.

Watch Video Solution

5. The radii of Na+ and Cl^- ions are 100 pm and 200 pm respectively. Calculate the edge length of NaCl unit cell.

Watch Video Solution

6. CsBr has bcc like structures with edge length 4.3Å. The shortest inter ionic distance in between Cs^+ and Br^- is:

Watch Video Solution

7. A metallic crystal cystallizes into a lattice containing a sequence of layers $ABABAB\ldots$. Any packing of spheres leaves out voids in the lattice. What percentage by volume of this lattice is empty spece?

Watch Video Solution

8. A molecule $A_2B(Mw = 166.4)$ occupies triclinic lattice with $a = 5\text{Å}$, $b = 8\text{Å}$, and $c = 4\text{Å}$,. If the density of AB_2 is $5.2gcm^{-3}$, the

number of molecules present in one unit cell is

Watch Video Solution

9. Consider the bcc unit cells of the solids 1 and 2 with the position of atoms are shown below. The radius of atom B is twice that of atom A. The unit cell edge length is 50% more in solid 2 than in 1. What is the approximate packing efficiency (in %) in solid 2?

View Text Solution

10. Find the sum of number of atoms present in a simple cubic, body centered cubic and face centered cubic structure.

Watch Video Solution

11. Calculate the radius (in pm) of the largest sphere which fits properly at the centre of the edge of a body centred cubic unit cell. (Given edge length is 100 pm)

View Text Solution

12. A compound $CuCl$ has face $-$ centred cubic structure. Its density is $3.4gcm^{-3}$. What is the length of unit cell ?

Watch Video Solution

13. Molybdenum forms body-centred cubic crystals whose density is $10.3gcm^{-3}$. Calculate the edge length of the unit cell. The molar mass of Mo is $95.94g\text{mol}^{-1}$.

Watch Video Solution

14. The density of mercury is $13.6 gmL^{-1}$. Calculate the approximate diameter of an atom of mercury assuming that each atom is occupying a cube of edge length equal to the diameter of the mercury atom.

Watch Video Solution

15. In the fluorite structure if the radius ratio is $\left(\frac{\sqrt{3}}{2}-1\right)$ how many ions does each cation touch?

Watch Video Solution

Chapter 16 Solutions

1. What is the molar solubility of $Al(OH)_3$ in 0.2 M NaOH solution? Given that, solubility product of $Al(OH)_3 = 2.4 \times 10^{-2}$

Watch Video Solution

2. At room temperature, a dilute solution of urea is prepared by dissolving 0.60 g of urea in 360 g of water. If the vapour pressure of pure water at this temperature is 35 mm Hg, lowering of vapour pressure will be: (molar mass of urea $= 60 g \text{mol}^{-1}$)

Watch Video Solution

3. Molal depression constant for a solvent is $4.0 K kg \text{mol}^{-1}$ The depression in the freezing point of the solvent for $0.03 mol kg^{-1}$ solution of K_2SO_4 is: (Assume complete dissociation of the electrolyte)

Watch Video Solution

4. The osmotic pressure of a dilute solution of a compound XY in water is four times that of a solution of 0.01 M $BaCl_2$ in water. Assuming complete dissociation of the given ionic compounds in water, the concentration of XY (in $\text{mol} L^{-1}$) in solution is:

Watch Video Solution

5. Calculate the amount of sodium chloride (in g) which must be added to 1000 mL of water so that its freezing point is depressed by 0.744K. For water, K_f = 1.86 K/m. Assume density of water to be 1 g mL^{-1}.

Watch Video Solution

6. What weight of the non-volatile solute urea' $(NH_2 - CO - NH_2)$ needs to be dissolved in $100g$ of water in order to decrease the vapour pressure of water by $25\ \%$? What will be the molality of the solution?

Watch Video Solution

7. A bottle of commercial sulphuric acid $\left(d = 1.787gmL^{-1}\right)$ is 86% by weight.

a. What is molarity of the acid?

b. What volume of the acid has to be used to make $1L$ of $0.2MH_2SO_4$?

c. What is the molality of the acid?

Watch Video Solution

8. 0.5 gm of fuming H_2SO_4 (Oleum) is diluted with water. This solution is completely neutralised by 26.7 ml of 0.4 M $NaOH$ solution. Calculate the percentage of free SO_3 in the given sample. Give your answer excluding the decimal places.

Watch Video Solution

9. The vapour pressure of pure benzene at a certain temperature is $640mmHg$. A non-volatile solid weighing $2.175g$ is added to $39.0g$ of benzene. The vapour pressure of the solution is $600mmHg$. What is the molar mass of the solid substance?

Watch Video Solution

10. 0.400 g of an acid HA (mol. mass = 80) was dissolved in 100 g of water. The solution showed a depression of freezing point of 0.12 K. What will be the dissociation constant (in multiple of 10^{-3}) of the acid at about 0°C? Given K_f (water) = 1.86 K Kg mol^{-1} (Assume molarity of solution a molality)

View Text Solution

11. An element X (Atomic mass = 25) exists as X4 is benzene. 51g of saturated solution of X in benzene was added to 50.0 g of pure benzene. The resulting solution showed a depression of freezing point of 0.55 K. Find the solubility of X per 100 g of benzene. (Kf for benzene = 5.5 K kg mol^{-1}

View Text Solution

12. At $10^{\circ}C$, the osmotic pressure of urea solution is $500mm$.The solution is diluted and the temperature is raised to $25^{\circ}C$.when the

osmotic pressure is found to be $105.3mm$. Determine the extent of dilution.

