केवल मूल्यांकनकर्ता के उपयोग हेतु!

माध्यमिक शिक्षा मण्डल, मध्यप्रदेश, भोपाल

32 पृष्ठीय

केवल परीक्षक द्वारा भरा जावे। प्रश्न क्रमांक के सम्मुख प्राप्तांकों की प्रविष्टी करें।

प्रश्न क्रमांक	पृष्ठ क्रमांक	प्राप्तांक (अंकों में)	प्रश्न क्रमांक	पृष्ठ क्रमांक	प्राप्तांक (अंकों में)
1			17		
2			18		
3			19		
4			20		
5			21		
6			22		
7			23		
8			24		
9			25		
10			26		
11			27		
12			28		
13					
14					
15					
16					

परीक्षक एवं उपमुख्य परीक्षक द्वारा भरा जावे ↓

→ परीक्षक एवं उपमुख्य परीक्षक द्वारा भरा जावे

प्रमाणित किया जाता है कि अ * के अनुरूप मुख्य पृष्ठ पर अंकों की प्रविष्टी एवं अंव

निर्धारित मुद्राः नाम, पदनाम ...ंक एवं पदांकित संख्या के नाम की मु

उप ...परीक्षक के हस्ता... ...धारित मुद्रा

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②

योग

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Ques = 01

(i.) M ... (M)

(ii.) K ... sec^{-1}

(iii.) Fehl ... solution B (sodium potassium tartarate).

(iv.) Fis ... odour

(v.) Comb ... form

(vi.) tripep ... tide [three amino ...]

Ques = 02

(i.) True

(ii.) False

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(iii.) False

(iv.) False

(v.) True

(vi.) True

Ques=03

A	B
(i.) Silicon	(b.) semiconductor
(ii.) $K_4[Fe(CN)_6]$	(e.) Counter ions
(iii.) Lucas reagent	(d.) Conc. HCl and $ZnCl_2$
(iv.) Formic acid	(c.) Red ants
(v.) Monosaccharides	(a.) Reducing sugars

Ques = 04

(i.) Zero is the value of conductivity of superconductor

(ii.) '$K_2Cr_2O_7$' is the chemical formula of potassium dichromate.

(iii.) 'Ni' (nickel) is the central metal atom in $[Ni(CO)_4]$.

(iv.) Decreasing order of boiling points of given alkyl halides is :-

$$RI > RCl > RBr > RF$$

(v.) 'Testosterone' which comes under steroids is responsible for deep voice in males.

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Ques = 05

(i.) (a.) Solution

(ii.) (c.) 2

(iii.) (c.) Titanium

(iv.) (c.) C_6H_5CHO

(v.) (a.) $NH_2 - CH_2 - CH_2 - NH_2$

(vi.) (c.) Hormones

Ques ⇒ 17

Given :— Kappa (conductivity) ⇒ 4.95×10^{-5} S cm^{-1}

concentration ⇒ 0.001028 mol L^{-1}

(Λ°_m) molar conductivity ⇒ 390.5 S cm^2 mol^{-1}

BSE

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B S E

We know that :-

Rate of dissociation $(\alpha) = \frac{\Lambda^{\circ}_{c}}{\Lambda^{\circ}_{m}}$

$\alpha \Rightarrow \frac{4.95 \times 10^{-5}\ S\,cm^{-1}}{390.5\ S\,cm^{2}\,mol^{-1}}$

$\Rightarrow \frac{495 \times 10^{-5}}{39050}$ (99 / 7810)

$\alpha \Rightarrow 0.12 \times 10^{-6}$

Now,

Dissociation constant$(K) = \frac{c\alpha^2}{1-\alpha}$

$= \frac{0.001028 \times (0.12 \times 10^{-6})^2}{1 - 0.12 \times 10^{-6}}$

$\Rightarrow \frac{0.001028 \times 0.12 \times 0.12 \times 10^{-6} \times 10^{-6}}{0.88 \times 10^{-6}}$

