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CHEMISTRY

Strictly based on the **Latest CBSE Syllabus Issued on 15th March 2018** for Academic Year 2018-19

CLASS 12

Strictly based on Latest CBSE curriculum issued on 15th March, 2018 for the Academic Year 2018-19

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CBSE CLASS 12

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CONTENTS

- In each chapter, for better understanding, questions have been classified according to the typology issued by CBSE as :
  R - ***Remembering***, U - ***Understanding,***
  K - ***Knowledge*** A - ***Application.***

●●

Latest Syllabus for Academic Year 2018-19
Chemistry (043)
Class XII

Total Periods (Theory 160 + Practical 60)

One Paper **Time : 3 Hours** **70 Marks**

Unit No.	Title	No. of Periods	Marks
Unit I	Solid State	10	23
Unit II	Solutions	10	
Unit III	Electrochemistry	12	
Unit IV	Chemical Kinetics	10	
Unit V	Surface Chemistry	08	
Unit VI	General Principles and Processes of Isolation of Elements	08	19
Unit VII	*p*-Block Elements	12	
Unit VIII	*d*- and *f*- Block Elements	12	
Unit IX	Co-ordination Compounds	12	
Unit X	Haloalkanes and Haloarenes	10	28
Unit XI	Alcohols, Phenols and Ethers	10	
Unit XII	Aldehydes, Ketones and Carboxylic Acids	10	
Unit XIII	Organic Compounds containing Nitrogen	10	
Unit XIV	Biomolecules	12	
Unit XV	Polymers	08	
Unit XVI	Chemistry in Everyday Life	06	
	Total	**160**	**70**

Unit I : Solid State **10 Periods**

Classification of solids based on different binding forces: molecular, ionic, covalent and metallic solids, amorphous and crystalline solids (elementary idea). Unit cell in two dimensional and three dimensional lattices, calculation of density of unit cell, packing in solids, packing efficiency, voids, number of atoms per unit cell in a cubic unit cell, point defects, electrical and magnetic properties.

Band theory of metals, conductors, semiconductors and insulators and *n* and *p* type semiconductors.

Unit II : Solutions **10 Periods**

Types of solutions, expression of concentration of solutions of solids in liquids, solubility of gases in liquids, solid solutions, colligative properties - relative lowering of vapour pressure, Raoult's law, elevation of boiling point, depression of freezing point, osmotic pressure, determination of molecular masses using colligative properties, abnormal molecular mass, Van't Hoff factor.

Unit III : Electrochemistry **12 Periods**

Redox reactions, conductance in electrolytic solutions, specific and molar conductivity, variations of conductivity with concentration, Kohlrausch's Law, electrolysis and law of electrolysis (elementary idea), dry cell-electrolytic cells and Galvanic cells, lead accumulator, EMF of a cell, standard electrode potential, Nernst equation and its application to chemical cells, Relation between Gibbs energy change and EMF of a cell, fuel cells, corrosion.

Unit IV : Chemical Kinetics **10 Periods**

Rate of a reaction (Average and instantaneous), factors affecting rate of reaction: concentration, temperature, catalyst; order and molecularity of a reaction, rate law and specific rate constant,integrated rate equations and half life (only for zero and first order reactions), concept of collision theory (elementary idea, no mathematical treatment). Activation energy, Arrhenious equation.

Unit V : Surface Chemistry **08 Periods**

Adsorption - physisorption and chemisorption, factors affecting adsorption of gases on solids, catalysis, homogenous and heterogenous activity and selectivity; enzyme catalysis colloidal state distinction between true solutions, colloids and suspension; lyophilic, lyophobic multi-molecular and macromolecular colloids; properties of colloids; Tyndall effect, Brownian movement, electrophoresis, coagulation, emulsion - types of emulsions.

Unit VI : General Principles and Processes of Isolation of Elements **08 Periods**

Principles and methods of extraction - concentration, oxidation, reduction - electrolytic method and refining; occurrence and principles of extraction of aluminium, copper, zinc and iron.

