

A Valuable material from SS PRITHVI's

Class 11

2023-24



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CLASSIFICATION OF QUESTIONS

SUBJECT:

CHEMISTRY

MR. SS PRITHVI

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WHAT IS / DEFINE

1. What is relative atomic mass
2. define mole define Avogadro number what is molar mass
3. define gram equivalent mass
4. what is stoichiometry
5. what are limiting reagents
6. what is oxidation number
7. what are redox reactions
8. what is combination reaction
9. define acidity and basicity
10. Define principle quantum number
11. Define Azimuthal quantum number
12. Define magnetic quantum number
13. Define spin quantum number
14. what is exchange energy
15. define orbital
16. what is effective nuclear charge
17. what is Ionic radius
18. define ionization energy
19. what is electron affinity
20. what is electronegativity
21. what is diagonal relationship
22. define iso electronic ions
23. what is screening effect
24. what are f block elements
25. define valency
26. what are ortho and para hydrogen
27. what are isotopes of Hydrogen
28. define covalent hydrides
29. What is intra molecular and
30. intermolecular hydrogen bonding
31. Define water gas shift reaction
32. What is syn gas
33. what are s block elements
34. what is boyles temperature
35. what is inversion temperature
36. what is compressibility factor
37. what are intensive and extensive properties
38. define state and path function
39. what is entropy
40. what is enthalpy of combustion
41. define molar heat capacity
42. what is calorific value of food
43. define enthalpy of neutralization
44. what is lattice Energy
45. define spontaneous reaction
46. What is homogeneous equilibrium

47. what is heterogeneous equilibrium
48. what is equilibrium constant
49. define molarity, molality, normality and formality
50. define parts-per million PPM
51. what are ideal solutions
52. define non ideal solutions
53. what is Osmosis
54. what is osmotic pressure
55. define isotonic solutions
56. define reverse osmosis
57. define vant hoff factor
58. what is covalent bond
59. what is electrovalent Bond
60. what is co-ordinate covalent bond
61. define Bond length
62. defined bond order
63. define bond angle
64. define Bond enthalpy
65. what is dipole moment
66. define hybridization
67. what is reaction quotient
68. what do you mean by vapour pressure of liquid
69. define relative lowering of vapour pressure
70. define solubility
71. what are the factors affecting solubility

LAWS/SCIENTISTS PROPOSALS

1. List out the postulates of bohr atom model
2. derive De Broglie equation
3. Heisenberg uncertainty principle schrodinger wave equation
4. Aufbau principle
5. pauli exclusion principle
6. Hunds rule
7. modern periodic law
8. pauling method
9. slaters rule
10. solvay process
11. Boyles law
12. Charles law
13. Avogadro law
14. Gay luussac law

15. Graham's law of diffusion
16. Dalton's law of partial pressure
17. Joule Thomson effect
18. First law of thermodynamics
19. Various statements of second law of thermodynamics
20. 3rd law of thermodynamics
21. Zeroth law of thermodynamics
22. Characteristics of internal energy
23. Bomb calorimeter
24. Law of mass action
25. Le Chatelier's principle
26. Henry's law
27. Raoult's law
28. Van't Hoff factor (lesson 9)
29. Octet rule
30. Fajans' rules

REASONING TYPE

1. Halogen acts as oxidizing agents
2. Hydrogen is not placed with halogens
3. Interstitial hydrides have lower density than parent metal
4. NH_3 has exceptionally high melting and boiling point
5. Sodium hydroxide is more water soluble than sodium chloride
6. Alkaline earth metals are harder than alkali earth metals
7. Which has high melting point Mg(OH)_2 or MgF_2 , explain
8. Ca(OH)_2 can't be used to remove permanent hardness
9. Why H_2O_2 is not stored in plastic containers
10. Why Ca(OH)_2 is used in whitewashing
11. All reasoning questions in lesson 6
12. Why chemical equilibrium is dynamic equilibrium
13. Effect of adding a gas at equilibrium reaction at equal volume
14. Effect of pressure on solubility

