# CHEMISTRY

## BOOKS - OSWAAL PUBLICATION CHEMISTRY (KANNADA ENGLISH)

## Solved Paper 1

**Exercise**

**1.** State Raoult's law of a binary solution for two volatile liquid components.

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**2.** Van't Hoff factor for a solution is more than one. what is the conculsion drawn form it ?

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**3.** Write the anodic reaction taking place at $H_2 - O_2$ fuel cell.

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**4.** Rate of reaction, $A \rightarrow rB$ increases two times by increasing the concentration 'A' by four times, what is the order of a reaction?

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**5.** What happens to the entropy of a gas after adsorption?

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**6.** Name the method of refining of silicon.

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**7.** Complete the reaction, $2XeF_4 + 3H_2O \rightarrow \ - \ + 6HF$.

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**8.** Name the major product obtained when tertiary butyl bromide is heated with alcoholic KOH solution.

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**9.** Give the IUPAC name of $CH_2 = CH - CHO$.

Watch Video Solution

**10.** Give an example for fat soluble vitamin.

Watch Video Solution

**11.** How is ferrimagnetism arises in substances? Give an example of substance showing ferrrimagnetism.

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**12.** $\lambda_m^\circ$ for $NaCl, HCl$ and $CH_3COONa$ are 126.4,425.9 and $91.0\ \mathrm{S\ cm^2\ /mol}$ respectively. Calculate $\lambda_m^\circ$ for $CH_3COOH$.

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**13.** In a reaction 2A product, the concentration of A decreases from 0.5 mol L-1 to 0.4 mol L-1 in 10 minutes. Calculate the rate during this interval.

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**14.** Study of actinide elements is difficult. Give two reasons.

Watch Video Solution

**15.** Explain Kolbe's reaction

Watch Video Solution

**16.** Among methonic acid and ethanoic acid which is more acidic and why?

Watch Video Solution

**17.** Name: Artificial sweetening agent used only in cold food.

Watch Video Solution

**18.** Name: Anionic detergent.

Watch Video Solution

**19.** Give an example each for antifertility drug and antiseptics .

Watch Video Solution

**20.** (a) Write the chemical reactions involved in the exraction of gold using sodium cyanide.

Watch Video Solution

**21.** Write the composition of copper matte.

Watch Video Solution

**22.** Write the balanced chemical equation with condition involved in the manufacture of nitric acid by Ostwal's process .

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**23.** Complete the equation: $SO_2 + Cl_2 \rightarrow \ldots\ldots\ldots$

Watch Video Solution

**24.** Complete the equation: $2NaCl + H_2SO_4 \rightarrow \ldots\ldots\ldots + Na_2SO_4$.

Watch Video Solution

**25.** Complete the equation: $Pbs + 4O_3 \rightarrow \ldots\ldots\ldots + 4O_2$.

Watch Video Solution

**26.** Given reason: ICI is more reactive than $I_2$.

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**27.** Fluorine exhibits-1 oxidation state. Give reasons.

Watch Video Solution

**28.** HF is liquid where as HCl, HBr ..... Other hydrogen halide is liquid.

Watch Video Solution

**29.** Give any two reasons for the formation of large number of complex compounds by transition metals.

Watch Video Solution

**30.** Write the formula to calculate spin only magnetic moment.

Watch Video Solution

**31.** Write the balanced equations in the manufacture of potassium dichromate from chromite ore.

Watch Video Solution

**32.** Using valence bond theory explain geometry, hybridisation and magnetic property of $[CoF_6]_3^-$ (Atomic number of Co = 27).

Watch Video Solution

**33.** Give any two postulates of Werner's theory.

Watch Video Solution

**34.** Write the structure of trans isomer of $\left[Co(NH_3)_4CI_2\right]^-$.

Watch Video Solution

**35.** Calculate the packing efficiency in Face Centred Cubic (FCC) structure.

Watch Video Solution

**36.** Give any two differences between Frenkel and Schottky defects .

Watch Video Solution

**37.** The vapour pressure of pure benzene at a certain tempreature is 0.850 bar. A non-volatile. non-electrolyte solid weighing 0.5g, when added to 39.0g of benzene (molar mass of benzene 78g $mol^{-1}$) vapour pressure of the solution then is 0.845 bar. What is the molar mass of the solid substance?

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**38.** What is Reverse Osmosis? Mention its one partical utility.

