o 2009 **माध्यमिक शिक्षा मण्डल, मध्यप्रदेश, भोपाल** मु.उ.पु. 24-पृष्ठ

कार्यालयीन उपयोग के लिए

निम्न रिक्तियों की सही प्रविष्टि परीक्षार्थी द्वारा की जाए।

1. विषय कोड 2 2 0 परीक्षा का विषय chemistry

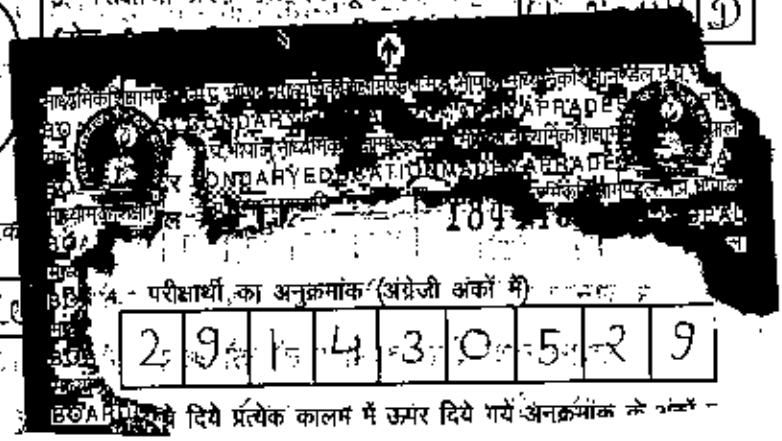
परीक्षा के नाम की सील: हायर सेकेण्डरी+2 परीक्षा

2. परीक्षा का माध्यम English परीक्षा की दिनांक 06/03/09

3. परीक्षार्थी प्रश्न पत्र का पूर्ण कोड नम्बर — कोड — सेट ①

केन्द्र क्रमांक की सील

C. No. 148011



4. परीक्षार्थी का अनुक्रमांक (अंग्रेजी अंकों में)

2	9	1	4	3	0	5	2	9

BOARD — नीचे दिये प्रत्येक कालम में ऊपर दिये गये अनुक्रमांक के अंक —

पर्यवेक्षक/केन्द्राध्यक्ष का प्रमाणीकरण

प्रमाणित किया जाता है कि परीक्षार्थी द्वारा निम्नानुसार पूरक उत्तरपुस्तिका ली गई है :—

क :— संख्या शब्दों में [illegible] अंकों में [illegible]

ख :— परीक्षार्थी की बैठक व्यवस्था कक्ष क्रमांक 44 में है।

ग :— उत्तर पुस्तिका पर प्रश्न-पत्र का कोड नम्बर एवं सेट सही लिखा है।

हस्ताक्षर (पर्यवेक्षक) [signature]

नाम [illegible] पद [illegible]

पता/संस्था [illegible]

परीक्षार्थी द्वारा ली गई सभी पूरक उत्तर पुस्तिकायें, मुख्य उत्तर पुस्तिका के साथ संलग्न हैं।

हस्ताक्षर केन्द्राध्यक्ष

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परीक्षार्थी, परीक्षक से अपेक्षा है कि वे पृष्ठ भाग पर दिये गये निर्देशों का यथेष्ट पालन सुनिश्चित करेंगे।

प्रमाणित किया जाता है कि उपरोक्तानुसार संलग्न पूरक उत्तर पुस्तिका वस्था स्थिति में यथावत् रखते हुए ही उत्तरपुस्तिका का मूल्यांकन किया गया है। मैंने सभी प्रश्नों के उत्तरों का गहन मूल्यांकन किया है। उत्तर पुस्तिका के अन्दर के अंक एवं कव्हर पृष्ठ पर दर्शाये अंक एक समान है एवं योग पूर्णतः सही है।

हस्ताक्षर (परीक्षक) [signature] 22 हस्ताक्षर (उपमुख्य परीक्षक) हस्ताक्षर (मुख्य परीक्षक)

परीक्षक क्रमांक 03290 दिनांक..... दिनांक.....