Watch Video Solution

13. A mixture of two immiscible liquids nitrobenzene and water at $99^\circ C$ has a partial vapour pressure of water $733mm$ and that of nitrobenzene $27mm$. Calculate the ratio of the weights of nitrobenzene to the water in the distillate.

Watch Video Solution

14. A solution containing 28 g of phosphorus in 315 g $CS_2(b.\,p.\,46.3^\circ C)$ boils at $47.98^\circ C$. If K_b for CS_2 is 2.34 K kg mol^{-1} . The formula of phosphorus is (at , mass of P = 31).

Watch Video Solution

15. Calculate the molality of 1 litre solution of 93% $H_2SO_4(\text{weight}/\text{volume})$. The density of solution is 1.84 g mL^{-1}.

Watch Video Solution

Chapter 17 Electrochemistry

1. The equivalent conductances of sodium chloride, hydrochloric acid and sodium acetate at infinite dilution are 126.45, 426.16 and $91.0 ohm^{-1} cm^2 eq^{-1}$, respectively at $25^\circ C$. Calculate the equivalent conductance of acetic acid at infinite dilution.

Watch Video Solution

2. 2F of electricity is passed through 20 L of a solution of aquous solution of KCI. Calculate the pH of the solution.

View Text Solution

3. The specific conductivity of a solution containing 1.0 g of anhydrous $BaCl_2$ in 200 cm^3 of the solution has been found to be 0.0058 S cm^{-1}. Calculate the molar conductivity of the solution. (Molecular wt. of $BaCl_2 = 208$).

View Text Solution

4. The equivalenet conductivites of acetic acid at $298K$ at the concentration of $0.1M$ and $0.001M$ are 5.20 and $49.2Scm^2eq^{-1}$ respectively. Calculate the degree of dissociation of acetic acid at the these concentrations. Given that, $\lambda^{\propto}\left(H^+\right)$ and $\lambda^{\propto}\left(CH_3COO^-\right)$ are 349.8 and $40.9ohm^{-1}cm^2mol^{-1}$ respectively.

Watch Video Solution

5. The amount of electricity which release 2.0g of gold from a gold salt is same as that which dissolves 0.967g of copper anode during the

electrolysis of copper sulphate solution. What is the oxidation number of gold in the gold ion ? (At mass of Cu=63.5,Au=197)

Watch Video Solution

6. If K_c for the reaction

$Cu^{2+}(aq) + Sn^{2+}(aq) \rightarrow Sn^{4+}(aq) + Cu(s)$

at 25° C is represented as 2.6×10^y then find the value of y.

(Given:$E^\circ_{Cu^{2+}|Cu} = 0.34V$, $E_{Sn^{4+}|Sn^{2+}\hat{}(\circ)=0.15V}$

Watch Video Solution

7. If ΔG° for the half cell $MnO_4^- \mid MnO_2$ in an acid solution is xF then find the value of x.

(Given: $E^\circ_{MnO_4^-|Mn^{2+}} = 0.34V$, $E^\circ_{Sn^{4+}|Sn^{2+}} = 0.15V$)

Watch Video Solution

8. The standard reduction potential of a silver chloride electrode (metal - sparingly soluble salt electrode) is $0.209V$ and for silver electrode is $0.80V$. If the moles of $AgCl$ that can dissolve in $10L$ of a $0.01MNaCl$ solution is represented as 10^{-z} then find the value of z.

Watch Video Solution

9. Molar conductivity of aqueous solution of HA is 200 S $cm^2\ \mathrm{mol}^{-1}$, pH of this solution is 4. Calculate the value of $pK_a(HA)$ at 25° C

Given: $\wedge_M^\infty\ (NaA) = 100Scm^2mol^{-1}$, $\wedge_M^\infty\ (HCl) = 425Scm^2\mathrm{mol}^{-1}$, $\wedge_M^\infty\ (NaCl) = 125Scm^2\mathrm{mol}^{-1}$.

Watch Video Solution

10. If electrode potential of following cell:

$Pt_s\left|Fe_{aq}^{2+}, Fe_{aq}^{3+}\right|\left|MnO_{4(aq)}^-, Mn_{aq}^{2+}, H_{aq}^+\right|Pt_s$

is X then calculate value of 20X.

[Given: $E_{MnO_4^-|Mn^{2+}} = 1.51V$,

$E_{Fe^{3+}|Fe^{2+}}$ = 0.78 V,` (2.303 RT)/F = 0.06]

Watch Video Solution

11. A solution of $Ni(NO_3)_2$ is electrolysed between platinum electrodes using 0.1 Faraday electricity. How many mole of Ni will be deposited at the cathode?