Unit VII : Some "p"-Block Elements **12 Periods**

Group -15 Elements: General introduction, electronic configuration, occurrence, oxidation states, trends in physical and chemical properties; Nitrogen preparation properties and uses; compounds of Nitrogen, preparation and properties of Ammonia and Nitric Acid, Oxides of Nitrogen (Structure only); Phosphorus - allotropic forms, compounds of Phosphorus: Preparation and Properties of Phosphine, Halides and Oxoacids (elementary idea only).

Group 16 Elements: General introduction, electronic configuration, oxidation states, occurrence, trends in physical and chemical properties, dioxygen: Preparation, Properties and uses, classification of Oxides, Ozone, Sulphur -allotropic forms; compounds of Sulphur: Preparation Properties and uses of Sulphur-dioxide, Sulphuric Acid: industrial process of manufacture, properties and uses; Oxoacids of Sulphur (Structures only).

Group 17 Elements: General introduction, electronic configuration, oxidation states, occurrence, trends in physical and chemical properties; compounds of halogens, Preparation, properties and uses of Chlorine and Hydrochloric acid, interhalogen compounds, Oxoacids of halogens (structures only).

Group 18 Elements: General introduction, electronic configuration, occurrence, trends in physical and chemical properties, uses.

Unit VIII : "d" and "f" Block Elements **12 Periods**

General introduction, electronic configuration, occurrence and characteristics of transition metals, general trends in properties of the first row transition metals - metallic character, ionization enthalpy, oxidation states, ionic radii, colour, catalytic property, magnetic properties, interstitial compounds, alloy formation, preparation and properties of $K_2Cr_2O_7$ and $KMnO_4$.

Lanthanoids - Electronic configuration, oxidation states, chemical reactivity and lanthanoid contraction and its consequences.

Actinoids - Electronic configuration, oxidation states and comparison with lanthanoids.

Unit IX : Coordination Compounds **12 Periods**

Coordination compounds - Introduction, ligands, coordination number, colour, magnetic properties and shapes, IUPAC nomenclature of mononuclear coordination compounds. Bonding, Werner's theory, VBT, and CFT; structure and stereoisomerism, importance of coordination compounds (in qualitative inclusion, extraction of metals and biological system).

Unit X : Haloalkanes and Haloarenes. **10 Periods**

Haloalkanes: Nomenclature, nature of C -X bond, physical and chemical properties, mechanism of substitution reactions, optical rotation.

Haloarenes: Nature of C -X bond, substitution reactions (Directive influence of halogen in monosubstituted compounds only).

Uses and environmental effects of - dichloromethane, trichloromethane, tetrachloromethane, iodoform, freons, DDT.

Unit XI : Alcohols, Phenols and Ethers **10 Periods**

Alcohols: Nomenclature, methods of preparation, physical and chemical properties (of primary alcohols only), identification of primary, secondary and tertiary alcohols, mechanism of dehydration, uses with special reference to methanol and ethanol.

Phenols: Nomenclature, methods of preparation, physical and chemical properties, acidic nature of phenol, electrophillic substitution reactions, uses of phenols.

Ethers: Nomenclature, methods of preparation, physical and chemical properties, uses.

Unit XII : Aldehydes, Ketones and Carboxylic Acids **10 Periods**

Aldehydes and Ketones: Nomenclature, nature of carbonyl group, methods of preparation, physical and chemical properties, mechanism of nucleophilic addition, reactivity of alpha hydrogen in aldehydes: uses.

Carboxylic Acids: Nomenclature, acidic nature, methods of preparation, physical and chemical properties; uses.

Unit XIII : Organic compounds containing Nitrogen **10 Periods**

Amines: Nomenclature, classification, structure, methods of preparation, physical and chemical properties, uses, identification of primary, secondary and tertiary amines.

Cyanides and Isocyanides - will be mentioned at relevant places in text.

Diazonium salts: Preparation, chemical reactions and importance in synthetic organic chemistry.