परीक्षार्थी के लिए निर्देश

1. परीक्षार्थी को अपना अनुक्रमांक/विषय/माध्यम/दिनांक एवं प्रश्न–पत्र का कोड (समूह) मुख पृष्ठ पर अंकित करना अनिवार्य है। अन्यत्र कहीं भी नहीं लिखा जाएगा।
2. अनुक्रमांक नीचे दिये गए उदाहरण अनुसार लिखा जाए :–

1	8	2	4	3	9	5	6	8
एक	आठ	दो	चार	तीन	नौ	पाँच	छः	आठ

3. उत्तर पुस्तिका के दोनों ओर पृष्ठों में लिखें। बीच में रिक्त स्थान न छोडें। भूल से छूटा/रिक्त स्थान तथा शेष खाली पृष्ठों को क्रास किया जाए।
4. परीक्षार्थी प्रश्न पत्र हल करते समय ही, कव्हर पृष्ठ पर दी गई तालिका में प्रश्न क्रमांक के सम्मुख वाले कालम में उत्तरपुस्तिका का वह पृष्ठ क्रमांक अनिवार्य रूप से अंकित करें जिस पर प्रश्न का उत्तर लिखा गया है। यदि पूरक उत्तरपुस्तिका का उपयोग किया गया हो, तो उस पर 25 से प्रारंभ करते हुए पृष्ठ क्रमांक परीक्षार्थी द्वारा स्वयं डाले जाएँ।

परीक्षक के लिए निर्देश

1. केवल उन्हीं उत्तरपुस्तिकाओं का मूल्यांकन करें जिन पर होलो क्राफ्ट स्टीकर चस्पा है।
2. उत्तरपुस्तिका का मूल्यांकन होलो क्राफ्ट स्टीकर को चस्पा स्थिति में यथावत् रखते हुए ही किया जाये।
3. बिना होलो क्राफ्ट स्टीकर वाली तथा फटे हुए होलो क्राफ्ट स्टीकर वाली सभी उत्तरपुस्तिकाऐं मूल्यांकन हेतु परीक्षा नियंत्रक, माध्यमिक शिक्षा मण्डल, मध्यप्रदेश, भोपाल को व्यक्तिशः रूप से भेजी जाये।

मूल्यांकन केन्द्र के लिए निर्देश

1. **O.M.R. SHEET** पर प्राप्तांक की प्रविष्टि करने हेतु केवल वही उत्तरपुस्तिकाएँ प्राप्त करें, जिनका मूल्यांकन होलो क्राफ्ट स्टीकर को चस्पा स्थिति में यथावत् रखते हुए ही किया गया है। यदि होलो क्राफ्ट स्टीकर फटा हुआ पाया जाता है तो ऐसी उत्तरपुस्तिकाऐं मूल्यांकन केन्द्र अधिकारी को पृथक से सौपी जाएँ। ऐसे प्रकरणों के प्राप्तांकों की प्रविष्टि **O.M.R. SHEET** में नहीं की जाए। मूल्यांकन केन्द्र अधिकारी ऐसी उत्तरपुस्तिकाऐं पुनः मूल्यांकन के लिये परीक्षा नियंत्रक, माध्यमिक शिक्षा मण्डल, मध्यप्रदेश, भोपाल को व्यक्तिशः रूप से सौपेंगे।
2. उत्तरपुस्तिका के मुख्य पृष्ठ में अंकों एवं शब्दों में अंकित प्राप्तांकों को मिलान कर **O.M.R. SHEET** में अंकों की सटीक प्रविष्टि करें।
3. **O.M.R. SHEET** पर प्रमाणीकरण कर हस्ताक्षर करें।

Ans. (17) The five differences between Lanthanides and Actinides are -

Lanthanides	Actinides
(1) Their general electronic configuration is $4f^{1-14} 5d^{0-1} 6s^2$.	(1) Their general electroni configuration is $5f^{1-14} 6d^{0-1} 7s^2$.
(2) They represent +3 oxidation state mainly but can show +2 and +4 in some metals.	(2) They represent variable oxidation state i.e. they can show +3, +4, +5 etc oxidation states.
(3) They do not form oxo ions.	(3) They form oxo ions like UO_2 etc.
(4) ~~Exp~~ Except Pm, all the lanthenides are non-radio active.	(4) All the actinides are radio-active
5) Lanthanide contrac-tion is more significant.	(5) Actinide contraction is less significant.