SHAPES AND STRUCTURES

1. s orbital
2. p orbital
3. d orbital
4. f orbital
5. Ortho hydrogen
6. Para hydrogen
7. Structure of H_2O
8. Structure of H_2O_2
9. Carbonate ion and its resonance
10. Dipole moment in carbon dioxide and water
11. Structure of IF_7
12. Structure of SF_6

ELECTRONIC CONFIGURATIONS

1. Ni^{2+} and Fe^{3+}
2. Chromium 24
3. Copper 29
4. Mn^{2+} and Cr^{3+}
5. Alkali metals
6. Alkaline earth metals
7. Lanthanides
8. Actinides
9. General electronic configurations of all block elements

DERIVATION

1. Derive the time independent Schrödinger wave equation
2. Derive the critical constants in terms of van der Waals
3. Pauling method of finding ionic radius
4. Relation between ΔH and ΔU
5. Derive ideal gas equation
6. Relation between C_P and C_V
7. Relation between K_P and K_C
8. Van't Hoff equation
9. Relative lowering of vapour pressure

DIFFERENCE BETWEEN AND SIMILARITIES

1. Molecular mass and molar mass
2. orbit and orbital
3. oxidation and reduction
4. Lithium and are other elements comparison
5. Lithium and magnesium similarities
6. beryllium and other elements comparison
7. beryllium and Aluminium similarities
8. temporary and permanent hardness
9. diffusion and effusion
10. ideal gases and real gases
11. intensive and extensive properties
12. state and path functions
13. Homogeneous and heterogeneous equilibrium
14. sigma bond and Pi bond

PREPARATION

1. Preparation of hydrogen using electricity
2. preparation of protium
3. preparation of deuterium
4. preparation of tritium
5. preparation of plaster of paris
6. lab methods of preparation of hydrogen
7. how is bleaching powder prepared
8. liquification of gases methods

USES/ APPLICATIONS

1. Uses of heavy water
2. uses of deuterium
3. uses of plaster of paris
4. uses of gypsum
5. uses of common salt
6. uses of sodium hydroxide
7. biological importance of magnesium and Calcium
8. uses of magnesium
9. Applications of equilibrium constant

LIMITATIONS

1. Bohr atom model
2. Limitations of Henry's law

THEORIES IN VOLUME 2

(Organic not involved)

1. how to write KP and KC for heterogeneous equilibrium
2. Name and define all colligative properties
3. valence shell electron pair theory
4. valence bond theory
5. Molecular orbital theory
6. linear combination of atomic orbitals
7. types of polymerization in diethylene

ORGANIC

What is type

1. homologous series
2. functional group
3. geometrical isomerism
4. optical isomerism
5. tautomerism
6. metamerism
7. aromaticity or huckle rule
8. Ortho and para directing groups
9. meta directing groups
10. Toxicity in Benzene
11. vicinal di halides
12. gem di halides

General formula

1. alkanes
2. alkenes
3. alkynes
4. Alkadiene
5. aliphatic monohydric alcohol
6. aliphatic ketones
7. aliphatic amines

Uses

1. uses of alkanes
2. uses of alkenes
3. uses of alkynes
4. uses of chloroform
5. uses of iodoform
6. uses of carbon tetrachloride

7. uses of chlorobenzene uses of freons
8. uses of DDT

Important functional groups

1. alcohol
2. Ether
3. aldehyde
4. Ketone
5. carboxylic acid
6. Ester
7. nitro alkene
8. Amine
9. Cyanide
10. phenol
11. alkyl
12. aryl
13. nitroso
14. thionyl
15. sulphonyl
16. order of precedence of functional group page number 119

Difference between

1. homolytic cleavage and heterolytic cleavage
2. nucleophiles and electrophiles
3. Primary secondary and tertiary haloalkane
4. SN1 and SN2
5. E1 and E2

Reasoning type

- + why did cut apple turns brown?
- + Water destroys Grignard reagents why?
- + Is it possible to prepare methane by Kolbe's Electrolytic method
- + Why ethane is produced in chlorination of methane?
- + Why benzene undergoes electrophilic substitution reaction whereas alkenes undergoes addition reaction?
- + Toluene undergoes nitration easily than benzene. Why?
- + neo-pentyl bromide undergoes nucleophilic substitution reactions very slowly - justify.
- + Why Grignard reagent should be prepared in anhydrous condition?
- + Haloalkanes undergo nucleophilic substitution reaction whereas haloarenes

undergo electrophilic substitution reaction.
comment.