Unit XIV : Biomolecules **12 Periods**

Carbohydrates - Classification (aldoses and ketoses), monosaccahrides (glucose and fructose), D-L configuration oligosaccharides (sucrose, lactose, maltose), polysaccharides (starch, cellulose, glycogen); Importance of carbohydrates.

Proteins -Elementary idea of - amino acids, peptide bond, polypeptides, proteins, structure of proteins -primary, secondary, tertiary structure and quaternary structures (qualitative idea only), denaturation of proteins; enzymes. Hormones - Elementary idea excluding structure.

Vitamins - Classification and functions.

Nucleic Acids: DNA and RNA.

Unit XV : Polymers **08 Periods**

Classification - natural and synthetic, methods of polymerization (addition and condensation), copolymerization, some important polymers: natural and synthetic like polythene, nylon polyesters, bakelite, rubber. Biodegradable and non-biodegradable polymers.

Unit XVI : Chemistry in Everyday life **06 Periods**

Chemicals in medicines - analgesics, tranquilizers antiseptics, disinfectants, antimicrobials, antifertility drugs, antibiotics, antacids, antihistamines.

Chemicals in food - preservatives, artificial sweetening agents, elementary idea of antioxidants.

Cleansing agents- soaps and detergents, cleansing action.

PRACTICALS

Evaluation Scheme for Examination	Marks
Volumetric Analysis	08
Salt Analysis	08
Content Based Experiment	06
Project work	04
Class record and viva	04
Total	**30**

PRACTICALS SYLLABUS **60 Periods**

Micro-chemical methods are available for several of the practical experiments.

Wherever possible, such techniques should be used.

A. Surface Chemistry

(a) Preparation of one lyophilic and one lyophobic sol
Lyophilic sol - starch, egg albumin and gum
Lyophobic sol - aluminium hydroxide, ferric hydroxide, arsenous sulphide.

(b) Dialysis of sol-prepared in (a) above.

(c) Study of the role of emulsifying agents in stabilizing the emulsion of different oils.

B. Chemical Kinetics

(a) Effect of concentration and temperature on the rate of reaction between Sodium Thiosulphate and Hydrochloric acid.

(b) Study of reaction rates of any one of the following:

(i) Reaction of Iodide ion with Hydrogen Peroxide at room temperature using different concen ration of Iodide ions.

(ii) Reaction between Potassium Iodate, (KIO_3) and Sodium Sulphite: (Na_2SO_3) using starch solution as indicator (clock reaction).

C. Thermochemistry

Any one of the following experiments

i) Enthalpy of dissolution of Copper Sulphate or Potassium Nitrate.

ii) Enthalpy of neutralization of strong acid (HCI) and strong base (NaOH).

iii) Determination of enthaply change during interaction (Hydrogen bond formation) between Acetone and Chloroform.

D. Electrochemistry

Variation of cell potential in $Zn/Zn^{2+}||Cu^{2+}/Cu$ with change in concentration of electrolytes ($CuSO_4$ or $ZnSO_4$)at room temperature.

E. Chromatography

i) Separation of pigments from extracts of leaves and flowers by paper chromatography and determination of Rf values.

ii) Separation of constituents present in an inorganic mixture containing two cations only (constituents having large difference in Rf values to be provided).

F. Preparation of Inorganic Compounds

i) Preparation of double salt of Ferrous Ammonium Sulphate or Potash Alum.

ii) Preparation of Potassium Ferric Oxalate.

G. Preparation of Organic Compounds

Preparation of any one of the following compounds

i) Acetanilide ii) Di -benzal Acetone

iii) p-Nitroacetanilide iv) Aniline yellow or 2 - Naphthol Aniline dye.

H. Tests for the functional groups present in organic compounds :

Unsaturation, alcoholic, phenolic, aldehydic, ketonic, carboxylic and amino (Primary) groups.

I. Characteristic tests of carbohydrates, fats and proteins in pure samples and their detection in given food stuffs.

J. Determination of concentration/ molarity of $KMnO_4$ solution by titrating it against a standard solution of :

i) Oxalic acid, ii) Ferrous Ammonium Sulphate

(Students will be required to prepare standard solutions by weighing themselves).