Watch Video Solution

**39.** Calculate the equilibrium constant for the reaction

$Cu(s) + 2Ag + (aq) \rightarrow Cu^{+2}(aq) + 2Ag(s), E^{\circ}_{\text{cell}} = 0.46V.$

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**40.** Write half cell reaction and E^o Value of (SHE) standard hydrogen electrode.

Watch Video Solution

**41.** Derive an intergrated rate for the first order reaction.

Watch Video Solution

**42.** Write any two factors responsible for effective collisions.

Watch Video Solution

**43.** What is shape selective catalysis? Give an example of such type of catalyst.

Watch Video Solution

**44.** What are emulsions? Give an example of oil dispersed in water (o/w) type emulsion.

Watch Video Solution

**45.** Mention any one application of adsorption.

Watch Video Solution

**46.** Write steps involved in $S_N1$ mechanism to the conversion of tertiary butyl bromide into tertiary butyl alcohol and mention its order.

Watch Video Solution

**47.** Aryl halides are less reactive towards nucleophilic substitution reaction. Give four reasons.

Watch Video Solution

**48.** Write the mechanism of acid catalysed dehydration of ethanol to ethene.

Watch Video Solution

**49.** Explain Reimer-Tiemann reaction.

Watch Video Solution

**50.** Explain Cannizzaro reaction with an example.

Watch Video Solution

**51.** Explain Hoffmann bromamide degradation reaction.

Watch Video Solution

**52.** Name the major product obtained when nitrous aicd is treated with Methylamine

Watch Video Solution

**53.** Name the major organic product formed in the following conversion.

(ii) Benzene diazonium chloride is treated with KI.

Watch Video Solution

**54.** Write Howorth structure of "Lactose".

Watch Video Solution

**55.** What are essential amino acids ? Give an example.

Watch Video Solution

**56.** Name the pentose sugar present in RNA molecule.

Watch Video Solution

**57.** Name the monomers present in the following polymers.

Nylon-6

Watch Video Solution

**58.** Name the monomer present in natural rubber.

Watch Video Solution

**59.** Name the monomers present in the following polymers.

Neoprene

Watch Video Solution

**60.** What are co-polymers? Give example.

Watch Video Solution

**61.** How does molarity varies with temperature?

Watch Video Solution

**62.** 10 mL of liquid 'A' is mixed with 10 mL of liquid 'B', the volume of the resultant solution is 19.9 ml. What type of deviation expected from Raoult's law ?

Watch Video Solution

**63.** Write the mathematical expression for limiting molar conductivity of sodium chloride.

Watch Video Solution

**64.** Define collision frequency.

Watch Video Solution

**65.** Name the adsorbent used to removal of colouring matter from solution.

Watch Video Solution

**66.** Give an example of a metal purified by Mond process.

Watch Video Solution

**67.** Which noble gas is most abundant in atmospheric dry air ?

Watch Video Solution

**68.** Formaldehyde [HCHO] Undergoes Cannizzaro reaction: Give reason.

Watch Video Solution

**69.** Deficiency of which vitamin causes the disease scurvy.

Watch Video Solution

**70.** Give the differences between crystalline and amorphous solids with respect to shape and melting point.

Watch Video Solution

**71.** Write the cathodic and anodic cell reactions of Hydrogen-Oxygen fuel cell.

Watch Video Solution

**72.** What is lanthanoid contraction? Mention the cause for it.

Watch Video Solution

**73.** How anisole reacts with acetyl chloride $[CH_3COCl]$ in the presence of anhydrous $AlCl_3$? Write the chemical equation for the reaction.

Watch Video Solution

**74.** What is the action of ammonia $[NH_3]$ on benzoic acid? Write equation.

Watch Video Solution

**75.** Give an example for non narcotic analgesics.

Watch Video Solution

**76.** Give an example for: Antiseptics

Watch Video Solution

**77.** What are anionic detergents? Give an example.

Watch Video Solution

**78.** During the extraction of aluminium by Hall-Heroult process at which electrode oxygen gas is liberated.

Watch Video Solution

**79.** During the extraction of aluminium by Hall-Heroult process at which electrode oxygen gas is liberated.

Watch Video Solution

**80.** During the extraction of aluminium by Hall-Heroult process at which electrode oxygen gas is liberated.

Watch Video Solution

**81.** In the manufactore of ammonia by Haber's process, write the flow chart and chemical equations with optimum conditions.