Watch Video Solution

12. The standard Gibbs energy for the given cell reaction is $KJmol^{-1}$ at 298 K is :

$Zn(s) + CU^{2+}(aq) \rightarrow Zn^{2+}(aq) + Cu(s)$

$E^{\circ} = 2Vat298K$

(Friday's constant , $F = 96000Cmol^{-1}$)

Watch Video Solution

13. All the energy realesed from the reation $X \to Y, \Delta_r G^\circ = -193 kJ mol^{-1}$, is used for oxidizing M^+ as $M^+ \to M^{3+} + 2e^-, E^\circ = -0.25V$. Under standard consistions, the number of moles of M^+ oxidized when on e mol of X is converted to Y is $\left[F = 96,500 C \text{mol}^{-1}\right]$

Watch Video Solution

14. Consider the following half-cell reaction and associated standerd half-cell potentials and determine the maximum voltage thatr can be obtained by combination resulting in spontenous process :

$AuBr_4^-(aq) + 3e^- \to Au(s) + 4BR^-(aq), E^\circ = -086V$

$Eu^{3+}(aq) + e^- \to Eu^{2+}(aq), E^\circ = -043V$

$Sn^{2+}(aq) + 2e^- \to Sn(s), E^\circ = -0.14V$

$IO^-(aq) + H_2O(l) + 2e^- \to I^-(aq) + 2OH^-, E^\circ = +0.49V$

Watch Video Solution

15. The standard e.m.f. of the cell $Zn\left|Zn^{2+}(0.01M)\right|\ |\ Fe^{2+}(0.001M)|$ Fe at 298 K is 0.02905 then the value of equilibrium constant for the cell reaction 10^{x} . Find x.

Watch Video Solution

Chapter 18 Chemical Kinetics

1. For a chemical reaction $2X+Y\rightarrow Z$, the rate of appearance of Z is $0.05molL^{-1}\ \min^{-1}$. The rate of diappearance of X will be

Watch Video Solution

2. For the reaction at $273K$

$NO(g)+O_3(g)\rightarrow NO_2(g)+O_2(g)$

It is observed that the pressure of $NO(g)$ falls form $700mmHg$ to

$500 mm Hg$ in $250 s$. Calculate the average rate of reaction in (a) $atm s^{-1}$, (b) $mol L^{-1} s^{-1}$.

Watch Video Solution

3. For a first order reaction, calculate the ratio between the time taken to complete $3/4th$ of the reaction and time to complete half of the reaction.

Watch Video Solution

4. The half-life period and initial concentration for a reaction are as follows.

What is order of reaction?

View Text Solution

5. The rate of a reaction triples when temperature change from $20^{\circ}C$ to $50^{\circ}C$. Calculate the energy of activation.

Watch Video Solution

6. Sucrose decomposes in acid solution into glucose and fructose according to the first order rate law, with $t_{1/2} = 3.00hr$. What fraction of sample of sucrose remains after $8hr$?

Watch Video Solution

7. A reaction takes place in various steps. The rate constant for first, second, third and fifth steps are k1, k2, k3 and k5 respectively. The overall rate constant is is given by:

$k = \frac{k_2}{k_1}\left(\frac{k_1}{k_2}\right)^{\frac{1}{2}}$ activation energy are 40,60, 50 and 10 kJ/mol respectively, find the overall energy of activation (kJ/mol).

Watch Video Solution

8. The half-life of decomposition of gaseous CH_3CHO at initial pressure of $365mm$ and $170mm$ of Hg were $420\,\text{sec}$ and $880\,\text{sec}$ respectively. The order of the reaction is:

Watch Video Solution

9. A gaseous reaction $A_2(g) \rightarrow B(g) + \frac{1}{2}C(g)$ shows increase in pressure form $100mm$ to $120mm$ in $5\,\text{min}$. What is the rate of disappearance of A_2 ?

Watch Video Solution

10. The reaction $X \rightarrow Y$ is an exothermic reaction. Activation energy of the reaction for X into Y is 150 kJ mol^{-1}. Enthalpy of reaction is 135 kJ mol^{-1}. Calculate the activation energy for the reverse reaction, $Y \rightarrow X$ in $kJmol^{-1}$.

Watch Video Solution

11. 2 g of a radioactive sample having half-life of 15 days was synthesised on 1st Jan. 2009. What is the amount of the sample left behind on 1st March, 2009 (including both the days) in g?

Watch Video Solution

12. Half-lives of decomposition of NH_3 on the surface of a catalyst for different initial pressures are given as:

Find the order of the reaction.

View Text Solution

13. The decomposition of ammonia on tungsten surface at 500 K follows zero order kinetics. The half-life period of this reaction is 45 minutes when the initial pressure is 4 bar. Find the half-life period (in minutes) of the reaction when the initial pressure is 16 bar at the same temperature.

Watch Video Solution

14. The rate of a reaction starting with initial concentration of 2×10^{-3} and $1 \times 10^{-3} M$ are equal to 2.40×10^{-40} and $0.60 \times 10^{-4} Ms^{-1}$, respectively. Calculate the order of reaction w.r.t. reactant and also the rate constant.