K. Qualitative analysis

Determination of one cation and one anion in a given salt.

Cation - Pb^{2+}, Cu^{2+}, As^{3+}, Al^{3+}, Fe^{3+}, Mn^{2+}, Zn^{2+}, Cu^{2+}, Co^{2+}, Ni^{2+}, Ca^{2+}, Sr^{2+}, Ba^{2+}, Mg^{2+},NH_4^+

Anions - $[Co_3]^{2-}$, S^{2-}, $[SO_3]^{2-}$, $[SO_4]^{2-}$, $[NO_2]^-$ Cl^-, Br^-, I^-, PO_4^{3-} $C_2O_4^{2-}$ CH_3COO^-

(**Note:** Insoluble salts excluded)

PROJECT

Scientific investigations involving laboratory testing and collecting information from other sources.

A few suggested Projects.

- Study of the presence of oxalate ions in guava fruit at different stages of ripening.
- Study of quantity of casein present in different samples of milk.
- Preparation of soybean milk and its comparison with the natural milk with respect to curd formation, effect of temperature, etc.
- Study of the effect of Potassium Bisulphate as food preservative under various conditions (temperature, concentration, time, etc.)
- Study of digestion of starch by salivary amylase and effect of pH and temperature on it.
- Comparative study of the rate of fermentation of following materials: wheat flour, gram flour, potato juice, carrot juice, etc.
- Extraction of essential oils present in Saunf (aniseed), Ajwain (carom), Elaichi (cardamom).
- Study of common food adulterants in fat, oil, butter, sugar, turmeric power, chilli powder and pepper.

Note: Any other investigatory project, which involves about 10 periods of work, can be chosen with the approval of the teacher.

QUESTION PAPER DESIGN 2018-19

Class XII (Code No. 043)

Time : 3 hr. **Marks : 70**

S. No.	Typology of Questions	Very Short Answer (VSA) (1 mark)	Short Answer-I (SA-I) (2 marks)	Short Answer-II (SA-II) (3 marks)	Long Answer (LA) (5 marks)	Total Marks	% Weightage
1.	Remembering-(Knowledge based Simple recall questions, to know specific facts, terms, concepts, principles, or theories, Identify, define, or recite, information)	2	1	1	–	7	10%
2.	Understanding-Comprehension -to be familiar with meaning and to understand conceptually, interpret, compare, contrast, explain, paraphrase information)	–	2	4	1	21	30%
3.	Application (Use abstract information in concrete situation, to apply knowledge to new situations, Use given content to interpret a situation, provide an example, or solve a problem)	–	2	4	1	21	30%
4.	High Order Thinking Skills (Analysis & Synthesis-Classify, compare, contrast, or differentiate between different pieces of information, Organize and/or integrate unique pieces of information from a variety of sources)	2	–	1	1	10	14%
5.	Evaluation-(Appraise, judge, and/or justify the value or worth of a decision or outcome, or to predict outcomes based on values)	1	2	2	–	11	16%
	TOTAL	**5×1=5**	**7×2=14**	**12×3=36**	**3×5=15**	**70(27)**	**100%**

QUESTION WISE BREAK UP

Type of Question	Mark per Question	Total No. of Questions	Total Marks
VSA	1	5	05
SA-I	2	7	14
SA-II	3	12	36
LA	5	3	15
Total		27	70

1. *Internal Choice : There is no overall choice in the paper. However, there is an internal choice in one questions of 2 marks weightage, one question of 3 marks weightage and all the three questions of 5 marks weightage.*
2. *The above template is only a sample. Suitable internal variations may be made for generating similar templates keeping the overall weightage to different form of questions and typology of questions same.*

EXAMINATION PAPER	C.B.S.E. 2018 Class–XII Delhi / Outside Delhi	Chemistry

Time allowed : 3 Hours **Max. Marks : 70**

General Instructions :