Watch Video Solution

**82.** Mention any two reasons for the anomalous behaviour of oxygen.

Watch Video Solution

**83.** Write the balanced chemical equation for the action of concentrated sulphuric acid on copper metal.

Watch Video Solution

**84.** Complete the following equation: $2NaOH(cold \text{ and } dil) + Cl_2 \rightarrow$

Watch Video Solution

**85.** Complete the following equations:

$Cl_2 + 3F_2 \xrightarrow{573K} \ldots\ldots$

Watch Video Solution

**86.** Write the structure of chlorous acid $[HOCIO]$

Watch Video Solution

**87.** Calculate the spin only magnetic moment of $Fe^{2+}$

Watch Video Solution

**88.** Which element of 3d series exhibits maximum oxidation state?

Watch Video Solution

**89.** How is $KMnO_4$ [Potassium permanganate] is prepared from $MnO_2$? Write equations.

Watch Video Solution

**90.** Explain the hybridisation, geometry and magnetic property of $\left[Ni(Cl)_4\right]^{2-}$.

Watch Video Solution

**91.** Write the cis and trans isomeric structures of $\left[Fe(NH_3)_2(CN)_4\right]^-$.

Watch Video Solution

**92.** What is the co - ordination number of $Fe$ in $\left[FeCl_2(en)_2\right]Cl$?

Watch Video Solution

**93.** Calculate packing efficiency in simple cubic unit cell.

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**94.** An element having atomic mass 63.1 g/mol has face centred cubic unit cell with edge length $3.608 \times 10^{-8} cm$. Calculate the density of unit cell. [Given : $NA = 6.022 \times 1023 \ \ \text{atoms/mol}$].

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**95.** 1.0 g of non - electrolyte solute dissolved in 50 g of benzene lowered the freezing point of benzene by 0.4 K. Find the molar mass of the solute. [Given : Freezing point depression constant of benzene = 5.12 K. kg mol].

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**96.** How solubility of a gas in liquid varies with (i) Temperature and (ii) pressure?

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**97.** (a) The electrode potential for the Daniell cell given below is 1.1 V.

$Zn(s)\left|Z_n^{2+}(aq)\right|\left|Cu^{2+}(aq)\right|Cu(s)$

Write overall cell reaction and calculate the standard Gibb's energy for the reaction. $[F96487c/mol]$

(b) Mention any two factors which affects the conductivity of electrolytic solution .

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**98.** Mention any two factors which affects the conductivity of electrolytic solution.

Watch Video Solution

**99.** Derive an integrated rate equation for rate constant of a zero order reaction.

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**100.** Write the Arrhenius equation and mention what each term stands for.

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**101.** Write

i) Arrhenius equation.

ii) The formula to calculate half life. Period of zero order reaction.

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**102.** (a) Give any two differences between lyophilic and lyophobic colloids.

(b) Write the two steps involved in the mechanism of enzyme catalysed reaction.

(c) What is the entropy change $(\Delta s)$ for adsorption ?

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**103.** (a) Give any two differences between lyophilic and lyophobic colloids.

(b) Write the two steps involved in the mechanism of enzyme catalysed reaction.

(c) What is the entropy change $(\Delta s)$ for adsorption ?

Watch Video Solution

Watch Video Solution

**104.** (a) Give any two differences between lyophilic and lyophobic colloids.

(b) Write the two steps involved in the mechanism of enzyme catalysed reaction.

(c) What is the entropy change $(\Delta s)$ for adsorption ?

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**105.** Write $SN^2$ mechanism of the conversion of methyl chloride to methyl alcohol.

Watch Video Solution

**106.** Aryl halides are less reactive towards nucleophilic substitution reaction. Give four reasons.

Watch Video Solution

**107.** What is asymmetric carbon atom.

Watch Video Solution

**108.** Explain the Kolbe's reaction with equation.

Watch Video Solution

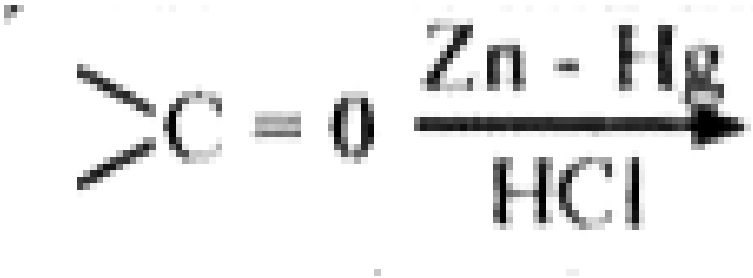
**109.** Write the mechanism of acid catalysed dehydration of ethanol to ethene.