Ans. (15) Berkeley and Hartley's method -

In this method, there is a container ~~on~~ which, is coated with a layer of copper ferrocyanide. This layer acts as semi-permeable membrane. This container is connected to a capillary tube on one side and with a water reservoir on the other side.

This container is kept in another big steel container. Now, solution whose osmotic pressure is to be measured in filled in this big container and solvent is filled in small container having the coating of copper ferrocyanide. Pressure guage is connected to bigger container. Now, due to osmosis, water molecules move to the solution side. Hence, water level in the capillary tube decreases. Now, to stop the osmosis, i.e. to make the level of water in the capillary tube same as in the initial position,

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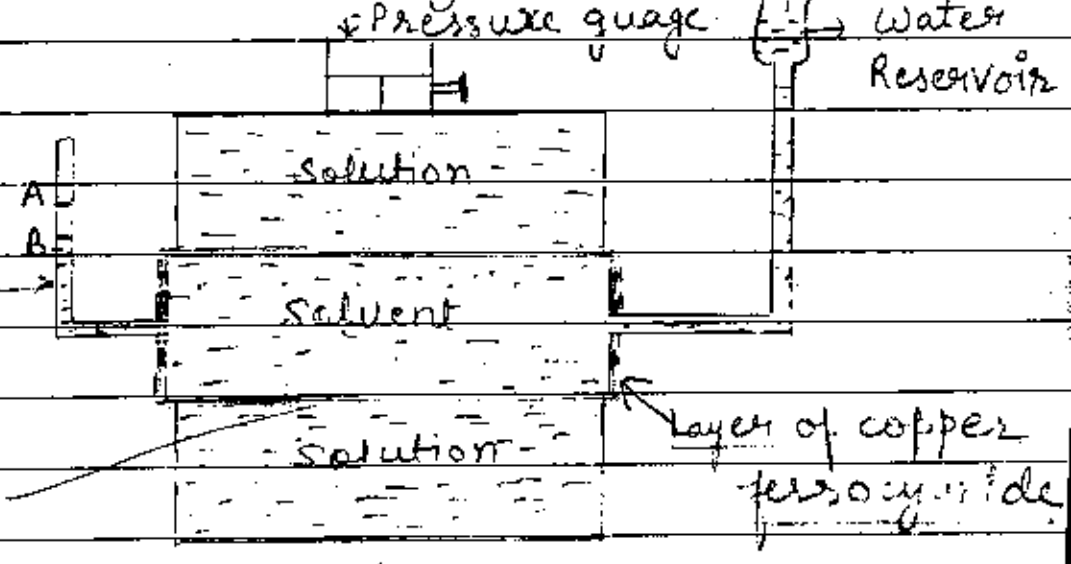
external pressure is applied. This pressure is equal to the osmotic pressure.

Advantages of Berkeley & Hartely's Method -

(1) As pressure is not applied directly on the semi-permeable membrane, hence it remains safe.

(2) This is the most advantageous method as it takes very less time & is also very cheap.

(3) The osmotic pressure measured by this method is very accurate.



Berkeley and Hartely's method to determine osmotic pressure

Ans. (14) Artificial Sweeteners –

The substances which are used in place of sugar (or sucrose) are called as artificial sweeteners. These sweeteners are many times sweet than sugar but they have no calorific value. They are useful for patients suffering from diabetes or those who are fat, because they do not produce calories or ~~carbohyde~~ fats.

The name of 4 artificial sweeteners are –

(1) Saccharin or sweetex.

(2) Aspartame or sugar free.

(3) Monelline.

(4) Sorbitol

Ans. (13) ~~Chemi~~

Vitamin	Chemical Name	Deficiency Disease
Vitamin A	Retinol	Night Blindness
Vitamin B (Vitamin B_1)	Thiamine	Beri-Beri
Vitamin C	~~Ascor~~ Acsorbic Acid	Scurvy, spongy & bleeding gums
Vitamin D	Calcifiers	Rickets

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Ans. (12) (a) Cannizzaro Reaction –

When two molecules of ~~Those~~ aldehydes which do not contain α-hydrogen like formaldehyde and benzaldehyde ~~when~~ react in the presence of ~~their sodium salt~~ + NaOH, then one molecule is oxidised to alcohol and another molecule is reduced to form sodium salt of carboxylic acid. This reaction is known as cannizzaro Reaction.