(i) ***All*** *questions are compulsory.*
(ii) *Questions number* ***1*** *to* ***5*** *are very short answer questions and carry* ***1*** *mark each.*
(iii) *Questions number* ***6*** *to* ***10*** *are short answer questions and carry* ***2*** *marks each.*
(iv) *Questions number* ***11*** *to* ***22*** *are also short answer questions and carry* ***3*** *marks each.*
(v) *Question number* ***23*** *is a value based question and carries* ***4*** *marks.*
(vi) *Questions number* ***24*** *to* ***26*** *are long answer questions and carry* ***5*** *marks each.*
(vii) *Use log tables, if necessary. Use of calculators is* ***not*** *allowed.*

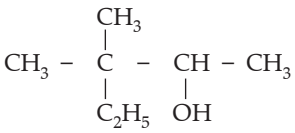
1. Analysis shows that FeO has a non-stoichiometric composition with formula $Fe_{0.95}O$. Give reason. **1**

2. CO (g) and H_2 (g) react to give different products in the presence of different catalysts. Which ability of the catalyst is shown by these reactions ? **1**

3. Write the coordination number and oxidation state of Platinum in the complex $[Pt(en)_2Cl_2]$. **1**

4. Out of chlorobenzene and benzyl chloride, which one gets easily hydrolysed by aqueous NaOH and why ? **1**

5. Write the IUPAC name of the following :



1

6. Calculate the freezing point of a solution containing 60 g of glucose (Molar mass = 180 g mol^{-1}) in 250 g of water. (K_f of water = 1.86 K kg mol^{-1}) **2**

7. For the reaction

$$2N_2O_5\,(g) \longrightarrow 4NO_2\,(g) + O_2\,(g),$$

the rate of formation of NO_2 (g) is 2.8×10^{-3} M s^{-1}. Calculate the rate of disappearance of N_2O_5 (g). **2**

8. Among the hydrides of Group-15 elements, which have the

(a) lowest boiling point ?

(b) maximum basic character ?

(c) highest bond angle ?

(d) maximum reducing character ? **2**

9. How do you convert the following ?

(a) Ethanal to Propanone

(b) Toluene to Benzoic acid **2**

OR

Account for the following :

(a) Aromatic carboxylic acids do not undergo Friedel-Crafts reaction.

(b) pK_a value of 4-nitrobenzoic acid is lower than that of benzoic acid. **2**

10. Complete and balance the following chemical equations :

(a) $Fe^{2+} + MnO_4^- + H^+ \longrightarrow$

(b) $MnO_4^- + H_2O + I^- \longrightarrow$ **2**

11. Give reasons for the following :

(a) Measurement of osmotic pressure method is preferred for the determination of molar masses of macromolecules such as proteins and polymers.

(b) Aquatic animals are more comfortable in cold water than in warm water.

(c) Elevation of boiling point of 1 M KCl solution is nearly double than that of 1 M sugar solution. **3**

12. An element 'X' (At. mass = 40 g mol^{-1}) having f.c.c. structure, has unit cell edge length of 400 pm. Calculate the density of 'X' and the number of unit cells in 4 g of 'X'. ($N_A = 6.022 \times 10^{23}$ mol^{-1}) **3**

13. A first order reaction is 50% completed in 40 minutes at 300 K and in 20 minutes at 320 K. Calculate the activation energy of the reaction. (Given : log 2 = 0.3010, log 4 = 0.6021, R = 8.314 $JK^{-1}mol^{-1}$) **3**

14. What happens when

(a) a freshly prepared precipitate of $Fe(OH)_3$ is shaken with a small amount of $FeCl_3$ solution ?

(b) persistent dialysis of a colloidal solution is carried out ?

(c) an emulsion is centrifuged ? **3**

15. Write the chemical reactions involved in the process of extraction of Gold. Explain the role of dilute NaCN and Zn in this process. **3**

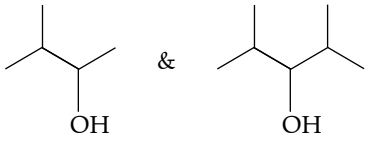
16. Give reasons :

(a) E° value for Mn^{3+}/Mn^{2+} couple is much more positive than that for Fe^{3+}/Fe^{2+}.