Watch Video Solution

**110.** How benzene is converted into benzaldehyde by Gatterman-Koch reaction.

Watch Video Solution

**111.** Complete and name the following reaction.

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**112.** What is the effect of electron withdrawing group on the acidity of carboxylic acid ?

Watch Video Solution

**113.** How is methylamine prepared by Hoffmann bromamide degradation reaction ? Give equation.

Watch Video Solution

**114.** Write IUPAC name of $CH_3CH_2NH_2$.

Watch Video Solution

**115.** i) Write IUPAC name of $CH_3CH_2NH_2$.

ii) Arrange the following amines in the order of their increasing basic strength in aqueous solution.

$(CH_3)_3N_1, (CH_3)_2NH_1, CH_3NH_2$.

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**116.** Complete the following equation.

$C_6H_5NH_2 + NaNO_2 + 2HCL \xrightarrow{273-278K}$

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**117.** Write Haworth structure for maltose.

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**118.** Give an example for globular proteins.

Watch Video Solution

**119.** Give an example for

i) Globular proteins.

ii) Naturally occurring optically inactive amino acid.

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**120.** Name the nucleic acid which is responsible for genetic information.

Watch Video Solution

**121.** Explain the preparation of Buna-N with equation.

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**122.** Name the monomer present in the following polymer

i) Poly vinyl chloride. Ii) Natural rubber.

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**123.** Name the monomer present in the following polymer

i) Poly vinyl chloride. Ii) Natural rubber.

Watch Video Solution

**124.** Give an example for biodegradable polymer.

Watch Video Solution

**125.** What is the value of Van't Hoff's factor (i) for $K_2SO_4$?

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**126.** 10 mL of liquid 'A' is mixed with 10 mL of liquid 'B', the volume of the resultant solution is 19.9 ml. What type of deviation expected from Raoult's law ?

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**127.** What is a secondary cell? Write the equation for the cathodic reaction of lead storage battery ?

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**128.** Identify the order of the reaction from the rate constant $K = 2.3 \times 10^{-6} L \ \ \text{mol}^{-1} s^{-1}$

Watch Video Solution

**129.** Give reason: Zeolites are good shape-selective catalyst.

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**130.** Iron scraps are advisable and advantageous than zinc scraps for reducing the low grade copper ores. Why?

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**131.** Complete the reaction: $XeF_6 + H_2O \rightarrow \overset{?}{.}\ldots\ldots\ldots + 2HF$

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**132.** Give reason. In case of optically active alkyl halides, SN1 reactions are accompanied by racemisation

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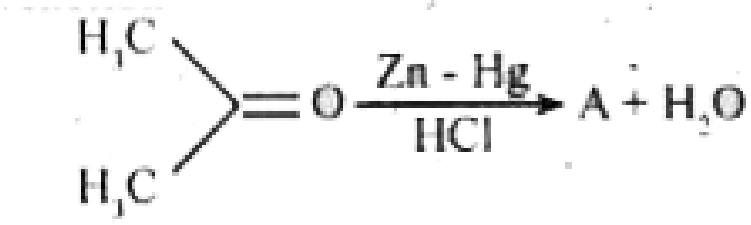
**133.** Identify "A" in the reaction

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**134.** Give an example for water soluble vitamin.

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**135.** A solution of $Ni(NO_3)_2$ is electrolysed between platinum electrodes using a current of 5 amperes for 20 minutes. What mass of nickel is deposited at the cathode?[molar mass of Ni $= 58.7gma \ \ \mathrm{mol}^{-1}$]

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**136.** Mention any two factors which influence the rate of the reaction.

Watch Video Solution

**137.** Give two reasons the chemistry of actinoids is more complicated than Lanthnoids.

Watch Video Solution

**138.** How is phenol prepared from Aniline? Write the equation.

Watch Video Solution

**139.** Explain cannizzaro's reaction taking benzaldehyde as an example.

Watch Video Solution

**140.** Give an example for non narcotic analgesics.

Watch Video Solution

**141.** (a) Give an example for non-narcotic analgesic.

(b) Why the use of Aspartame is limited to cold foods and soft drinks ?

