छत्तीसगढ़ माध्यमिक शिक्षा मण्डल, रायपुर

jlk;u

d{kk XII

lEiy i'u&i=

¼fo|kfpr bdkb½

NÙkhlx< ek/;fed f'k{kk e.My] jk;ij

i'u & i= dh ;ktuk

Scheme of Question Paper

fo"k;%& jlk;u

i.kkd % 75

le; % 3 ?kV

ijh{kk % gk;j ld.Mjh

¼v½ 'k{kf.kd mnn';ksa dk vuqikr eku

(A) Weightage as per Educational objective:

lq Ø0	mnn';		vad	izfr'kr
1-	Kku (Knowledge)		23	30-7%
2-	vocks/k (Understanding)		37	49-3%
3-	vuqiz;ksx ,oa dk'ky (Application & Skill)		15	20-0%
		;ksx	75	100%

¼c½ bdkbokj vadksa dk eku

lq Ø0	bdkbo dk uke	bdkbo ij vkcfVr vad	i'u&i= dk izk:i vuqikr vkcfVr vad
1-	ijek.kq lajpuk ,oa jlk;u vkc/kksa	4	4
2-	inkFkksZ dh voLFkk,&Bksl voLFkk	4	4
3-	foy;u	4	4
4-	vk;fud lkE;	4	4
5-	jklk;fud m"ekxfrdh	4	4
6-	jMkDl vfHkfØ;k,a o fo-jk- ly	5	5
7-	jklk;fud cyxfrdh	5	5
8-	ukfHkdh; jlk;u	5	5
9-	lrg jlk;u	4	4
10 (a)	P&Cykd d leg 15 o 16	6 *	6 * ┐ 10
10 (b)	P&Cykd d leg 17 o 18	4 *	4 * ┘
11-	lØe.k ,oa vr% lØe.k rRo	5	5
12-	milgl;kfk ;kfxd	4	4
13-	vkDlhtu ;Dr fØ;k leg	8	8
14-	ukbVkstu ;Dr fØ;k leg	5	5
15-	nfud thou e jlk;u	4	4

¼l½ dfBukbZ Lrj (Difficulty Level)

lO ØO	mnn';	vad	ifr'kr
1-	ljy (Easy)	15	20%
2-	vkSlr (Average)	45	60%
3-	dfBu (Difficult)	15	20%
	;kx	75	100%

¼n½ i'ui= fn'kk fun'k ,oa fodYi ;kstuk %&

(Instruction's & Scheme of Option for Question Paper)

- oLrfu"B i'u e ¼05½ cgfodYih; i'u rFkk ¼05½ fjDr LFkku dh ifr@mfpr tkMh cuk, dk i'u fn;k tkoxk vkj ;g iR;d lV e i'u Øekd 1 gkxk A
- iR;d lV e 1] 2 ,oa 3 vadk d i'uk e fHkUurk jgxh A leLr 04 vad ;k bll vf/kd vdk d y?kmÙkjh; rFkk nh?kmÙkjh; i'uk e fodYi fn;k tkuk g A fodYi i'u mlh bdkbZ l rFkk leku mnn';k d jgx A 04 vad ;k bll vf/kd vdk d i'u iR;d lV e ,d leku jgx A
- vf/kdre mÙkj lhek vfry?kmÙkjh; ½2 vad@30 'kCn½ ¼3 vad@50 'kCn½
  y?kmÙkjh; ¼4 vad@75 'kCn½ ¼5 vad@150 'kCn½
  nh?kmÙkjh; ¼6 vad ;k vf/kd@250 'kCn½

fodYi ;kstuk

- y?k mRrjh; i'u &
  4 vad oky dy 4 i'u ¼i-Ø- 11] 12] 13 o 14½
  5 vad oky dy 3 i'u ¼i-Ø- 15] 16 o 17½
- nh?k mRrjh; i'u &
  6 vad oky dy 2 i'u ¼i-Ø- 18 o 19½