(b) Iron has higher enthalpy of atomization than that of copper.

(c) Sc^{3+} is colourless in aqueous solution whereas Ti^{3+} is coloured. **3**

17. **(a)** Identify the chiral molecule in the following pair :



(i) **(ii)**

(b) Write the structure of the product when chlorobenzene is treated with methyl chloride in the presence of sodium metal and dry ether.

(c) Write the structure of the alkene formed by dehydrohalogenation of 1-bromo-1-methylcyclohexane with alcoholic KOH. **3**

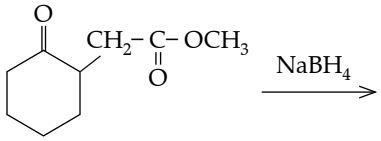
18. (A), (B) and (C) are three non-cyclic functional isomers of a carbonyl compound with molecular formula C_4H_8O. Isomers (A) and (C) give positive Tollens' test whereas isomer (B) does not give Tollens' test but gives positive Iodoform test. Isomers (A) and (B) on reduction with Zn(Hg)/conc. HCl give the same product (D).

(a) Write the structures of (A), (B), (C) and (D).

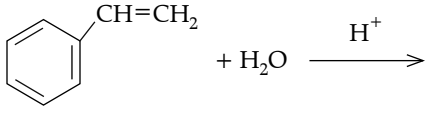
(b) Out of (A), (B) and (C) isomers, which one is least reactive towards addition of HCN ? **3**

19. Write the structures of the main products in the following reactions : **3**

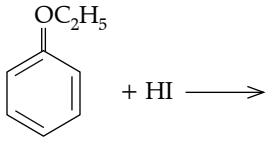
(i)



(ii)



(iii)



20. **(a)** Why is bithional added to soap ?

(b) What is tincture of iodine ? Write its one use.

(c) Among the following, which one acts as a food preservative ?

Aspartame, Aspirin, Sodium Benzoate, Paracetamol **3**

21. Define the following with an example of each :

(a) Polysaccharides

(b) Denatured protein

(c) Essential amino acids **3**

OR

(a) Write the product when D-glucose reacts with conc. HNO_3.

(b) Amino acids show amphoteric behaviour. Why ?

(c) Write one difference between α-helix and β-pleated structures of proteins. **3**

22. **(a)** Write the formula of the following coordination compound :

Iron(III) hexacyanoferrate(II)

(b) What type of isomerism is exhibited by the complex $[Co(NH_3)_5Cl]SO_4$?

(c) Write the hybridisation and number of unpaired electrons in the complex $[CoF_6]^{3-}$. (Atomic No. of Co = 27) **3**

23. Shyam went to a grocery shop to purchase some food items. The shopkeeper packed all the items in polythene bags and gave them to Shyam. But Shyam refused to accept the polythene bags and asked the shopkeeper to pack the items in paper bags. He informed the shopkeeper about the heavy penalty imposed by the government for using polythene bags. The shopkeeper promised that he would use paper bags in future in place of polythene bags.

Answer the following :

(a) Write the values (at least two) shown by Shyam.

(b) Write one structural difference between low-density polythene and high-density polythene.

(c) Why did Shyam refuse to accept the items in polythene bags ?

(d) What is a biodegradable polymer ? Give an example. **4**

24. **(a)** Give reasons :

(i) H_3PO_3 undergoes disproportionation reaction but H_3PO_4 does not.

(ii) When Cl_2 reacts with excess of F_2, ClF_3 is formed and not FCl_3.

(iii) Dioxygen is a gas while Sulphur is a solid at room temperature.

(b) Draw the structures of the following :

(i) XeF_4

(ii) $HClO_3$ **5**

OR

(a) When concentrated sulphuric acid was added to an unknown salt present in a test tube a brown gas (A) was evolved. This gas intensified when copper turnings were added to this test tube. On cooling, the gas (A) changed into a colourless solid (B).

(i) Identify (A) and (B).

(ii) Write the structures of (A) and (B).