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**142.** (a) Why detergents with straight chain of hydrocarbons are prefered over branched chain hydrocarbons?

(b) Give one example for detergent with straight chain hydrocarbon.

Watch Video Solution

**143.** (a) Why detergents with straight chain of hydrocarbons are prefered over branched chain hydrocarbons?

(b) Give one example for detergent with straight chain hydrocarbon.

Watch Video Solution

**144.** Write the equations for the reactions involved in the leaching of alumina from bauxite ore.

Watch Video Solution

**145.** Mention any two anomalous properties of nitrogen.

Watch Video Solution

**146.** In the manufacture of sulphuric acid write :

(i) The equation with condition for oxidation of $SO_2$ to $SO_3$.

(ii) Formation of Oleum from $SO_3$.

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**147.** In the manufacturing of sulphuric acid write

the formation of Oleum from $SO_3$.

Watch Video Solution

**148.** (a) Complete the following reaction :

(i) $NH_3 + 3Cl_2 \rightarrow \ldots .\overset{?}{.}\ldots . + 3HCl$

(ii) $Cl_2 + F_2 \overset{473K}{\longrightarrow} \ldots \overset{?}{.}\ldots$

(b) Write the structure of perchloric acid $(HClO_4)$.

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**149.** Complete the following equations:

$Cl_2 + 3F_2 \overset{573K}{\longrightarrow} \ldots \ldots .$

Watch Video Solution

**150.** Write the structure of perchloric acid $(HClO_4)$

Watch Video Solution

**151.** Transition elements show catalytic property. Give two reasons.

Watch Video Solution

**152.** Name one 3d series element that do not show variable oxidation state.

Watch Video Solution

**153.** Explain the manufacture of Potassium dichromate from chromite ore.

Watch Video Solution

**154.** Using valence bond theory explain geometry, hybridisation and magnetic property of $[CoF_6]_3^-$ (Atomic number of Co = 27).

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**155.** Write any two postulates of Werner's theory of co-ordination compounds.

Watch Video Solution

**156.** Indicate the type of Isomerism in the following set of complex compounds.

$[Co(NH_3)_5SCN]Cl_2$ and $[Co(NH_3)5NCS]Cl_2$

Watch Video Solution

**157.** Calculate packing efficiency in BCC lattice.

Watch Video Solution

**158.** Calcium metal crystallises in a face centered cubic lattice with edge length of 0.556nm. Calculate the density of the metal. [Atomic mass of calcium 40 g/mol]

$\left[N_A = 6.022 \times 10^{23} \text{ atoms/ mol}\right]$

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**159.** Vapour pressure of benzene is 200 mm of Hg. When 2 gram of a non-volatile solute dissolved in 78 gram benzene, benzene has vapour pressure of 195 mm of Hg. Calculate the molar mass of the solute. [Molar mass of benzene is 78 g/$mol^{-1}$]

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**160.** What are azeotropes? Give an example for binary solutions showing minimum boiling azeotrope.

Watch Video Solution

**161.** Calculate the e.m.f. of the cell in which the following reaction takes place.

$Ni_{(s)} + 2Ag^{+}_{(0.002M)} \rightarrow Ni^{2+}_{(0.160M)} + 2Ag_{(s)}$, Given $E^{\circ}_{\text{cell}} = 1.05V$

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**162.** State Kohlrausch law of independent migration of ions.

Watch Video Solution

**163.** What is limiting molar conductivity?

Watch Video Solution

**164.** Derive an intergrated rate for the first order reaction.

Watch Video Solution

**165.** According to collision theory, what are the two factors that lead to effective collisions

Watch Video Solution

**166.** What is dialysis ? Explain ?

Watch Video Solution

**167.** How $\Delta H$, $\Delta S$ and $\Delta G$ changes during adsorption ?

Watch Video Solution

**168.** Give an example for heterogeneous catalysis.

Watch Video Solution

**169.** Write steps involved in $S_N1$ mechanism to the conversion of tertiary butyl bromide into tertiary butyl alcohol and mention its order.