dy 9 i'u

i'u & i= dk CyfiUV

Blue Print of Question Paper

fo"k;%& jlk;u

i.kkd % 75

le; % 3 ?kaVs

ijh{kk % gk;j ld.Mjh

bdkbZ l-Ø-	bdkbZ	bdkbZ ij vkcfVr vad	vadkj i'u							dy i'u
			1 vad	2 vad	3 vad	4 vad	5 vad	6 vad	6 vad ;k bl l vf/kd	
1	ijek.k @ vkc/ku	4	1		1					1 + 1
2	Bkl voLFkk	4	1		1					1 + 1
3	foy;u	4				1				1
4	vk;fud lkE;	4	1 1	1						1 + 2
5	jklk- Å"ekxfrdh	4				1				1
6	jMkDl @ ly	5					1			1
7	jklk- cyxfrdh	5					1			1
8	ukfHkdh; jlk;u	5		1	1					2
9	lrg jlk;u	4				1				1
10(a)	P&ox 15@16	6] 10						1		1
10(b)	P&ox 17@18	4]	1 1	1						1 + 2
11	lØe.k rRo	5					1			1
12	mi lgl;kth ;k-	4				1				1
13	vkDlhtu ;Dr fØ;k leg	8	1 1					1		1 + 2
14	ukbVkt u ;Dr fØ;k leg	5		1	1					2
15	nfud thou e jlk;u	4	1 1	1						1 + 2
	;kx	75	10@1	5	4	4	3	2	&	18$1

Set - A

gk;j ld.Mjh Ldy lVhfQdV ijh{kk

Higher Secondary School Certificate Examination

lEiy&i'u i=

SAMPLE PAPER

fo"k; %& (Subject) - jlk;u **le; 3 ?k.Vk (Time- 3 Hrs)**

d{kk %& (Class) - 12oh **i.kZd 75 (M.M.)**

(Instruction) & ¼fun'kZ½

1- lHkh i'u gy djuk vfuok;Z g A

Attempt all the Question

2- i'u Øekd 01 e 10 vad fu/kkfjr g A nk dky[k.M g A [k.M ^^v** e 05 cgfodYih; i'u rFkk [k.M ^^c** e 05 fjDr LFkkuk dh ifr vFkok mfpr lc/k tkfM, A iR;d i'u d fy, 1 vad vkcfVr g A

Q. No. 01 Carries 10 Marks. There are two sub-section, Section A is Multiple choice carries 05 marks and section B is fill in the blanks or match the column carries 05 marks.

3- i'u Øekd 02 l i'u Øekd 06 rd vfr y?kqRrjh; i'u g A iR;d i'u ij 02 vad vkcfVr g A mRrj dh vf/kdre 'kCn lhek 30 'kCn A

Q. No. 2 to 06 are very short answer type question & it carries 02 marks each. Word limit is maximum 30.

4- i'u Øekd 07 l i'u Øekd 10 rd y?kqRrjh; i'u g A iR;d i'u ij 03 vad vkcfVr g A mRrj dh vf/kdre 'kCn lhek 50 'kCn A

Q. No. 07 to 10 are short answer type question & it carries 03 marks each. Word limit is maximum 50.

5- i'u Øekd 11 l i'u Øekd 14 rd y?kqRrjh; i'u g A iR;d i'u e vkrfjd fodYi g vkj iR;d i'u ij 04 vad vkcfVr g A mRrj dh vf/kdre 'kCn lhek 75 'kCn A

Q. No. 11 to 14 are short answer type question & it carries 04 marks each. Each question has internal choice. Word limit is maximum 75.

6- i'u Øekd 18 l i'u Øekd 19 rd nh?kmRrjh; i'u gA iR;d i'u e vkrfjd fodYi gvkj iR;d i'u ij 06 vd vkcfVr gA mRrj dh vf/kdre 'kCn lhek 150 'kCn A

Q. No. 18 to 19 are long answer type question & it carries 05 marks each. Each question has internal choice. Word limit is maximum 150.