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for e.g. -

(1)

$$HCHO + HCHO \xrightarrow{NaOH} CH_3-OH + HCOONa$$

Formaldehyde → Methyl Alcohol; Sodium formate

(2)

$$C_6H_5CHO + C_6H_5CHO \xrightarrow{NaOH} C_6H_5-CH_2-OH + C_6H_5COONa$$

Benzaldehyde → Benzyl Alcohol; Sodium benzoate

(b) Benzoin condensation -

When two molecules of benzaldehyde condense together to form benzoin, then this condensation is called as benzoin condensation.

$$C_6H_5-\underset{\underset{O}{\|}}{\overset{H}{\overset{|}{C}}} + \underset{H}{\overset{|}{C}}-\underset{O}{\overset{\|}{C}}-C_6H_5 \longrightarrow C_6H_5-\underset{OH}{\overset{|}{CH}}-\underset{O}{\overset{\|}{C}}-C_6H_5$$

Benzaldehyde → Benzoin

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Ans.(5) Differences between Molecularity and Order of Reaction are –

Order of Reaction	Molecularity
(1) It is the sum of powers raised ~~to~~ on the concentration term in the actual rate law expression of a chemical reaction.	(1) It is the total no. of ~~ions~~ atoms or molecules participating in the ~~act~~ rate determining step of a chemical reaction.
(2) Order of reaction can be zero order.	(2) Molecularity can never be zero order.
(3) It may be fractional.	(3) It may never be fractional.
(4) It is based on actual rate law.	(4) It is based on theoretical rate law or law of mass action.

Ans. (6)

Ores of copper -

(Name)	Formula
(1) Copper Pyrite	$CuFeS_2$
(2) Malachite	$CuCO_3 . Cu(OH)_2$
(3) Azurite	$2CuCO_3 . Cu(OH)_2$

Ores of Iron

Name	Formula
(1) Iron Pyrite	FeS_2
(2) Haemetite	Fe_2O_3
(3) Magnetite	Fe_3O_4

Ans. (9) The following are the main postulates of Werner's co-ordination theory -

(1) Each metal atom has two types of valencies -

(i) Primary valencies - These are non-ionisable valencies and are represented by dotted line (----).

(ii) Secondary valencies - These are ionisable valencies and are represented by solid line (——).

(2) Each metal atom has the tendency to satisfy its primary as well as secondary valencies.

(3) Primary valencies are satisfied by negative ions.

(4) Secondary valencies are satisfied by positive, negative or neutral ions. It means negative ions can satisfy both types of valencies.

(5) The no. of secondary valencies or ionisable valencies or co-ordination number in an ~~compoun~~ atom is definite.

The valencies have a definite orientation in space around a central metal atom.

Ans. (10) (i) Iodoform Reaction -

When acetone reacts with iodine and NaOH or Na_2CO_3, then iodoform is formed. This reaction is called as iodoform reaction. (Formation of yellow crystals of iodoform) This reaction is used as a test for some compounds wherein one gives the test & other does not. Like -

(1) Ethanal gives and methanal does not etc.

$$CH_3-\overset{O}{\overset{\|}{C}}-CH_3 + 3I_2 \longrightarrow CI_3-\overset{O}{\overset{\|}{C}}-CH_3 + 3HI$$