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0.00257
0.00514 0.072

$$\Rightarrow \frac{0.001028 \times 0.0144 \times 10^{-6}}{0.88}$$

0.44 0.22 0.11

$$\Rightarrow \frac{0.00257 \times 0.072 \times 10^{-6}}{0.11}$$

$$\Rightarrow \frac{0.00018504 \times 10^{-6}}{0.11}$$

$$K \Rightarrow 0.000168211 \times 10^{-6}$$ Ans

1.6 82.1

Ques = 18

(i.) $CH_3-CH_2-CH_2-O-CH_3 + HBr \longrightarrow$

ether methoxypropane — halogen acid

$CH_3CH_2CH_2OH$ + CH_3Br

propyl alcohol — methyl bromide

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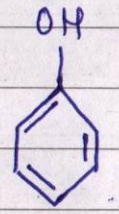
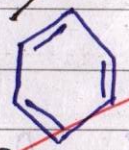
(ii.)



Phenol + Zn dust →  + ZnO

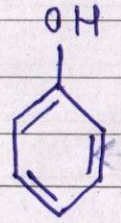
Benzene

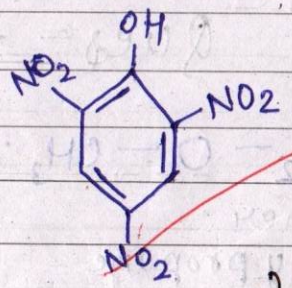
(iii.) $CH_3-CH=CH_2 \xrightarrow{H_2O/H^+} CH_3-\underset{\underset{OH}{|}}{CH}-$

propan-2-ol

★ This is Acid catalyzed Reaction

(iv.)



$\xrightarrow{Conc.HNO_3}$ 

2,4,6-trinitrophenol
(picric acid)

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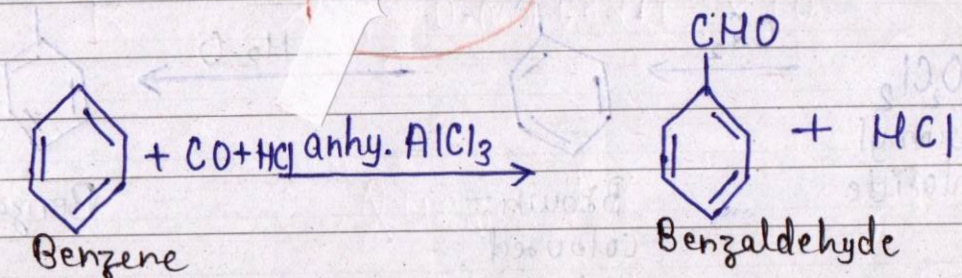
Ques = 19

(i) Gatterman-Koch reaction :-

This reaction is used to prepare benzaldehyde (C_6H_5CHO) by the reaction of benzene with carbon monoxide and hydrochloric acid in the presence of anhydrous aluminium chloride ($AlCl_3$).



This reaction is considered as one of the best method to prepare benzaldehyde. At last HCl is obtained along with C_6H_5CHO.