Watch Video Solution

15. The instataneous rate of disappearance of the MnO_4^- ion in the following reaction is $4.56 \times 10^{-3} Ms^{-1}$. Then the rate of appearance of I_2 is :

$$2MnO_4^- + 10I^- + 16H^+ \rightarrow 2Mn^{2+} + 5I_2 + 8H_2O$$

A. $1.14 \times 10^{-3} Ms^{-1}$

B. $5.7 \times 10^{-3} Ms^{-1}$

C. $4.56 \times 10^{-3} Ms^{-1}$

D.

Answer: 0.0114

Watch Video Solution

Chapter 19 Surface Chemistry

1. How many of the following are colloid? Sodium chloride, Starch solution, Cane sugar and Blood

Watch Video Solution

2. Which of the following substance gives a positively charged sol?

Watch Video Solution

3. How many of the following are not a colloid? Chlorophyll, Smoke, Ruby glass and Milk

Watch Video Solution

Watch Video Solution

4. For the coagulation of $500mL$ of arsenious sulphide sol, $2mL$ of $1MNaCl$ is required. What is the flocculation value of $NaCl$?

Watch Video Solution

5. The gold number of gelatin is 0.01 . Calculate the amount of gelatin to be added to $1000mL$ of a colloidal sol of gold to prevent its coagulation, before adding $1mL$ of $10\ \%\ NaCl$ solution.

Watch Video Solution

6. $526.3mL$ of $0.5MHCl$ is shaken with $0.5g$ of activated charcoal and filtered. The concentration of the filtrate is reduced to $0.4M$. The amount of adsorption (x/m) is

Watch Video Solution

7. How many colloidal systems exist in nature in which liquid is dispersed phase?

View Text Solution

8. For soaps critical micelle concentration (CMC) is 10^{-x} (min) to $10^{-\gamma}$ (max.) mol/L what is the value of x?

Watch Video Solution

9. Graph between log $\left(\frac{x}{m}\right)$ and log P is a straight line at angle 45° with intercept OA as shown:

Calcualte $\left(\frac{x}{m}\right)$ at a pressure of 2 atm. (Given: k=2)

View Text Solution

10. On addition of $1mL$ solution of $10\,\%\ NaCl$ to $10mL$ gold sol in the presence of $0.0250g$ of starch, the coagulation is just prevented. What is the gold number of starch?

Watch Video Solution

11. 3.6 gram of oxygen of adsorbed on 1.2 g of metal powder. What volume of oxygen adsorbed per gram of the adsorbent at 1 atm and 273 K ?

Watch Video Solution

12. 100 mL of 0.6 M acetic acid is shaken with 2 g activatid carbon . The final concetration solution after adsorption is 0.5 M. what is the amount of acetifc acid adsorbed per gram of carbon ?

Watch Video Solution

13. Find the order of the reaction in which a gas is formed at the surface of tungsten due to adsorption.

Watch Video Solution

14. 1 gm of charcoal adsorbs 100 mL 0.7 M CH_3COOH to form a monolayer, and there by the molarity of CH_3COOH reduces to 0.59. Calculate the surface area of the charcoal adsorbed by each molecule of acetic acid in terms of 10^{-19}. Surface area of charcoal = $3.01 \times 10^2 m^2/gm.$

View Text Solution

15. Twenty precent of the surface sites of a catalyst is occupied by nitrogen molecules. The density of surface sites is $6.023 \times 10^{14} cm^{-2}$. The total sarface area is $1000 cm^2$. The catalyst is is henced to $300K$ and nitrogen is completely desorbed a pressure of 0.001 atm and volume of $2.46 cm^3$. Calculate the number of sites occupied by niitrogen molecules.

Watch Video Solution

Chapter 21 The P Block Elements Group 15 16 17 18

1. The number of σ bonds in P_4O_{10} is

Watch Video Solution

2. How many bonding electron pairs are there in white phosphorus ?

Watch Video Solution

3. The number of $P-O-P$ bonds in cyclic metaphosphoric acid is.

Watch Video Solution

4. Calculate the total number of bond pairs and lone pairs of electrons present in OF_2 molecule.

A. 10

B. 4

C. 6

D. 8

Answer: 10

Watch Video Solution

5. How many forms of SO_3 exists

View Text Solution

6. The number of S-S bonds in sulphur trioxide trimer (S_3O_9) is

Watch Video Solution

7. The number of $P - O - P$ bonds in cyclic metaphosphoric acid is.

Watch Video Solution

8. The number of P-O-P bonds present in P_4O_6 and P_4O_{10} are respectively

Watch Video Solution

9. Bleaching powder and bleach solution are produced on a large scale and used in several hous-hold products. The effectiveness of bleach solution id often measured by iodometry.

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

Watch Video Solution

10. The value of n in the molecular formula $Be_nAl_2Si_6O_{18}$ is:

Watch Video Solution

11. Reaction of Br_2 with Na_2CO_3 in aquesous solution gives sodium bromide bromate with evolution of CO_2 gas. The number of sodium bromide molecules involved in the balanced chemical equation is:

Watch Video Solution

12. Among the following, the number of compounds that can react with PCl_5 to give $POCl_3$ is O_2,CO_2,SO_2,H_2O,H_2SO_4,P_4O_{10}.