Watch Video Solution

**170.** Complete the following reactions:

$CH_3 - CH = CH_2 + HI \rightarrow$

Watch Video Solution

**171.** Complete the following reactions:

Watch Video Solution

**172.** Complete the following reactions:

$$CH_3CH_2Br \xrightarrow[\text{Aq. Ethanol}]{AgCN}$$

Watch Video Solution

**173.** Write the mechanism of acid catalysed dehydration of ethanol to ethene.

Watch Video Solution

**174.** How does anisole react with methyl chloride?

Watch Video Solution

**175.** How is benzoyl chloride converted into benzaldehyde. Write the equation and name the reaction.

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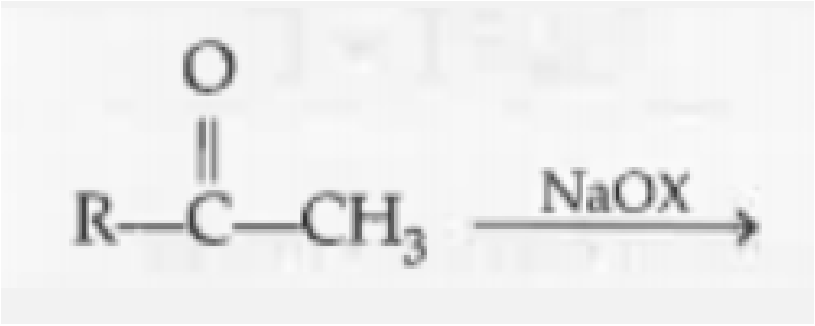
**176.** Write a general equation for the formation of carboxylic acid from Grignard reagent.

Watch Video Solution

**177.** Complete the reaction

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**178.** Mention the IUPAC name of (CH3)2NCH3

Watch Video Solution

**179.** (a) Mention the I.U.P.A.C. name of $(CH_3CH_2)_2 - N - CH_3$.

(b) How is Aniline prepared from nitrobenzene ?

(c ) Give the equation for the conversion of aniline to 4-bromo aniline.

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**180.** Give the equation for the conversion of aniline to 4-Bromo aniline.

Watch Video Solution

**181.** Write a chemical reactions to elucidate

Glucose contains five - OH groups.

Watch Video Solution

**182.** Write a chemical reactions to elucidate

Glucose contains six carbon atoms in a straight chain.

Watch Video Solution

**183.** Explain denaturation of proteins with example.

Watch Video Solution

**184.** Name the sugar moiety present in DNA.

Watch Video Solution

**185.** Name the monomers present in the following polymers.

PVC

Watch Video Solution

**186.** Name the monomers present in the following polymers.

Neoprene

Watch Video Solution

**187.** Name the monomers present in the following polymers.

Nylon-6

Watch Video Solution

## Example

**1.** The experimental value for the molar mass of a non-volatile solute is twice the theoretical value. What is the Van't Hoff factor for the solute?

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**2.** Define ppm.

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**3.** Which of the following has a higher value for molar conductivity under similar conditions? $0.1\mathrm{M}\ \mathrm{KCl}$ or $0.01\ \mathrm{M}\ \mathrm{KCI}$.

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**4.** For the reaction $A + B \rightarrow P$, the rate is given by Rate $= K[A]^1[B]^2$. By how many times does the rate of reaction increase when concentrations of A & B are doubled?

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**5.** Name the biocatalyst involved in the conversion of glucose into ethanol and carbon dioxide.

Watch Video Solution

**6.** Write the formula of the volatile compound formed during the purification of nickel by Mond's process.

Watch Video Solution

**7.** What is the geometry of oxide of xenon formed when $XeF_6$ is hydrolysed?

Watch Video Solution

**8.** Between chlorobenzene and chloroethane, which is more reactive towards nucleophilic substitution reaction?

Watch Video Solution

**9.** Pentan-3- one does not undergo iodoform reaction. Give reason.

Watch Video Solution

**10.** Name the nitrogenous base present in DNA but not in RNA.

Watch Video Solution

**11.** What type of vacancy defect is shown by a crystal of sodium chloride?

Watch Video Solution

**12.** Which of the following is an example of a molecular solid?

Diamond, ZnS, Solid Iodine, gold

Watch Video Solution

**13.** i) According to the equation $Cu^{2+} + 2e^{-} \rightarrow Cu$, how many moles of copper are deposited when 965C of electricity is passed through a solution of $Cu^{2+}$ ions?

$(1F = 96500C)$.