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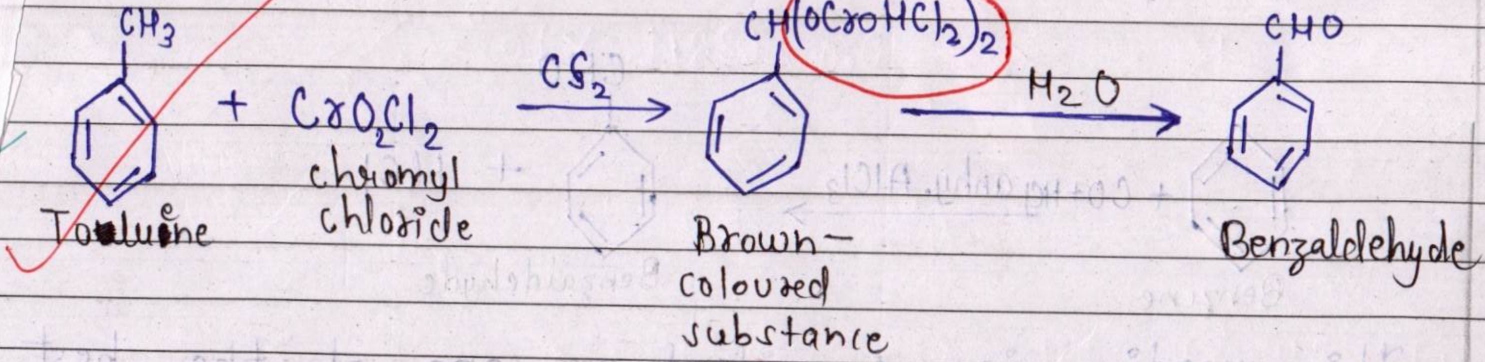
(iii) Etard Reaction :-

This reaction is also used to prepare benzaldehyde. In this reaction, toluene is reacted with chromyl chloride in the presence of CS_2. First an ~~intermediate~~ intermediate compound is formed and then after hydrolysis, benzaldehyde is obtained.



This method is also very important in the preparation of benzaldehyde.

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= 20

Boiling point :– Temperature at which vapour pressure of any liquid becomes equal to atmospheric pressure (1 atm), that temperature of that liquid is known as boiling point of that liquid.

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Elevation in Boiling Point :– When any non-volatile solute is added in any volatile solvent, its vapour pressure decreases. Due to decrease in vapour pressure of solvent, boiling point of solution increases, and this increase in boiling point is called as elevation in boiling point.

It is denoted by ΔT_b

$$\boxed{\Delta T_b = T_b - T_b^\circ}$$

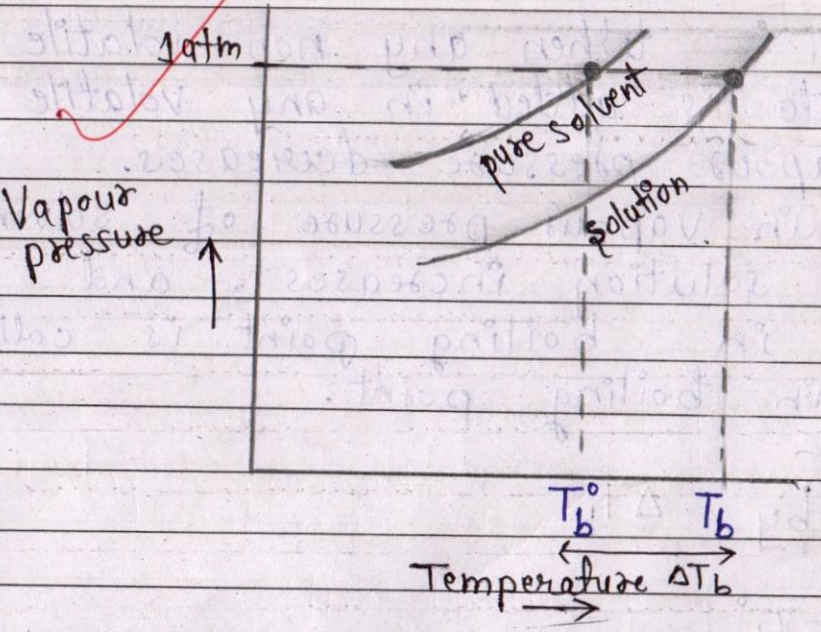
where,

$\Delta T_b \Rightarrow$ elevation is boiling point.