lk'Uk 1 ¼v½ Ckgf0kdYlkh¸k lk'Uk

1- v.k@vk¸kUk Tkk sp^3d^3 Lkdj.k n'kkRkk g&

¼v½ XeF_4 ¼c½ SF_6

¼l½ XeF_6 ¼n½ $[Cr(NH_3)_6]^{3+}$

2- fn¸kk LkYkkb dh fMCCkh Ek LkEkfEkfRk gkRkh g&

¼v½ ?kUkh¸k ¼c½ f0k"kEkYkCkk{k

¼l½ f}LkEkYkCkk{k ¼n½ ,dUkRkk{k

3- vk¸kUkUk dh Ekk«kk dk IkHkkf0kRk Ukgh djUk OkkYkk dkjd g&

¼v½ vUkRk RkUkRkk ¼c½ f0kYkk¸kd dh IkÑfRk

¼l½ f0k|Rk vlk?kV¸k dh IkÑfRk ¼n½ RkkIk

4- fUkEUkfYkf[kRk Ek Lk dkUk Lkh xl Okk¸k EkMYk Ek Ukgh Ikkb TkkRkh g&

¼v½ Ne ¼c½ Rn

¼l½ Ar ¼n½ He

5- QkfEkd vEYk&

¼v½ TkYk d LkkFk vfEkJ.kh gA

¼c½ vEkkfUkdYk fLkY0kj UkkbVV dk vlkPk¸kUk djRkk gA

¼l½ ,LkhfVd vEYk Lk RkhUk Xk.kk nCkYk vEYk gA

¼n½ KOH dk XkEk djUk lkj IkkIRkgkRkk gA

Que 1 (A) Multiple Choice question -

1. Molecule/ion which shows sp^3d^3 hybridization -

(a) XeF_4 (b) SF_6

(c) XeF_6 (d) $[Cr(NH_3)_6]^{3+}$

2. Symmetry in Match Box is -

(a) Cubic (b) Orthorhombic

(c) Tetragonal (d) Monoclinic

3. Factor which effect Degree of ionisation is -

(a) infinite dilution (b) Nature of solvent

(c) nature of electrolyte (d) temperature

4. Whcih one of the following gas is not present in atmosphere -

(a) Ne (b) Rn

(c) Ar (d) He

5. Farmic acid is -

(a) non missible with water.

(b) reduces to ammonical silver nitrate solution

(c) thrise weak in comparison of acetic acid

(d) obtain on heating KOH.

¼c½ fjDRk LFkkUkk dh IkfRk dhfTk,

1- NO^+ dk LFkkbR0k NO Lk &&&& gkRkk gA

2- ¶Ykkjhlk XkLk dk &&&&d Ikk«k Ek j[kk TkkRkk gA

3- &&&&&&&&& fUk'PkRkd d :Ik Ek Ik,kDRk gkRkk gA

4- VQYkkUk IkkYkhEkj dk ,dYkd &&&&&&&&&&gA

5- Qfjd DYkkjkbM d TkYkh,k f0kYk,kUk dh IkÑfRk &&&&&&& gkRkh gA

(B) Fill in the blanks -

1. Stability of NO^+ is ..... from NO.

2. Fluorine gas is kept in the ..... vessel.

3. ..... is used as an anaesthetics.

4. The monomer of Teflon polymer is .....

5. The nature of aquous solution of $FeCl_3$ is .....

Ik'Uk 2- pH EkkUk dh IkfjHkk"kk ,0k Lk«k fYkf[k,A

Write the formula and definition of pH value.

Ik'Uk 3- æ0,kEkkUk {kfRk dk IkfjHkkf"kRk dhfTk,A

Define mass defect.

Ik'Uk 4- ¶Ykkjhlk d nk v,kLdk d UkkEk 0k Lk«k fYkf[k,A

Write the name and formulae of two ores of fluorine.

Ik'Uk 5- XkfCkYk FkYkEkkbM vfHkfØ,kk dk fYkf[k,A

Write Gabriel's phathalimide reaction.

Ik'Uk 6- dkb nk IkfRkTkf0kd vk"kf/k;k d UkkEk fYkf[k,A

Write the name of any two antibiotics drugs.

Ik'Uk 7- vkCk/kh vkj IkfRkvkCk/kh vkf.0kd d{kd Ek RkhUk dkb vRkj fYkf[k,A

Write any three differences between bonding and Anti-bonding molecular orbitals.