(iii) Why does gas (A) change to solid on cooling ?

(b) Arrange the following in the decreasing order of their reducing character :

HF, HCL, HBr, HI

(c) Complete the following reaction :

$XeF_4 + SbF_5 \longrightarrow$ **5**

25. **(a)** Write the cell reaction and calculate the e.m.f. of the following cell at 298 K :

Sn (s) | Sn^{2+} (0.004 M) || H^+ (0.020 M) | H_2 (g) (1 bar) | Pt (s)

(Given : $E^\circ_{Sn^{2+}/Sn} = -0.14V$)

(b) Give reasons :

(i) On the basis of E° values, O_2 gas should be liberated at anode but it is Cl_2 gas which is liberated in the electrolysis of aqueous NaCl.

(ii) Conductivity of CH_3COOH decreases on dilution. **5**

OR

(a) For the reaction

$2AgCl(s) + H_2(g)\ (1\ atm) \longrightarrow 2Ag(s) + 2H^+\ (0.1\ M) + 2Cl^-(0.1\ M)$,

$\Delta G^\circ = -43600\ J$ at 25°C.

Calculate the e.m.f. of the cell.

$[\log 10^{-n} = -n]$

(b) Define fuel cell and write its two advantages. **5**

26. **(a)** Write the reactions involved in the following :

(i) Hofmann bromamide degradation reaction

(ii) Diazotisation

(iii) Gabriel phthalimide synthesis

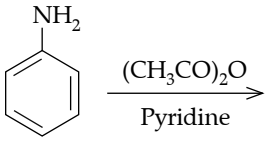
(b) Give reasons :

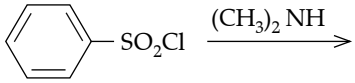
(i) $(CH_3)_2NH$ is more basic than $(CH_3)_3N$ in an aqueous solution.

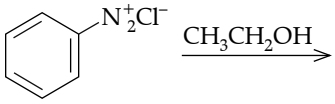
(ii) Aromatic diazonium salts are more stable than aliphatic diazonium salts. **3+2=5**

OR

(a) Write the structures of the main products of the following reactions :

(i) 

(ii) 

(iii) 

(b) Give a simple chemical test to distinguish between Aniline and N,N-dimethylaniline.

(c) Arrange the following in the increasing order of their pK_b values :

$C_6H_5NH_2$, $C_2H_5NH_2$, $C_6H_5NHCH_3$ **5**

●●

SOLVED PAPER	C.B.S.E. Toppers' Answers 2017 Outside Delhi Set-II Class-XII	Chemistry

Time : 3 Hours **Max. Marks : 70**

General Instructions :

(i) ***All*** *questions are compulsory.*
(ii) *Questions number* ***1*** *to* ***5*** *are very short answer questions and carry* ***1*** *mark each.*
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(vi) *Questions number* ***24*** *to* ***26*** *are long answer questions and carry* ***5*** *marks each.*
(vii) *Use log tables, if necessary. Use of* ***calculators*** *is* ***not*** *allowed.*

1. What is the effect of adding a catalyst on.
(a) Activation energy (E_a), and
(b) Gibbs energy (ΔG) of a reaction ? **1**

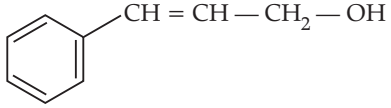
Ans. (1) (a) On adding a catalyst, activation energy decreases

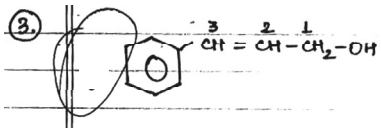
(b) Gibb's energy (ΔG) of the reaction remains the same, on adding a catalyst.

2. What type of colloid is formed when a solid is dispersed in a liquid ? Give an example. **1**

Ans. (2.) A sol is formed when a solid is dispersed in a liquid.
Example – Cell fluids, paints, Gold sol, etc.

3. Write the IUPAC name of the following compound : **1**

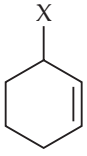


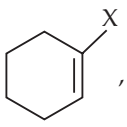
Ans. (3.) 