$T_b \Rightarrow$ boiling point of solution

$T_b^\circ \Rightarrow$ boiling point of pure solvent.

$$T_b > T_b^\circ$$



Mathematical expression of molar mass of solute :-

We know that :-

$$\Delta T_b = K_b \times m$$

K_b = molal boiling elevation constant

$$\Delta T_b = K_b \times \frac{W_B \times 1000}{M_B \times W_A}$$

m = molality $\Rightarrow \frac{W_B \times 1000}{M_B \times W_A}$

$$M_B = \frac{K_b \times W_B \times 1000}{\Delta T_b \times W_A}$$

where,

$M_B \Rightarrow$ molar mass of solute
$\Delta T_b \Rightarrow$ elevation in Boiling point
$W_A \Rightarrow$ mass of solvent
$W_B \Rightarrow$ mass of solute
$K_b \Rightarrow$ molal elevation boiling point constant.

Hence, it is proved that elevation in

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boiling point is a colligative property as it depends on number of particles of solute.

Ques=13

Enthalpy of atomisation is the energy required to break any molecule into its constituent atoms.

Enthalpy of atomisation of transition elements are high because transition elements have high melting and high boiling point because of metallic bonds they formed.

As their melting and boiling points are high, more energy

is required to break any molecule into its constituent atoms.

Example:-
TiC is a compound formed by a transition element Ti.

B
S
E

Ques = 14

CCl_4

Three effects of tetrachloromethane (carbon tetrachloride) for humans are:-

(1.) It is responsible for loss of eyesight in many humans, as its use can defect human eye.

(2.) Its inhalation can also cause breathing problems in humans.

(3.) Due to the excessive use of carbon tetrachloride (CCl_4), ozone layer which protects us from harmful Ultraviolet rays is depleting which can result in entry of UV rays in earth's atmosphere can cause skin diseases and many more.

Ques = 15

Hoffmann bromamide degradation is the reaction used to prepare primary amine by reaction of amide with bromine and any strong alkali.

As the name suggests that it leads to loss of one carbon than that present in the amide (degradation),

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because the strong alkali used in the reaction [NaOH/KOH] forms bond with extra carbon present in amide and leads to preparation of only primary amine which consists only one alkyl group.

This is also reason why this reaction only prepares 1° amines.

B
S
E

$R-\overset{O}{\overset{\|}{C}}-NH_2 + Br_2 + 4NaOH \longrightarrow R-NH_2 + Na_2CO_3 + 2NaBr + 2H_2O$

Amide → $R-NH_2$ = 1° amine

...caction :–

Ex :–

$CH_3-\overset{O}{\overset{\|}{C}}-NH_2 + Br_2 + 4NaOH \longrightarrow CH_3-NH_2 + Na_2CO_3 + 2NaBr + 2H_2O$

~~methy~~ ethyl amide → methyl amine (1° amine)

Ques = 16

Three conclusions or characteristics of order of reaction

(1.) Order of reaction is defined as the 'sum of powers of all concentration terms in any rate law equation'.

Ex:- Rate = $-\frac{d[A]}{dt} = K[A]^a[B]^b[C]^c$

where order of reaction is ⇒ a + b + c.

(2.) Order of reaction is a experimental value.

(3.) Order of reaction can be zero, positive, negative, fractional but not more than 3.

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(4.) Order of reaction is derived from rate law equation.

(5.) Order of reaction can be defined for both elementary as well as complex reactions.

B
S
E

Ques=06

Characteristics of interstitial Compounds :-

(1.) Interstitial Compounds are those compounds which are formed when small atoms of non-metals like C, N, O are trapped inside the voids of transition metals crystal lattice.

(2.) Interstitial compounds are ionic in nature.

(3.) Interstitial compounds are formed because of ~~comparatively~~ property of transition elements that they have vacant d- orbital to form bond.

Ex:- TiC

where non-metal Carbon is trapped inside the void of transition metal Titanium (Ti).

Ques=07

Homoleptic Complex :-

The complex in which the central metal atom/ ion is bonded with only one type of donor atom, by co-ordinate bond to form a complex.

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Example

$K_4[Fe(CN)_6]$

In this, 'Fe' central metal atom is bonded with six cyanides only and no other ligand is present.