Watch Video Solution

**14.** Mention any one application of Kohlrausch law.

Watch Video Solution

**15.** Derive the relation between half life and initial concentration of a zero order reaction, $R \rightarrow P$.

Watch Video Solution

**16.** What is the common oxidation state shown by Lanthanoids? Mention any one consequence of Lanthanoid contraction.

Watch Video Solution

**17.** $C_2H_5OH + Na \ \ (\text{Metal}) \rightarrow X, X + C_2H_5Br \xrightarrow{\text{Williamson reaction}} Y.$

What are X and Y?

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**18.** Explain the Wolff-Kischner reduction of acetone and write the equation for the same.

Watch Video Solution

**19.** Give an example of a narcotic analgesic.

Watch Video Solution

**20.** Based on theraupatic action, to which class of drug does ranitidine belong to?

Watch Video Solution

**21.** What is the role of aspartame in the food industry?

Watch Video Solution

**22.** What is saponification?

Watch Video Solution

**23.** Write the equations for the reactions involved in the leaching of alumina from bauxite ore.

Watch Video Solution

**24.** In the manufacture of ammonia by Haber's process:

i) Mention the optimum temperature and optimum pressure employed.

ii) What is the role played by potassium oxide $(K_2O)$?

Watch Video Solution

**25.** In the manufacture of ammonia by Haber's process:

i) Mention the optimum temperature and optimum pressure employed.

ii) What is the role played by potassium oxide $(K_2O)$?

Watch Video Solution

**26.** a) Complete the following equations:

i) $PbS_{(s)} + 4O_{3(g)} \rightarrow$

ii) $2NaOH + SO_2 \rightarrow$

Watch Video Solution

**27.** Complete the following equations:

$2NaOH + SO_2 \rightarrow$

Watch Video Solution

**28.** Write the structure of oleum $(H_2S_2O_7)$

Watch Video Solution

**29.** a) Give reason:

i) Fluorine exhibits only one oxidation state whereas other halogens exhibit multiple oxidation states.

ii) Most of the reactions with fluorine are exothermic.

Watch Video Solution

**30.** a) Give reason:

i) Fluorine exhibits only one oxidation state whereas other halogens exhibit multiple oxidation states.

ii) Most of the reactions with fluorine are exothermic.

Watch Video Solution

**31.** b) Write the missing product:

$NH_3 + 3Cl_{2(\text{excess})} \rightarrow \ ? \ + 3HCl.$

Watch Video Solution

**32.** Explain the preparation of potassium permanganate from $MnO_2$ Write the balanced chemical equations for the reactions involved.

Watch Video Solution

**33.** Give reasons:

i) Generally there is increase in density along 3d series of transition metals.

Watch Video Solution

**34.** Give reasons:

Third ionisation enthalpy of manganese is unusually high.

Watch Video Solution

**35.** Which of the following ions is coloured in aqueous solution?

i) $Sc^{3+}$ ii)$Co^{2+}$ iii) $Cu^{+}$

Watch Video Solution

**36.** Which of the following ions is coloured in aqueous solution?

i) $Sc^{3+}$ ii)$Co^{2+}$ iii) $Cu^{+}$

Watch Video Solution

**37.** Which of the following ions is coloured in aqueous solution?

i) $Sc^{3+}$ ii)$Co^{2+}$ iii) $Cu^{+}$

Watch Video Solution

**38.** Using valence bond theory account for the geometry and magnetic nature of $[NiCl_4]^{2-}$ ion. $(\text{Atomic number of Ni} = 28)$.

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**39.** a) In the complex compound represented by $CoCl_3.4NH_3$, how many ammonia molecules satisfy the secondary valence of cobalt if one mole of

the compound upon treatment with excess $AgNO_3$ produces one mole of $AgCl_{(s)}$

Watch Video Solution

**40.** b) What type of structural, isomerism is exhibited by the complex $Co(NH_3)_5NO_2]^{2+}$?

Watch Video Solution

**41.** c) Between $t_{2g}$ and $e_g$ sets of d-orbitals of a central metal in an octahedral complex, which set has higher energy?