- + Chloroform is kept with a little ethyl alcohol in a dark coloured bottle why?
- + Why is the use of DDT banned in most of the countries?
- + Why chlorination of methane is not possible in dark?
- + Give reasons for polarity of C-X bond in halo alkane.
- + Why is it necessary to avoid even traces of moisture during the use of Grignard reagent?

Effects

1. positive and negative inductive effect
2. positive and negative electromeric effect
3. resonance or mesomeric effect both positive and negative
4. hyperconjugation
5. peroxide effect

Classification / types

1. organic compounds
2. types of isomerism
3. types of plastics

PREPARATION

- + methane from sodium salt of fatty acid
- + Alkane from sodium or potassium salt of fatty acid
- + alkane from haloalkanes using nascent hydrogen
- + alkene from dehydration of alcohol
- + alkenes from alkynes
- + alkenes by dehydro halogenation of haloalkanes
- + alkenes from vicinal Di halides
- + ethene by kolbe's electrolytic method
- + vicinal diols using bayers reagent
- + Ozonide from gemdihalides
- + industrial preparation of Ethyne
- + alkanes from Grignard reagent
- + benzene from decarboxylation of aromatic acid
- + benzene from phenol
- + benzene using Wurtz fittig reaction or haloarenes
- + benzene by friedel crafts reaction or halo alkanes
- + n propyl iodide from n propyl Bromide
- + halo alkenes from alcohols
- + halo alkenes from Lucas reagent
- + haloalkenes using thionyl chloride
- + iodomethane from haloalkanes or finklestein reaction
- + fluoroalkanes from chloro or bromoalkane, swarts reaction
- + bromo Ethane from silver salt of fatty acid or hunsdicker reaction

- + preparation of Primary secondary and tertiary alcohols
- + Ketone from acid chloride using Grignard reagent
- + halo arenes using Benzene
- + diazonium chloride or sandmeyer's reaction
- + fluorene from Benzene
- + diazonium chloride Balz sch emann and reaction
- + commercial preparation of chlorobenzene, rashchig process
- + aromatic nucleophilic substitution of haloarenes Dows process
- + benzene from halo arene
- + grignard reagent from haloarenes
- + preparation of chloroform
- + carbylamine reaction of chloroform
- + freons using swarts reaction
- + preparation of DDT

Naming reactions

- + kolbe's electrolytic method
- + wurtz reaction
- + Corey house mechanism
- + alkanes from Grignard reagent
- + bayers reagent
- + markovnikov's rule
- + anti markovnikov's rule peroxide effect karasch addition
- + wurtz fittig reaction
- + friedl crafts reaction
- + birch reduction
- + darjan's halogenations
- + finkelstein reaction
- + Williamson Ether synthesis
- + Balz schemann reaction

Characteristics and properties

- + organic compounds
- + properties of alkanes
- + properties of benzene physical and chemical
- + properties of alkenes
- + properties of alkynes

Reactions

- + example for beta elimination
- + electrophilic substitution
- + aromatication of alkanes
- + karash addition reaction
- + Nitration of benzene
- + halogenation
- + sulphonation
- + electrophilic substitution reaction mechanism of benzene
- + how will you convert ethyl chloride to n butane
- + how will you convert ethyl chloride to Ethane
- + Grignard reagent with water
- + ammonolysis of haloalkanes
- + aromatic nucleophilic substitution reaction of haloarenes
- + chlorination of Methane