Ques=08

(i) $K_2[Ni(CN)_4]$

(ii) $[Co(NH_3)_5(CO_3)]Cl$

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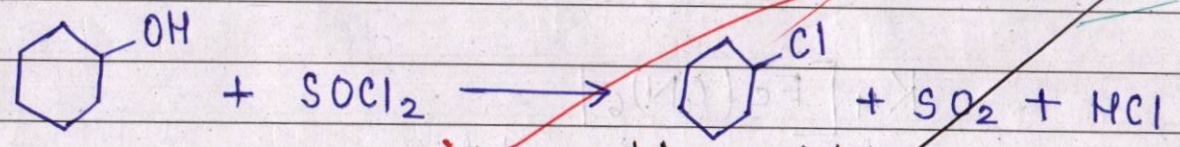
Ques=09

(i)

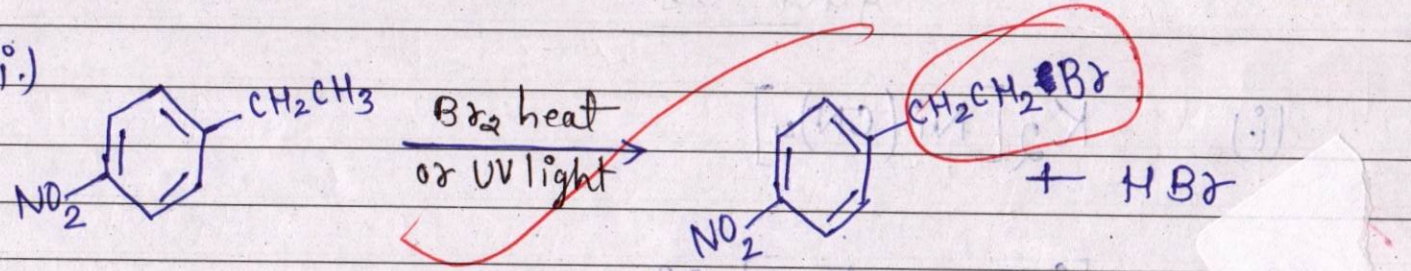


chlorocyclohexane

This is known as Darzen's process, SO_2 and HCl produced in this are escapable and hence pure monohalo product is obtained.

B S E

(ii.)



Monobromo product

Ques = 10

Sources of Vitamin A are, Fish liver oil, carriots, butter and milk.

Any deficiency of these sources can lead to diseases like Night blindness and Xerophthalmia [hardening of eye cornea].

So it is absolutely necessary to supply vitamin-A through these sources.

Ques = 11

Faraday's first law of electrolysis :-
states that the amount of weight deposited at any electrode of electrolytic cell during electrolysis is directly

the quantity of electricity supplied in the electrolytic cell.

$$W \propto Q$$

$$\boxed{W = ZQ}$$

where,

W = weight desposited
Q = quantity of electricity
Z = electrochemical constant.

$$W = Z \times I \times t$$

Electrochemical constant (Z) is defined as equal to amount of weight desposited of electrolyte at any electrode when 1 ampere current is flows for 1 sec.

I = 1 ampere
t = 1 sec

$$\boxed{W = Z}$$

Ques = 12

Complex Reactions are those reactions which gets completed in more than one step.

In these reactions, one step is the slowest and reversible step which is known as the rate determining step.
Through this step only reate of reaction is determined.

Molecularity of reaction cannot be defined for complex reactions, it is only defined for elementary reactions.

These reactions also known as SN_1 reactions in which rate of reaction depends upon the formation of carbocation.

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$$Rate \propto [R-X]$$

Complex reaction:

$$R-X \longrightarrow R^{\oplus} + X^{\ominus} \quad \longrightarrow \text{rate determining step}$$

$$R^{\oplus} + Nu^{\ominus} \longrightarrow R-Nu^{\ominus}$$