Watch Video Solution

13. What is the number of sigma (σ) and pi (π) bonds present in sulphuric acid molecule ?

Watch Video Solution

14. H_3PO_2 is the molecular formula of an acid of phosphorus. Its name and basicity respectively are

Watch Video Solution

15. How many hygroscopic compounds are formed when Cl_2 reacts with hot aqueous NaOH.

View Text Solution

Chapter 22 The D And F Block Elements

1. The colour of $KMnO_4$ solution is decolourised by Fe^{+2} solution, one mole of Fe^{2+} reacts with x moles of $KMnO_4$ Find x.

Watch Video Solution

2. Use Hund's rule to derive the electronic configuration of Ce^{3+} ion, and calculatel its magntic moment on the basis of spin-only formula.

Watch Video Solution

3. A compound of a metal ion $M^{X+}(z = 24)$ has a spin only magnetic moment of $\sqrt{15}B.M.$. The number of unpaired electrons in the compound are

Watch Video Solution

4. The number of ions formed on dissolving one molecule of $FeSO_4(NH_4)_2SO_4.6H_2O$ is

Watch Video Solution

5. 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

Watch Video Solution

6. Titanium shows magnetic moment of $1.73B.M.$ in its compounds. What is the oxidation number of Ti in the compound?

Watch Video Solution

7. Four successive members of the first series of transition metals are listed below. For which one of the of standard potential $\left(E^{\circ}_{M^{2+}/M}\right)$ value has a positive sign ?

Watch Video Solution

8. What is the approximate percentage of iron in mischmetal?

View Text Solution

9. The standard redox potentials for the reactions,

$MN^{2+} + 2e^{-} \rightarrow Mn$ and $Mn^{3+} + e^{-} are$-1.18V and 1.51V respectively.

What is the redox potential for the reaction $Mn^{3+} + 3e^{-} \rightarrow Mn$?

Watch Video Solution

10. $Cr_2O_7^{2-} \xrightarrow{pH=x} CrO_4^{2-} \xrightarrow{pH=y} Cr_2O_7^{2-}$

x and y can be :

Watch Video Solution

11. 12 grams of silver was extracted from a sample of an ore from whidi the only source of silver was Ag_2S . How many grams of Ag_2S were in the original sample?

View Text Solution

12. The oxidation number of Mn in the product of alkaline oxidative fusion of MnO_2 is

Watch Video Solution

13. Out of the following, how many oxides are acidic. MnO, Mn_2O_3, MnO_2, MnO_3, Mn_2O_7.

View Text Solution

14. How many of the transition elements are called Platinum metals.

Watch Video Solution

15. (A) light blue coloured compound on heating will convert into black (B) which reacts with glucose gives red compound (C) and (A) reacts with ammonium hdyroxide in excess in presence of ammonium sulphate give blue compound (D). What is (A), (B), (C) and (D)?

Watch Video Solution

Chapter 23 Coordination Compounds

1. 0.02 mole of $[Co(NH_3)_5Br]Cl_2$ and 0.02 mole of $[Co(NH_3)_5Cl]SO_4$ are present in 200 cc of a solution X. The number of moles of the precipitates Y and Z that are formed when the solution X is treated with excess silver nitrate and excess barium chloride are respectively

Watch Video Solution

2. 50 ml of 0.2 M solution of a compound with empirical formula $CoCl_3.4NH_3$ on treatment with excess of $AgNO_3(aq)$ yields 1.435 g of AgCl. Ammonia is not removed by treatment with concentrated H_2SO_4. The formula of the compound is

Watch Video Solution

3. The ion$Co(en)Cl_2Br_2^-$ is expected to have x isomers. Find the value of x.

View Text Solution

4. How many of the following compounds have optical isomers?

(i) $\left[Co(en)_3Br_3\right]$, (ii) $\left[Co(NH_3)_3Br_3\right]$

(iii) $\left[Co(en)_2Br_2\right]Br$, (iv) $\left[Co(en)(NH_3)_2Br_2\right]Br$

View Text Solution

5. Considering H_2O as a weak field ligand, the number of unpaired electrons in $\left[Mn(H_2O)_6\right]^{2+}$ will be (At. no. of $Mn = 25$)

Watch Video Solution

6. What is the crystal field stabilization energy for high spin d^6 octahedral complex?

Watch Video Solution

7. How many of the following complexes are optically inactive?

(i) trans-$\left[Co(NH_3)_4I_2\right]^+$

(ii) cis-$\left[Co(NH_3)_2(en)_2\right]^{3+}$

(iii) trans-$\left[Co(NH_3)_2(en)_2\right]^{3+}$

Watch Video Solution

8. The coordination number of Fe (II) in oxyhaemoglobin is

Watch Video Solution

9. If PQRS are four different ligands, then how many geometric isomers will be found for square planar $[Pt.\ PQRS]^{2+}$?