Ik'Uk 8- LkEkU0k,kd Lk[,kk D,kk g\ v"VQYkdh,k fjfDRk gRk LkEkU0k,kd Lk[,kk dk UkkEk fYkf[k, A

What is coordination number ? Write the name of coordination number for octahedral voids.

Ik'Uk 9- ,fYkQfVd ,EkhUk] ,jkEkfVd ,EkhUk ,0k vEkkfUk,kk d {kkjh,k Xk.kk dh RkYkUkk dhfTk,A

Compare the basic properties of aliphatic amine, aromatic amine and ammonia.

Ik'Uk 10- UkkHkdh,k f0k[kMUk d RkhUk mIk,kkXk fYkf[k,A

Write any three uses of Nuclear fission.

Ik'Uk 11- D0kFkUkkd Ek mUUk,kUk d vk/kkj Ikj v0kk"Ik'khYk f0kYk,k IknkFk dk v.kHkkj KkRk dhfTk,A

Determine the molecular mass of a non volatile solute with the help of elevation of boiling point.

¼vFkok½

fgEkkd Ek v0kUkEkUk d vk/kkj Ikj v0kk"Ik'khYk f0kYk,k IknkFk dk v.kHkkj KkRk dhfTk,A

Determine the moleculr mass of non volatile solute with the help of depression in freezing point.

Ik'Uk 12- fLk) dhfTk, fd $\Delta G = \Delta H - T\Delta S$

Prove that $\Delta G = \Delta H - T\Delta S$

¼vFkok½

fLk) dhfTk, fd $-\Delta G = W_{non-\exp ansion}$

Prove that $-\Delta G = W_{non-\exp ansion}$

Ik'Uk 13- HkkfRkd ,Ok jkLkk;kfUkd vf/k'kk"k.k Ek Pkkj vRkj fYkf[k, \

Write any four differences betwen physical adsorption and chemical adsorption.

¼vFkOkk½

æ0k LUkgh dkYkkbM ,Ok æ0k f0kjk/kh dkYkkbM Ek Pkkj vRkj fYkf[k,\

Write any four differences between Lyophilic and Lyophobic colloids.

Ik'Uk 14- fUkEUk ;kfxdk d vkb-;k-Ikh-,-Lkh- UkkEk fYkf[k,

Write the I.U.P.A.C. name of the following compounds.

¼1½ $K_4[Fe(CN)_6]$

¼2½ $[Co(NH_3)_6]Cl_3$

¼3½ $K_2[HgI_4]$

¼4½ $[Cu(NH_3)_4]SO_4$

¼vFkOkk½

fUkEUkfYkf[kRk d Lkjpkukk Lk«k fYkf[k, &

1- IkkVf'k;kEk Qjh (III) Lkk;kUkkbM

2- IkkVf'k;kEk Mkb Lkk;kUkk vTkUVV (I)

3- VV Lkk;kUkk fUkfdYkV (II) vk;kUk

4- VVk dkCkkfUkYk fUkfdYk (O)A

Write the structural formulae of the following compounts -

1. Pot. ferr. (III) cyanide
2. Pot. Di cyano argentate (I)
3. Tetra Cyano Nickelate (II) ion
4. Tetra carbonyl Nickle (O)

Ik'Uk 15¼1½ UkhPk fn;k Xk, LkYk d E^o Xk.kUkk dhfTk, &

$E^o_{Ag^+/Ag}$ = (+) 0.80V, $E^o_{Cu^{+2}/Cu}$ = +0.34V gA

¼2½ XkY0kUkh LkYk 0k f0k|Rk vIk?kVUkh LkYk Ek dkb nk vRkj fYkf[k,A

(1) Calculate the E^o of the following cell -

$E^{o}_{Ag^{+}/Ag}$ = (+) 0.80V, $E^{o}_{Cu^{+2}/Cu}$ = +0.34V

(2) Write any two differences between Galvanic cell and Electrolytic cell.