Watch Video Solution

**42.** Calculate the packing efficiency in a simple cubic lattice.

Watch Video Solution

**43.** b) An element crystallizes in a foc lattice. The edge length of the unit cell is 400 pm. Calculate the density of the unit cell. $\left(\text{molar mass} = 60\ \text{g mol}^{-1}\right)$

$\left(\text{Avogadro number} = 6.02 \times 10^{23}\right)$

Watch Video Solution

**44.** a) 24 g of a non-volatile, non-electrolyte solute is added to 600 g of water. The boiling point of the resulting solution is 373.35K. Calculate the molar mass of the solute $\left(\text{Given boiling point of pure water} = 373\ \text{K and Kb for water}=0.52\ \text{K kg m}\right.$

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**45.** b) i) A non ideal solution has $\Delta H_{\text{mixing}} > 0$. What type of deviation does it show from Raoult's law?

ii) What is an azeotrope?

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**46.** b) i) A non ideal solution has $\Delta H_{\text{mixing}} > 0$. What type of deviation does it show from Raoult's law?

ii) What is an azeotrope?

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**47.** a) Calculate the e.m.f. of the cell represented below:

$Ni_{(s)} \left| Ni^{2+}_{0.1M} \right| \mid Ag^{+}_{0.01M} \left| Ag_{(s)} \right.$ at 298 Given, $E^{\circ}_{\text{cell}} = 1.05V$,

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**48.** What is the composition of the cathode in the lead storage battery?

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**49.** Name the product discharged at the anode during the electrolysis of an aqueous solution of sodium chloride.

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**50.** Derive an integrated rate equation for the rate constant of a first-order reaction.

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**51.** b) In the equation, rate $= Z_{AB} \times e^{\frac{Ea}{R}}$, what does the term $e^{\frac{Ea}{RT}}$ represent?

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**52.** What is the effect of a catalyst on $\Delta G$ of a reaction?

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**53.** i) What type of adsorption involves Van der Waals force of attraction?

ii) Give an example for homogeneous catalysis.

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**54.** Give an example for homogenous catalysis.

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**55.** What is peptization ? Give an example.

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**56.** i) What is peptization?

ii) What is the dispersed phase in a gel?

iii) Which one of the following electrolyte is required in the smallest quantity to precipitate a negative sol? $MgCl_2$. $AICl_3$, $NaCl$.

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**57.** i) What is peptization?

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**58.** Discuss the mechanism of hydrolysis of tert - butyl bromide.

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**59.** Identify the missing reactant/product in each of the following:

i) $2-$ Bromopentane $+ alc.\ KOH \rightarrow A + KBr$ (where A is the

major product)

ii) $2'B' + 2Na \xrightarrow{\text{dry either}} C_4H_{10} + 2NaBr$

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**61.** Write the equations involved in the preparation of phenol from cumene.

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**62.** i) Give the IUPAC name of the product formed when tertiary butyl alcohol is passed over copper heated to 573 K.

ii) Arrange the following in the increasing order of acidity and justify the same: $(CH_3)_3COH, CH_3OH, (CH_3)_2CHOH$

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**63.** i) Give the IUPAC name of the product formed when tertiary butyl alcohol is passed over copper heated to 573 K.

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**64.** Explain Stephen's reduction with an example.

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**65.** Complete the following equations:

i) $2HCHO + \quad \text{conc. KOH} \rightarrow$

ii) $CH_3CHO + NH_2OH \rightarrow$

iii) $CH_3COOH + PCl_5 \rightarrow$

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**66.** Complete the following equations:

$CH_3CHO + NH_2OH \rightarrow$

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**67.** Complete the following equations:

$CH_3COOH + PCl_5 \rightarrow$

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**68.** Explain Hoffmann bromamide degradation reaction and write the general equation for the reaction involved.

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**69.** i) Give reason: Aniline is a weaker base than ammonia.

ii) $C_6H_5NH_2 \xrightarrow[HCl\,,273K]{NaNO_2} X \xrightarrow[HCl]{Cu_2Cl_2} Y.$

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ii) $C_6H_5NH_2 \xrightarrow[HCl\,,273K]{NaNO_2} X \xrightarrow[HCl]{Cu_2Cl_2} Y.$

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**71.** Write the Haworth structure of D - sucrose. Why is a non - reducing sugar?

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**72.** i) How many peptide bonds are in a hexapeptide?

ii) Write the general structure of the Zwiter ionic form of an $\alpha -$ amino acid.

iii) Deficiency of which vitamin cause pernicious anemia?

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**75.** i) Name the polymer whose partial structure is represented by

ii) What are the monomers of Nylon 6, 6 ?

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**76.** i) Name the catalyst used in the manufacture of high density polythene.

ii) What is the configuration at the carbon - carbon double bonds in natural rubber ?

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