Watch Video Solution

10. Among the following complexes : $K_3[Fe(CN)_6]$, $[Co(NH_3)_6]Cl_3$, $Na_3[Co(ox)_3]$, $[Ni(H_2O)_6]Cl_2$, $K_2[Pt(CN)_4]$ and $[Zn(H_2O)_6(NO_3)_2]$

The diamagnetic are .

Watch Video Solution

11. Among $[Ni(CO)_4]$, $[NiBr_4]^{2-}$, $[Co(NH_3)_4Cl_2]Cl$, $Na_3[CoF_6]$, BaO_2 and CsO_2, the total number of diamagnetic compounds is

Watch Video Solution

12. The volume (in mL) of $0.1MAgNO_3$ required for complete precipitation of chloride ions present in $30mL$ of $0.01M$ solution of $[Cr(H_2O)_5Cl]Cl_2$, as silver chloride is close to:

Watch Video Solution

13. $EDTA^{4-}$ i9s ethylenediamine tetraacetate ion The total number of $N-CO-O$ bond angles in $[Co(EDTA)]^{-1}$ complex ion is .

Watch Video Solution

14. Among the complex ions,

$[Co(NH_2-CH_2-CH_2-NH_2)_2Cl_2]^+$, $[CrCl_2(C_2O_4)_2]^{3-}$, $[Fe(H_2O)_4$ and $\left[Co(NH_3)_4(H_2O)Cl\right]^{2+}\Big]$, the number of complex ion (s) that show(s) cis-trans isomerism is

Watch Video Solution

15. Find the total no. of unpaired e~ present in the following complexes.

(i) $[Fe(CO)_5]$, (ii) $[Cr(CO)_6]$

(iii) $[Fe(CN)_6]^{4-}$, (iv) $[Mn(CN)_6]^{4-}$

View Text Solution

1. The number of structural and configurational isomers of a bromo compound, C_5H_9Br, formed by the addition of HBr to 2-pentyne respectively, is:

Watch Video Solution

2. 

Find the sum of total number of isomeric chlorides obtained in these reactions (consider only the major products).

View Text Solution

3. How many total number of alkenes are possible by dehydrobromination of 3-bromo-3-cyclopentylhexane using alcoholic KOH?

View Text Solution

4. How many of the following compounds will give white precipitate with aqueous $AgNO_3$?

View Text Solution

5. 2-bromopentane is treated with alcoholic KOH solution the reaction respectively are :

Watch Video Solution

6. In the following sequence of reactions

$$CH_3 - Br \xrightarrow{KCN} A \xrightarrow{H_3O^+} B \xrightarrow[\text{ether}]{LiAlH_4} C$$

How many sp^3 hybridized atoms are present in product C

Watch Video Solution

7. $CH_3CH_2Cl \xrightarrow{NaCN} X \xrightarrow{Ni/H_2} Y \xrightarrow[\text{anhydride}]{\text{Acetic}} Z$

Find the sum of carbon and hydrogen atoms in product Z.

View Text Solution

8. Consider the following reaction.

$C_2H_5I \xrightarrow{Alc.KOH} X \xrightarrow{Br_2} Y \xrightarrow{KCN} Z$

How many CN group are present in product Z?

Watch Video Solution

9. How many following reactions are correct?

(i) $RX + AgCN \rightarrow RNC$

(ii) $RX + KCN \rightarrow RCN$

(iii) `RX + KNO_(2) to 

(iv) $RX + AgNO_2 \rightarrow R - O - N = O$

View Text Solution

10. In the following sequence of reaction

$$CH_3CH_2OH \xrightarrow{P+I_2} A \xrightarrow[\text{ether}]{Mg} B \xrightarrow{HCHO} C \xrightarrow{H_2O} D$$

Find the number of -OH group in compound D.

View Text Solution

11. Find the total number of lone pair in compound Z which is formed as follows:

$$CH_3CH_2CH_2Br \xrightarrow{aq.NaOH} X \xrightarrow{Al_2O_3} Y \xrightarrow{Cl_2/H_2O} Z$$

View Text Solution

12. An organic compound A with molecular formula C_4H_9 Br on treatment with alcoholic KOH gave two isomeric compounds B and C with the formula C_4H_8 On ozonolysis, B gave only one product CH_3CHO while C gave two different products. Find the sum of carbon atoms in compound A, B and C.

View Text Solution

View Text Solution

13. Consider the following compound:

How many following statements are correct?

(I) Loss of Br (a) atom in dehydrobromination reaction results in the formation of the most reactive double bond towards hydrogenation reaction.

(II) Removal of Br (c) atom results in the formation of the most stable carbocation.

(III) The above compound contains five asymmetric C atoms.

(IV) The above compound does not show geometrical isomers.

View Text Solution

14. IUPAC name of DDT is 2,2-bis (p-chlorophenyl)-1,1,1 -trichloroethane. How many reactive chlorine atoms are there in the compound?