IUPAC Name :- 3-Phenyl prop-2-en-1-ol

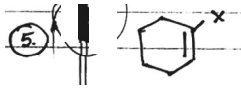
4. Write the formula of the compound of sulphur which is obtained when conc. HNO_3 oxidises S_8. **1**

Ans. (4.) H_2SO_4 is obtained when conc. HNO_3 oxidises S_8.

5. Out of 

and 

, which is an example of Vinylic halide ? **1**

Ans. (5.) 

is an example of vinylic halide.

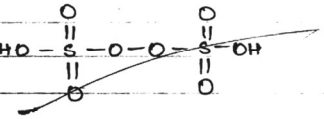
6. Using IUPAC norms write the formulae for the following :
(a) Tris (ethane-1, 2-diamine) chromium (III) chloride
(b) Potassium tetrahydroxozincate (II) **2**

Ans. (a) The formula of the given compound is → $[Cr(en)_3]Cl_3$

(b) The formula of the given compound is → $K_2[Zn(OH)_4]$

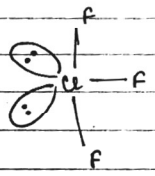
7. Draw the structures of the following :
(a) $H_2S_2O_8$
(b) ClF_3 **2**

Ans. (a)



$H_2S_2O_8$ (Peroxodisulphuric acid),

(b)



Bent-T-shape.

8. Write the name of the cell which is generally used in inverters. Write the reactions taking place at the anode and the cathode of this cell. **2**

Ans. (a) Lead storage battery is generally used in inverters.

(b) Reaction taking Place at →

(i) Anode

$$SO_4^{2-} + Pb \longrightarrow PbSO_4 + 2e^-$$

(ii) Cathode

$$PbO_2 + SO_4^{2-} + 4H^+ + 2e^- \longrightarrow PbSO_4 + 2H_2O$$

9. Calculate the number of unit cells in 8.1 g of aluminium if it crystallizes in a face-centred cubic (f.c.c.) structure. (Atomic mass of Al = 27 g mol^{-1}) **2**

Ans. Aluminium crystallises in f.c.c. structure

∴ no. of atoms in 1 unit cell, Z = 4

given mass of Al = 8.1 g

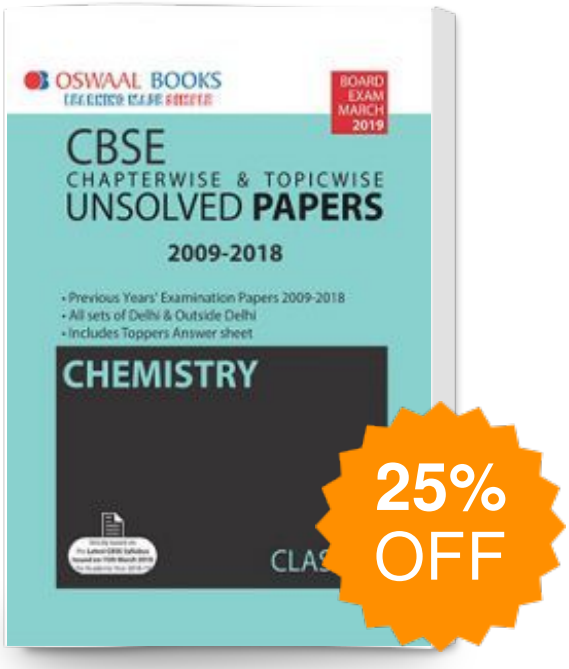
Molar mass of Al = 27 g mol^{-1}

$$\therefore \text{no. of moles} = \frac{\text{Given mass}}{\text{Molar mass}} = \frac{8.1}{27} \times \frac{1}{10}$$

$$= \frac{81 \times 3}{27 \times 10} = 0.3 \text{ mol}$$

∴ no. of atoms of Al = no. of moles × Avogadro's no.

Oswaal CBSE Chapterwise & Topicwise Unsolved Papers Class - XII Chemistry For 2019 Exam



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