$$CI_3COCH_3 + NaOH \longrightarrow CHI_3 + CH_3COONa$$

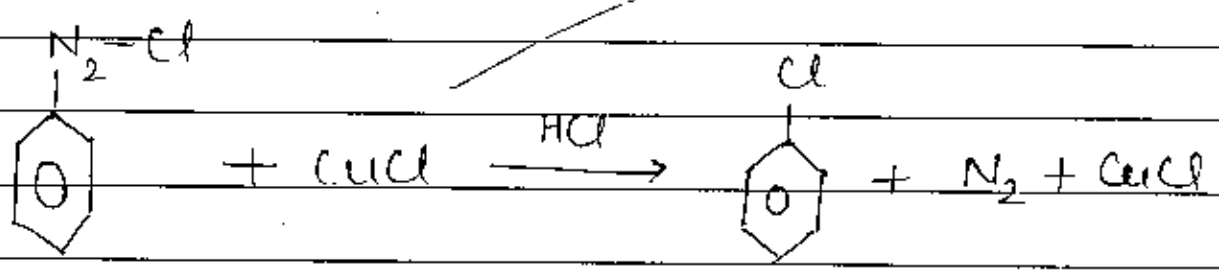
$$3HI + 3NaOH \longrightarrow 3NaI + 3H_2O$$

$$CH_3COCH_3 + 3I_2 + 4NaOH \longrightarrow CHI_3 + CH_3COONa + 3NaI + 3H_2O$$

Acetone — Iodoform

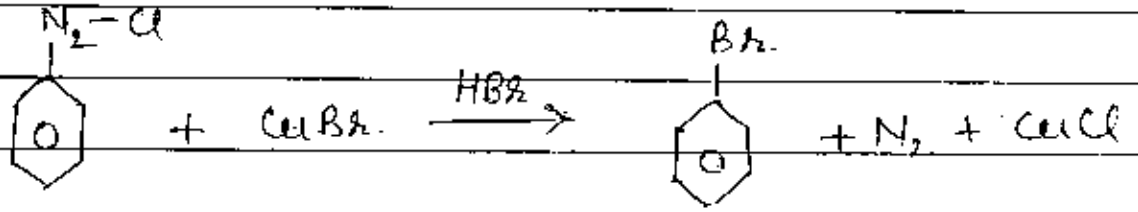
(ii) Sandmeyer Reaction -

When a diazo salt like benzene diazonium chloride is reacted with cuprous bromide or chloride iodide in presence of same halogen acid, then chloro or bromo benzene is formed. This reaction is called as Sandmeyer Reaction.



Benzene diazonium chloride

Chloro benzene



Benzene Diazonium chloride

Bromo benzene

Ans. (11) The differences between Alcohols and Phenols are -

Alcohols	Phenols
(1) It is ~~sparingly~~ fairly soluble in water.	(1) It is ~~fairly~~ sparingly soluble in water.
(2) They have narcotic action.	(2) They are toxic to all living tissues.
(3) They gives esters with carboxylic acid.	(3) Do not give esters with carboxylic acid.
(4) on oxidation, they gives aldehydes and ketones.	(4) on oxidation, it gives coloured compound quinone.
(5) Do not give electro-philic substitution reaction.	(5) They give electro-philic substitution reactions.

Ans. (8) The elements of 17th group are flourin fluorine, chlorine, bromine, iodine and astatine. They all are called as halogens.

The word meaning of "halogens" is sea salt producers. Since, the salts of elements of 17th group are found in sea, hence, they are called as halogens.