Structures

- + structure of benzene (any four structures with diagram)
- + Kekule's structure of benzene

Types of organic reactions

- + substitution reaction with example
- + addition reaction with example
- + elimination reaction with example
- + Oxidation reaction with example
- + rearrangement reactions with example
- + combination reactions with example

Test and estimations

1. nitrogen
2. sulphur
3. Phosphorus
4. Sulphur by carius method
halogens by Carius method
5. Dumas method
6. kjeldahls method
7. test for alkene

Hybridization

- ✚ hybridization of Carbo cation and Carbo anion

Theory

- ✚ distillation
- ✚ steam distillation
- ✚ chromatography
- ✚ conformers of Ethane
- ✚ conformers of n butane

NOTE: STUDY ALL THE IUPAC NAMING AND IUPAC STRUCTURES IN LN. 11,13,14

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COMPLETE THE REACTIONS TYPE

	<p>Show the heterolysis of covalent bond by using curved arrow notation and complete the following equations. Identify the nucleophile in each case.</p> <p>(i) $\text{CH}_3 - \text{Br} + \text{KOH} \rightarrow$</p> <p>(ii) $\text{CH}_3 - \text{OCH}_3 + \text{HI} \rightarrow$</p>
	<p>Write the products A & B for the following reaction.</p> $\text{Cl}-\text{CH}_2-\text{CH}_2-\text{Cl} \xrightarrow[\text{-HCl}]{\text{Alcoholic KOH}} (\text{A}) \xrightarrow[\text{-HCl}]{\text{Alcoholic KOH}} (\text{B})$
	$3 \text{ CH} \equiv \text{CH} \xrightarrow[873 \text{ K}]{\text{Red Hot Iron tube}}$
	$\text{CH} \equiv \text{C}-\text{CH}_3 + \text{H}_2 \xrightarrow{\text{Pt}} ? \xrightarrow{\text{H}_2} ?$

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	<p>Identify the compound A, B, C and D in the following series of reactions</p> $ \begin{array}{ccc} \text{CH}_3\text{-CH}_2\text{-Br} & & \\ \downarrow \text{alc. KOH} & & \\ \text{A} & \xrightarrow{\text{Cl}_2 / \text{CCl}_4} & \text{B} \\ \downarrow \begin{array}{l} \text{i) O}_3 \\ \text{ii) Zn/H}_2\text{O} \end{array} & & \downarrow \text{NaNH}_2 \\ \text{C} & & \text{D} \end{array} $
	<p>An alkylhalide with molecular formula $\text{C}_6\text{H}_{13}\text{Br}$ on dehydro halogenation gave two isomeric alkenes X and Y with molecular formula C_6H_{12}. On reductive ozonolysis, X and Y gave four compounds CH_3COCH_3, CH_3CHO, $\text{CH}_3\text{CH}_2\text{CHO}$ and $(\text{CH}_3)_2\text{CHCHO}$. Find the alkylhalide.</p>
	$ \begin{array}{c} \text{CH}_3 - \text{CH}(\text{CH}_3) - \text{CH}(\text{OH}) - \text{CH}_3 \\ \downarrow \text{H}^+/\text{heat} \\ \text{(A) major product} \xrightarrow{\text{HBr}} \text{(B) major product} \end{array} $ <p>Identify A and B</p>

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	<p>i) 2 - butyne $\xrightarrow{\text{Lindlar Catalyst}}$</p> <p>ii) $\text{CH}_2 = \text{CH}_2 \xrightarrow{\text{I}_2}$</p> <p>iii) $\begin{array}{c} \text{CH}_2 - \text{CH}_2 \\ \quad \quad \\ \text{Br} \quad \quad \text{Br} \end{array} \xrightarrow{\text{Zn/C}_2\text{H}_5\text{OH}}$</p> <p>iv) $\text{CaC}_2 \xrightarrow{\text{H}_2\text{O}}$</p>
	<p>In an experiment ethyl iodide in ether is allowed to stand over magnesium pieces. Magnesium dissolves and product is formed</p> <p>a) Name the product and write the equation for the reaction.</p> <p>b) Why all the reagents used in the reaction should be dry? Explain</p> <p>c) How is acetone prepared from the product obtained in the experiment.</p>
	<p>Write a chemical reaction useful to prepare the following:</p> <p>i) Freon-12 from Carbon tetrachloride</p> <p>ii) Carbon tetrachloride from carbon disulphide</p>