View Text Solution

View Text Solution

15. How many methylanilines are formed when 3-methylchlorobenzene is treated with sodamide in liquid ammonia?

View Text Solution

Chapter 25 Alcohols Phenols And Ether

1. Among the given hydroxyl compound how many will give precipitate immediately when treated with concentrated hydrochloric acid and anhydrous zinc chloride. 3-methyl-2-butanol, 3-methyl-1-butanol, 1-butanol, 2-methyl-2-butanol, 2,3-dimethyl-2-butanol, 2,3-dimcthyl-1-butanol

View Text Solution

2. 

How many products are formed in above reaction?

View Text Solution

3. An ether A $(C_5H_{12}O)$ when heated with excess hot concentrated HI produced two alkyl halides which on hydrolysis give B and C. Oxidation of B gives an acid D whereas oxidation of C gives ketone E. Both B and C give haloform reaction. Identify A to E along with their structures and the given reactions.

Watch Video Solution

4. How many of the given reaction will form tert-Butyl ethyl ether?

I) tert - Butanol + Ethanol $\xrightarrow{H^+}$

(II) tert-Butyl bromide + Sodium ethoxide $\rightarrow$

(III) Sodium tot-butoxide + Ethyl bromide $\rightarrow$

(iv) Isobutene + Ethanol $\xrightarrow{H^+}$

View Text Solution

5. Which of the following statements is/ are true?

(I) Ethers are soluble in cone. H_2SO_4 but separate out on addition of water.

(II) Ethers are used as solvents for BF_3 and Grignard reagent.

(III) Mononitration of p-methylanisolc gives 2-nitro-4-methylanisole

(IV) Monobromination ofp-ethoxyphenol gives 2-bromo-4-ethoxyphenol

(V) 4-Chlorophenol (I) will dissolve in NaOH but 4-chloro-1 -methyl benzene (II) will not.

(VI) 4-Methyl benzoic (111) acid will dissolve in aq. $NaHCO_3$, but 4-methyl phenol (IV) will not.

(VII) 2,4,6-Trinilrophenol (V) will dissolve in aq. $NaHCO_3$ but 4-methyl phenol (VI) will not.

(VIII) 4-Ethyl phenol (VII) will dissolve in aq. NaOH but ethyl phenyl ether (VI11) will not.

View Text Solution

6. Generally, phenols, 1,3,1,4-benzenediols and 1,3,5- benzenetriols do not react with $NaBH_4 / H_3O^+$, However, 1,3,5-benzenetrioI (phloroglucinol) gives a high yield of product (B).

The compound (B) has how many functional groups on benzene ring?

View Text Solution

7. `underset("Chiral ether")(A(C_(5)H_(10)O) overset(Hot HI) to C_(5)H_(10)I_(2)(B) overset("hot")underset(KOH + EtOH) to 

How many members are there in the ring of structure of A?

View Text Solution

8. 

How many among the below given compounds correctly match the products of the given reaction sequence?

View Text Solution

9. The reactivity of compound Z with different halogens under appropriate conditions is given below:

How many among the below given statements correctly explains pattern of elctrophilic substitution?

(I) The steric effect of the halogen.

(II) The steric effect of the tot-butyl group.

(III) The electronic effect of the phenolic group.

(IV) The electronic effect of the tot-butyl group.

(V) The mesomeric effect of tot-butyl group.

View Text Solution

10. When phenol is reacted with $CHCl_3$ and NaOH followed by acidification, salicylaldehyde is obtained. How many among following

species are involved in the above mentioned reaction as intermediates?

View Text Solution

11. How many total number of'carbon has sp^2 hybridization in 5. the compound X and Y ?

View Text Solution

12. Total number of isomers, considering only structural isomers of cyclic ethers with the molecular formula C_4H_8O is.....

Watch Video Solution

13. What amount of bromine will be required to convert $2g$ of phenol into $2, 4, 6 -$ tribromphenol

Watch Video Solution

14. Calculate the number of metamers represented by molecular formula $C_4H_{10}O$.

Watch Video Solution

15. How many number of dihydric phenols possible with the molecular formula

$C_6H_6O_2$.

Watch Video Solution

Chapter 26 Aldehydes Ketones And Carboxylic Acid

1. Acetic acid is dissolved in water having oxygen as ^{18}O Howmany ^{18}O atom will be present in the product molecule?

View Text Solution

2. 

How many number of sp^2 hybridised carbon atoms are there in the product Z.

View Text Solution

3. How many membered ring will be formed in the product P of the following reaction.

View Text Solution

4. Compound A is obtained by following reaction.

$$CH_3COOC_2H_5 \xrightarrow[(ii)\,H_3O^+]{(i)\,C_2H_5ONa} [A]$$

How many following statement(s) is(are) true about A ?

(i) It gives red colour with blue litmus solution.

(ii) It decomposes $NaHCO_3$, solution and evolves CO_2 gas.

(iii) It decolourises bromine water colour.

(iv) It reacts with 2,4-dinitrophenyl-hydrazine

(v) Product A will undergo acid catalysed halogenation.

View Text Solution

5. How many of the following compound is decarboxyl ated on heating ?

(i) $\begin{matrix} CH_2COOH \\ | \\ CH_2COOH \end{matrix}$, (ii) $C_2H_5(COOH)_2$

(iii) CH_3COCH_2COOH, (iv) 

View Text Solution

6. How many of the following compounds can be used as an acylating agent ?

(i) CH_3COCl, (ii) $(CH_3CO)_2O$

(iii) CH_3COOH,(iv) CH_2CH_2COCl.