Trend of Properties -

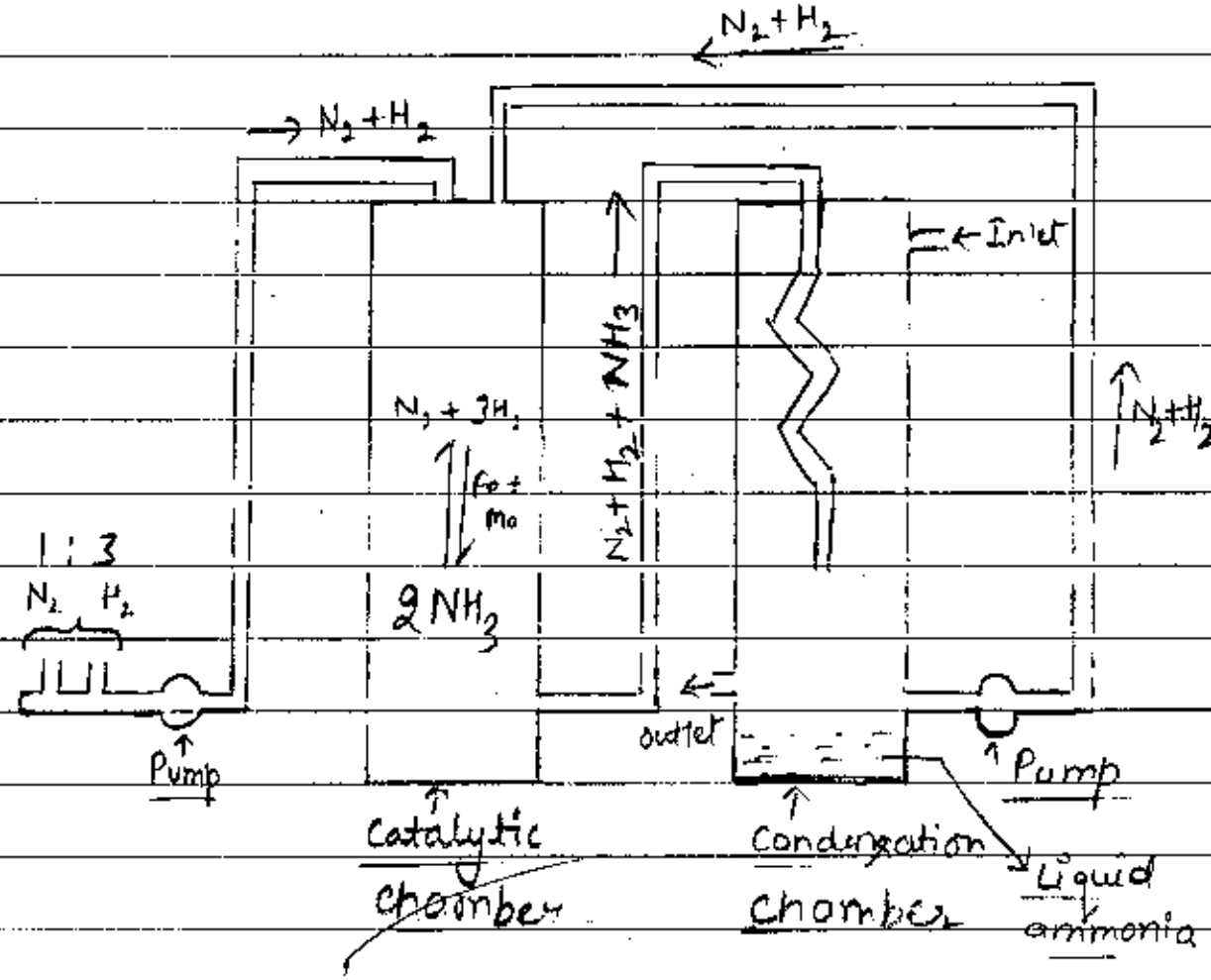
(1) Oxidation State - The oxidation state of halogens is -1 mainly, since they have 1 electron less from the octet. Except fluorine all other elements of 17th group can show positive oxidation state i.e. +1, +3, +5 and +7 because they have empty d-orbitals. Positive oxidation state is shown when they combine with less electronegative element. But flourine can show -1 oxidation state only because, it is the highest electronegative element and it has no empty d-orbitals.

(2) Electronegativity - The electronegativity of halogen elements are highest in their respective period due to ~~to small size and~~ increased nuclear charge.

On moving down the group, the electronegativity decreases because of ~~sm~~ increased size.

(3) Oxidising Property - The oxidising nature of ~~flouri~~ ~~fluori~~ of halogen elements is highest in their respective period. Hence, fluorine is the ~~highest~~ ~~ext~~ strongest oxidising agent and this property decreases down the group due to decreased electronegativity.

Ans. (7)



Haber's Process for manufacture of Ammonia

In this method, nitrogen and hydrogen in the ratio 1:3 are reacted with each other in the presence of Fe (iron) catalyst and Mo ~~catyli~~ catalytic promoter at low temperature about 450–500°c and high pressure about 200 atm to produce ammonia. This process is called as Haber's process

for manufacture of ammonia. The reaction involved in this process is -

1 $N_2 + 3H_2 \underset{450\text{-}500^\circ C,\ 200\ atm}{\overset{Fe + Mo}{\rightleftharpoons}} 2NH_3$