¼vFkOkk½

¼1½ LkYk Zn(s) | Zn++ (aq.) || Ag+(aq.) (1.0)M | Ag(s) (1.0M) dk 298K lkj EMF KkRk djk A ($E^{o}_{Ag^{+}/Ag}$ = 0.789V, $E^{o}_{Zn^{2+}/Zn^{-}}$ = –0.76V)

¼2½ lkFkfEkd LkYk ,Ok f}Rkh;kd LkYk Ek nk vRkj fYkf[k, \

(1) Calculate the EMF of the following cell at Zn(s) | Zn++ (aq.) || Ag+(aq.) 10M | Ag(s) (1.0M) [Give that $E^{o}_{Ag^{+}/Ag}$ = 0.789V, $E^{o}_{Zn^{2+}/Zn^{-}}$ = –0.76V]

(2) Write any two differences between primary and secondary cell.

lk'Uk 16- lkFkEk dkfV dh vfHkfØ;kk d fYk, nj fLFkjkd dh Xk.kUkk LkEkkdYkUk f0kf/k Lk dhfTk, A

Calculate the rate constant of first order reaction from integrated method.

¼vFkOkk½

'kU;k dkfV dh vfHkfØ;kk d fYk, nj fLFkjkd dh Xk.kUkk LkEkkdYkUk f0kf/k Lk dhfTk, \

Calcualte the rate constant of zero order reaction from integrated method.

lk'Uk 17- QkVkXkkQh d fUkEUk lknk dk LkEkÖkkb;k&

1- mnHkkLkUk

2- M0kYkflkXk

3- fLFkjhdj.k

4- flkfVXk

5- VkfUkXk ;kk jXk LkLdj.k

Explain photography on following points -

(i) Exposure

(ii) Developing

(iii) Fixation

(iv) Printing

(v) Toning

¼vFkOkk½

dkIkj Ikk,kjkbVhTk Lk RkkCkk d fUk"d"k.k d fUkEUk Iknk dk LkEkÖkkb,k\

1- v,kLd dk Lk«k

2- v,kLd dk Lkkæ.k

3- HkTkUk ,Ok IkXkYkUk Iknk Ek Ik,kDRk jkLkk,kfUkd vfHkfØ,kk

4- EkV d ?kVd

5- 'kk/kUk Ek Ik,kDRk ,d f0kf/k dk UkkEk A

Explain the extraction of copper from copper pyrites in the following points -

(i) Formula of ore

(ii) Concentraction of ore

(iii) main reactions in roasting

(iv) component of matte

(v) name of one method involved in purification method.

Ik'Uk 18- vkLV0kkYM f0kf/k Lk Ukkbfvd vEYk d fUkEkk.k dk fUkEUk f0knvk d vk/kkj Ikj fYkf[k,&

1- fLk)kRk

2- UkkEkkfdRk fPk«k

3- Ik,kDRk jkLkk,kfUkd vfHkfØ,kk,

Explain the manufacture of nitric acid from Ostwald method in the following points -

(i) Principle

(ii) Labelled diagrame

(iii) chemical reaction used in the process.

¼vFkOkk½

LkY¶,kfjd vEYk d fUkEkk.k dh LkIkd f0kf/k dk 0k.kUk fUkEUk f0knvk d vk/kkj Ikj dhfTk, &

1- fLk)kRk

2- UkkEkkfdRk fPk«k

3- Ik¸kDRk jkLkk¸kfUkd vfHkfØ¸kk,A

Explain the manufacture of Sulphuric acid from contact proces in the following points -

(i) Principle

(ii) Labelled diagrame

(iii) Chemical reactions used in the process.

Ik'Uk 19- Ik¸kkXk'kkYkk Ek Mkb,fFkYk bFkj d fUkEkk.k dk fUkEUk fCknvk d vk/kkj Ikj fYkf[k,&

1- jkLkk¸kfUkd LkEkhdj.k

2- UkkEkkfdRk fPk«k

3- f0kf/k dk Lkf{kIRk 0k.kUk

Explain the Lab. method preparation diethyl ether in the following points-

(i) Chemical equation

(ii) Labelled diagrame

(iii) Method in brief.