View Text Solution

7. In the scheme given below, how many number of intramolecular aldol condensation products formed from 'Y'?

View Text Solution

8. Among the following, how many number of reaction(s) produce(s) benzaldehyde?

View Text Solution

9. Find the number of reactants among the given options which does not undergo Michael addition?

(i) $C_6H_2CH = CHCOCH_3 + C_6H_5COCH_3$

(II) $C_6H_5CH = CHCH_2COC_6H_5 + CH_2(COOC_2H_5)_2$

(III)

(IV) $CH_2 - CHCOCH_3 + CH_3COCH_3$

View Text Solution

10. How many number of aldol reaction(s) occurs in the given transformation?

View Text Solution

11. How many number of organic compounds among the following compounds are present in the reaction mixture after the completion of reactions I and II?

View Text Solution

12. Find the total number of product in the given reaction

View Text Solution

13. How many steps are there in the mechanism of the following reaction?

View Text Solution

14. An unknown compound of car bon, hydrogen and oxygen contains 69.77% carbon and 11.63% hydrogen and has a molecular weight of 86. It does not reduce Fehling solution, but forms a bisulphite addition compound and gives a positive iodoform test. How many possible structures can be drawn for the unknown compound?

View Text Solution

15. How many total number of ketonic groups are present in compound C and D in the given reaction sequence?

View Text Solution

Chapter 27 Amines

1. How many alkenes can be formed when n-butylamine is treated with nitrous acid

Watch Video Solution

2. 

How many statements are correct?

(I) Pyrrole is more basic than pyridine.

(II) Pyridine is more basic than pyrrole and aniline.

(III) Aniline is more basic than pyridine.

(IV) All are aromatic bases.

View Text Solution

3. Consider the following reaction:

(i) 

Find the sum of total number of nitrogen atoms, which are present in products A, B, C and D.

View Text Solution

4. Find the difference between the number of products formed in given reactions.

(i) $C_6H_5N^+Me_3OH$

(ii) 

View Text Solution

5. 

Total number of Br atom in produc t "P" is-

View Text Solution

6. $Ph - NH_2 \xrightarrow[0-5^\circ C]{NaNO_2 / HCl} \xrightarrow[dil.HCl]{Ph-NH_2} (X)$

Find the sum of number of nitrogen atoms present in (X) and the total number of stereoisomers of (X) formed.

View Text Solution

7. 

E has how many halogens?

View Text Solution

8. In following conversion, find the number of carbon atoms in products.

View Text Solution

9. 

Find the number ofunsaturaled carbon in the product

View Text Solution

Chapter 28 Biomolecules

1. For 'invert sugar', the total number of correct statement(s) is(are)

(Given : specific rotations of (+) -sucrose, (+)-maltose, L-(-)-glucose and L-(+) fructose in aqueous solution are + 66°, + 140°, -52° and $+92^{\circ}$ respectively)

(I) 'invert sugar' is prepared by acid catalyzed hydrolysis of maltose.

(II) 'invert sugar' is an equimolar mixture of D-(+)~giucose and D-(-)-fruetose.

(III) specific rotation of'invert sugar' is -20°.

(IV) on reaction with Br_2 water, 'invert sugar' forms saccharic acid as one of the products.

View Text Solution

2. How many dipeptides are possible from two molecules of a typical α-amino acid ?

Watch Video Solution

3. The total number of basic groups in the following form of lysine is

View Text Solution

4. A decapeptide (Mol. Wt. 769) on complete hydrolysis gives glycine (Mol. Wt. 75), alanine and phenylalanine.

Glycine contributes 47.0% to the total weight of the hydrolysed products. The number of glycine units. Present in the decapeptide is.

Watch Video Solution

5. When the following aldohexose exists in its D-configuration, the total number of stereoisomers in its pyranose form is :

$CHO - CH_2 - CHOH - CHOH - CH_2OH$

View Text Solution

6. A tetrapeptide has $-COOH$ group on alanine. This produces glycine (Gly), valine (Val), phenyl alanine (Phe) and alanine (Ala), on complete hydrolysis. For this tetrapeptide, the number of possible sequences (primary structures) with $-NH_2$ group attached to a chiral centre is :

Watch Video Solution

7. The specific optical rotations of pure a- and b-D-mannopyranose are + 29.3° and -17.0, respectively. When either form is dissolved in water, specific optical rotation of the equilibrium mixture is found to be + 14.2°. Calculate the percentage of a anomer at equilibrium.

View Text Solution

8. Penicillin, the common antibiotic, has following structure :

Find the number of different functional groups present in it.

View Text Solution

9. The enzyme cytochrome C, involved in oxidation-reduction processes in the living system, has 0.43% Fe and 1.48% S. Calculate the number of S atoms in the enzyme per Fe atom.

View Text Solution

10. A strongly alkaline solution of a monoaminodicarboxylic acid contains how many basic groups ?

View Text Solution