Nitrogen (1 part) Hydrogen (3 parts) Ammonia

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Q1 (I) — Objective Type -

Ans. (a) ii) Schottkey Defect

Ans. (b) (i) Benzene - Chloroform

Ans. (c) (iv) Homogeneous Catalyst

Ans. (d) (i) CH_3COOH

Ans. (e) i) Diabetes

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Q.(2) Fill in the blanks –

Ans.(c) Radius ratio

Ans. (b) exothermic

Ans. (c) Copper

Ans. (d) lone pair of electrons

Ans. (e) Sushrut

Q. (3) Match –

~~Ans. (a) Glass — (ii) Λ~~

Ans. (a) Glass – (ii) Amorphous solid

Ans. (b) Arrhenius equation (i) $K = Ae^{-E_a/KT}$

The correct Arrhenius equation is $K = Ae^{-Ea/RT}$. But the equation given is $K = Ae^{-Ea/Kt}$.

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Ans. (c) Reaction of nitrous acid with aliphatic primar amine in cold — (iv) An alcohol

Ans. (d) Diastase — (v) Conversion of starch into sugar

Ans. (e) Standard hydrogen electrode potential — (iii) Zero volt

Q. (4) Answer in one word –

Ans. (i) $n\lambda = 2\sin\theta$

Ans. (ii) In Rosenmund's Reduction, sulphur or quinoline is used to stop further reduction of aldehyde or ketone to acid.

Ans. (iii) Nessler's Reagent.

Ans. (iv) NH_4Cl

Ans. (v) Radon

Ans (16) (i) Specific Conductivity - The reciprocal of specific resistance or specific resistivity is called as specific conductivity.

It is denoted by K.

$$K = \frac{1}{\rho} \quad \text{or} \quad K = \frac{1}{P}$$

where ρ or P = specific resistivity

$\because$ Specific resistivity $\rho = \frac{R.a}{l}$

Hence,

Specific Conductivity, $K = \frac{1}{\frac{R.a}{l}}$

or $$K = \frac{l}{R.a}$$

where, R = Resistance, l = length of conductor

a = Area of conductor

Unit - The unit of specific conductivity is -

$$K = \frac{1}{\rho} = \frac{1}{\text{ohm.cm}}$$

$$K = \text{Ohm}^{-1}.\text{cm}^{-1}$$

(ii) Molar conductivity -

When 1 mole of electrolyte is dissolved in V cm^3 of solution, then the conductivity of total ions produced is called as molar conductivity. It is denoted by Λ_m

It can also be defined as the product of specific conductance and the volume of solution.

i.e. $\boxed{\Lambda_m = K \times V}$

~~Volume of V cm^3 M moles in cm^3 = 1000 ml~~

$\because$ M moles are dissolved in = 1000 cm^3

$\therefore$ 1 mol is dissolved in = $\frac{1000}{M}$ cm^3

Hence, $V = \frac{1000}{M}$ cm^3

Now, $\Lambda_m = K \times \frac{1000}{M}$

or $\boxed{\Lambda_m = \frac{K \times 1000}{M}}$

Unit - The unit of molar conductivity is -

$$\Lambda_m = \frac{Ohm^{-1} cm^{-1} \times cm^3}{mol}$$

$$\therefore \Lambda_m = Ohm^{-1} cm^2 mol^{-1}$$

Ans (12) Principle -

When ~~acetone~~ calcium acetate is heated to a high temperature, then acetone is formed.

$$\underset{\text{calcium acetate}}{CH_3COO)Ca} \xrightarrow{\Delta} \underset{\text{Acetone}}{CH_3COCH_3} + \underset{\text{calcium carbonate}}{CaCO_3}$$

Method - About 30-40 gram calcium acetate is taken in a retort and heated with the help of ~~wire~~ burner by placing the retort over wire guage. Acetone formed is passed through

पूरक उ.पु. 4 पृष्ठ

माध्यमिक शिक्षा मण्डल, मध्यप्रदेश, भोपाल

1. केन्द्र की सील
2. पर्यवेक्षक के हस्ताक्षर व दिनांक
3. केन्द्राध्यक्ष के हस्ताक्षर की सील
4. केन्द्र क्रमांक C. No. 148011
6. परीक्षा का नाम Higher Secondary Exam.
7. विषय Chemistry 8. माध्यम English
8. दिनांक 06/03/09