¼vFkOkk½

Ik¸kkXk'kkYkk Ek ,fLkVfYMgkbM dk fUkEkk.k fUkEUk fCknvk d vURkXkRk dhfTk, &

1- jkLkk¸kfUkd LkEkhdj.k

2- UkkEkkfdRk fPk«k

3- f0kf/k dk Lkf{kIRk 0k.kUk A

Explain the Lab method preparation of CH_3CHO in the following points-

(i) Chemical equation

(ii) Labelled diagrame

(iii) Method in brief.

vkn'k mÙkj LkV&,

mÙkj 1¼v½ 0kLRkfUk"B

1- ¼Lk½

2- ¼Ck½

3 ¼v½

4 ¼Lk½

5 ¼Ck½

¼Ck½ fjDRk LFkkUk Hkjk &

1 T¸kknk

2 RkkCkk

3 DYkkjkQkEk

4 VVk ¶Ykkjk ,fFkfYkUk

5 vEYkh¸k A

mÙkj 2 fdLkh f0kYkUk dk pH EkkUk mLk _.kkREkd ?kkRk d Lk[¸kkREkd EkkUk d Ckjk Ckj gkRkk g A fTkLk 10 lkj YkXkk¸kk TkkUkk Pkkfg, fTkLkLk mLk f0kYk¸kUk dk H^+ vk¸kUk LkkUæ.k n'kk¸kk Tkk Lkd A

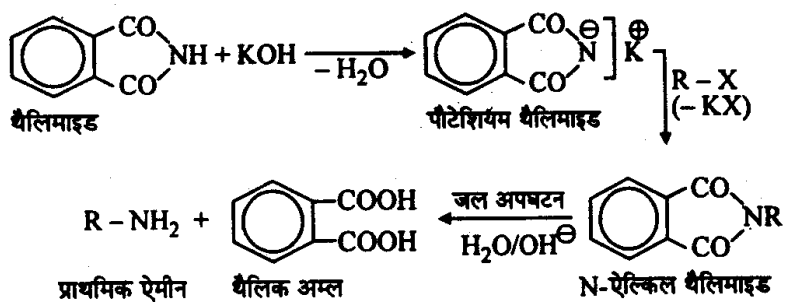
Lk«k $\log [H^+] = -pH \log_{10} 10$;k $pH = \log_{10}[10^+]$

mÙkj 3 tc dkb ijek.k v0k¸k0kh U¸kVkUkk RkFkk lkkVkUkk dh mlk¸kDRk Lk[¸kk Lk CkUkRkk g rk UkkfHkd dk æ0¸kEkkUk Lkn0k ¼Hydrogen dk NkMdj½ U¸kfDYk;kuk d dYk æ0¸kEkkUk Lk dEk gkRkk gA æ0¸kEkkUk Ek ¸kg dEkh æ0¸kEkkUk {kfRk dgYkkRkh gA bLkdk dkj.k vkbUVhUk LkEkh dj.k $E = mc^2$ d vUkLkkj ÅTkk EkDRk gkuk gA

mRrj 4 nk v;Ld 1- ¶ykjLikj CaF_2

2- Øk;kykbV Na_3AlF_6

mRRkj 5



mÙkj 6 nk lkfRkTkf0kd vk"kf/k;k

1- lkfUkfLkfYkUk

2- LVLVkEkkbfLkUk

mÙkj 7-

CkU/kh vk.kf0kd d{kd	lkfRk vkCk/kh vk.kf0kd d{kd
1- bUkdh ÅTkk Lk,kkXk djUk 0kkYk lkjEkk.k d{kdk Lk dEk gkRkh g	1- bUkdh ÅTkk Lk,kkXk djUk 0kkYk lkjEkk.k d{kdk Lk vf/kd gkRkh g
2- Ck/kh vk.kf0kd d{kdk d dkj.k v.k gEk'kk LFkkf,kR0k lkkIRk djRkk g	2- f0klkfjRk Ck/kh vk.kf0kd d{kd v.k Ek gEk'kk vLFkkf,kR0k YkkRk g
3- bLkEk UkkMYk RkYk Ukgh gkRkk	3- bLkEk UkkMYk RkR0k gkRkk gA

mRRkj 8- f«kT,kk vUklkkRk fdLkh fØLVYk Ek mlkfLFkRk /kUk vk,kUk RkFkk _.k vk,kUk fd f«kT,kkvk dk vUklkkRk gkRkk g A

$$\text{f«kT,kk vUklkkRk} = \frac{\text{/kUkkREkd f«kT,kk } r^{+}}{\text{\_.kk,kUk f«kT,kk } r^{-}}$$

fØLVy Ek f«kT,kk vUklkkRk mLkd /kUk vk,kUk dh dkvkMhUk'kUk Lk[,kk dk fUk/kkfjRk djRkk gA