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	<p>Predict the products when bromoethane is treated with the following</p> <p>i) KNO_2 ii) AgNO_2</p>
	<p>Starting from CH_3MgI, How will you prepare the following?</p> <p>i) Acetic acid ii) Acetone iii) Ethyl acetate iv) Iso propyl alcohol v) Methyl cyanide</p>
	<p>Complete the following reactions</p> <p>i) $\text{CH}_3 - \text{CH} = \text{CH}_2 + \text{HBr} \xrightarrow{\text{Peroxide}}$ ii) $\text{CH}_3 - \text{CH}_2 - \text{Br} + \text{NaSH} \xrightarrow[\text{H}_2\text{O}]{\text{alcohol}}$ iii) $\text{C}_6\text{H}_5\text{Cl} + \text{Mg} \xrightarrow{\text{THF}}$ iv) $\text{CHCl}_3 + \text{HNO}_3 \xrightarrow{\Delta}$ v) $\text{CCl}_4 + \text{H}_2\text{O} \xrightarrow{\Delta}$</p>

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	An organic compound (A) with molecular formula C_2H_5Cl reacts with KOH gives compounds (B) and with alcoholic KOH gives compound (C). Identify (A), (B), and (C)
	Simplest alkene (A) reacts with HCl to form compound (B). Compound (B) reacts with ammonia to form compound (C) of molecular formula C_2H_7N . Compound (C) undergoes carbylamine test. Identify (A), (B), and (C).
	A hydrocarbon C_3H_6 (A) reacts with HBr to form compound (B). Compound (B) reacts with aqueous potassium hydroxide to give (C) of molecular formula C_3H_8O . What are (A) (B) and (C). Explain the reactions.
	Two isomers (A) and (B) have the same molecular formula $C_2H_4Cl_2$. Compound (A) reacts with aqueous KOH gives compound (C) of molecular formula C_2H_4O . Compound (B) reacts with aqueous KOH gives compound (D) of molecular formula $C_2H_6O_2$. Identify (A), (B), (C) and (D).

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	<p>An organic compound (A) C_2H_4 decolourises bromine water. (A) on reaction with chlorine gives (B) A reacts with HBr to give (C). identify (A), (B), (C), Explain the reactions.</p>
	<p>An organic compound (A) on ozonolysis gives only acetaldehyde. (A) reacts with Br_2/CCl_4 to give compound (B) Identify the compound (A) and (B). Write the IUPAC name of (A) and (B). Give the Geometrical isomers of (A)</p>

WRITE THE POSSIBLE ISOMERS OF

- Write the structural formula and carbon skeleton formula for all possible chain isomers of C_6H_{14} (Hexane)
- Draw the structure and write down the IUPAC name for the isomerism exhibited by the molecular formulae:
 C_5H_{10} – Pentene (3 isomers)
 C_6H_{12} – Hexene (5 isomers)
- Draw cis-trans isomers for the following compounds
 - 2- chloro – 2 – butene

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- $\text{CH}_3 - \text{CH} = \text{CH} - \text{CH}_2 - \text{CH}_3$
- Calculate the number of rings present in $\text{C}_{18}\text{H}_{12}$.
- write all possible isomers for an aromatic benzenoid compound having the molecular formula C_8H_{10}
- write all possible isomers for a monosubstituted aromatic benzenoid compound having the molecular formula C_9H_{12}
- Write all possible chain isomers with molecular formula $\text{C}_5\text{H}_{11}\text{Cl}$
- Write down the possible isomers of $\text{C}_5\text{H}_{11}\text{Br}$ and give their IUPAC and common names.