परीक्षक के लिये
के निशान से मिलाकर लगायें

पृष्ठ (25)

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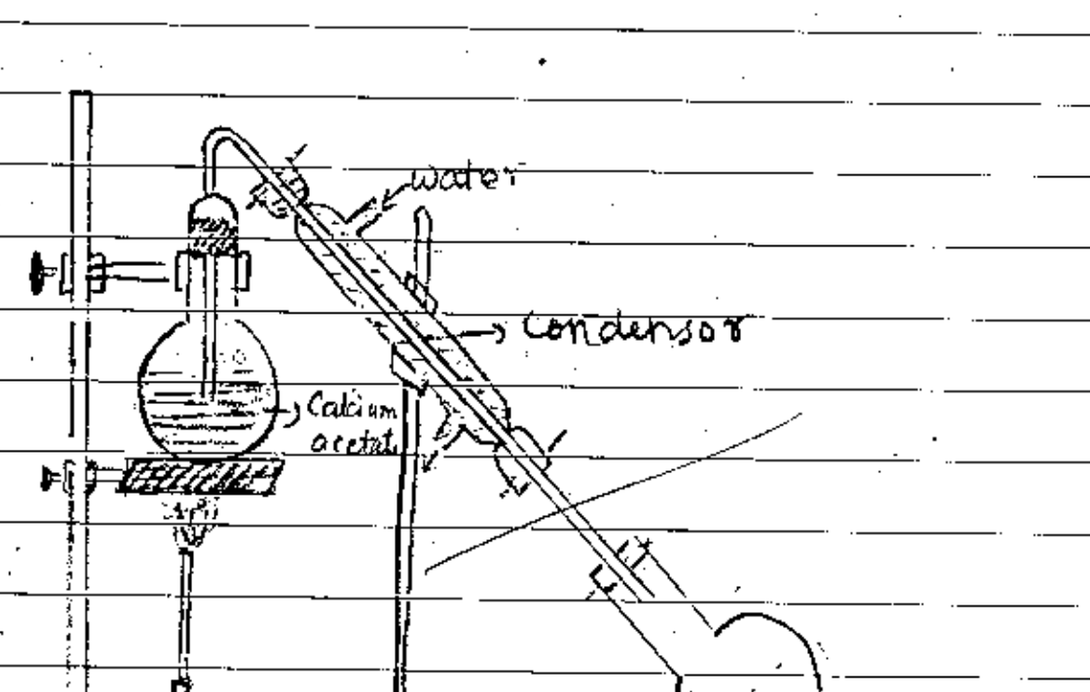
condensor, Hence, it is formed.



दूसरे के अंकों का योग

Laboratory Preparation of Acetone

Acetone formed is impure Hence, it is purified by sodium ~~bicarbo~~ bisulphate and then the product formed is reacted with

sodium carbonate. Then pure acetone distills over.

$$2\left[CH_3-\overset{O}{\overset{\|}{C}}-CH_3\right] + 2NaHSO_3 \rightarrow 2\left[\begin{matrix}CH_3 \\ CH_3\end{matrix}\!\!>\!C\!<\!\begin{matrix}OH \\ SO_3Na\end{matrix}\right]$$

Acetone — sodium bisulphate — Acetone sodium bisulphate

$$2\left[\begin{matrix}CH_3 \\ CH_3\end{matrix}\!\!>\!C\!<\!\begin{matrix}OH \\ SO_3Na\end{matrix}\right] + Na_2CO_3 \rightarrow 2\left[CH_3-\overset{O}{\overset{\|}{C}}-CH_3\right] + \text{Side Products}$$

Sodium carbonate — Acetone

~~$+2Na_2SO_3 + 2H_2CO_3$~~

Hence, this acetone formed is pure.

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③ [ ] + [ ] = [ ]

योग पूर्व पृष्ठ | पृष्ठ 3 के अंक | कुल अंक

2-7

के अंकों का योग

योग पूर्व पृष्ठ + पृष्ठ 4 के अंक = कुल अंक

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पृष्ठ के अंको का योग