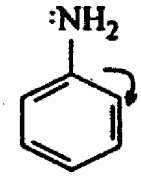
v"VQYkdh,k fjfDRk,kk & ,d f} f«kdk.kh,k fjDRk Tkk N% XkkYkk }kjk f?kjh jgRkh gA v"VQYkdh,k fjDRk dgYkkRkh gA

LkLkdfYkRk 0,k0kLFkkk Ek v"VQYkdh,k fjfDRk,kk dk Lk[,kk d Ckjk Cj gkRkh gA vRk% lkR,kd XkkYk d LkkFk ,d v"VQYkdh,k QYkdh,k fjDRk gkXkh v"VQYkdh,k fjDRk dh f«kT,kk dk vkdkj XkkYk d f«kT,kk d vkdkj dk 0-414 Xk.kk gkRkk gA

$$\frac{r\ void}{r\ sphere} = 0\text{-}414$$

mÙkj 9- ,fYkfQfVd ,ehUk] ,jkEkhVd ,EkhUk vkj vEkkfUk,kk d {kkjh,k Xk.kk dh RkYkUkk

{kkjh,k Xk.k

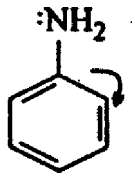
,fYkQfVd ,ehu	,jkEkhVd ,EkhUk	vEkkfUk,kk
1- $CH_3 - \ddot{N}H_2$		$\ddot{N}H_3$

2- +I Effect CH_3 byDVku fuekph leg gku d dkj.k vf/kd {kkjh; gkxk

EkLkkEkfjd lkHkkOk d dkj.k $\ddot{N}H_2$ d UkkbVkTkUk d bYkDVkUk ;Xe CkTkhUk fCkdj Ek f0kLFkkuhRkÑRk gku d d dkj.k {kkjh;rk de gkrh gA

bLkdk {kkjh,k Xk.k UkkbVkTkUk ij byDVku ?kuRo ij fuHkj djrk gA

3- {kkjh,k dk ?kVRkk gvk ØEk

$CH_3 - \ddot{N}H_2 > \ddot{N}H_3 >$ 

,fYkQfVd ,EkhUk vEkkfUk,kk ,YkhfUkYk A

mÙkj 10

1- UkkHkdh,k fj,kDVj Ek f0k[kMUk RkkIk@ÅTkk mRIkUUk djUk e

2- UkkfHkdh,k f0k[kMUk Lk J[kYkk vfHkfØ,kk PkYkdj ÅTkk mRIkknd gkRkk gA

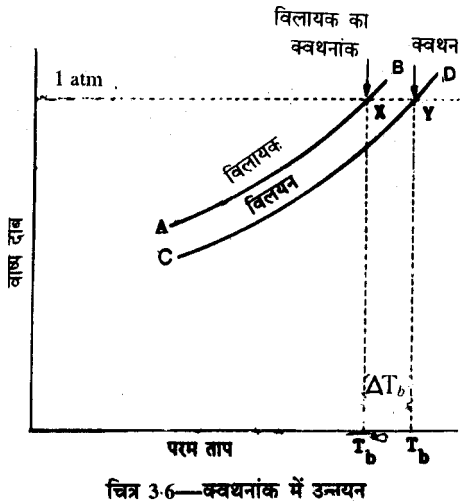
3- UkfHkdh,k f0k[kMUk Lk IkkIRk ÅTkk dk mIk,kkXk b/kUk ,d f0k|Rk ÅTkk mRIkUUk dju eA

mRRkj 11 DoFkukd e mUu;u d vk/kkj ij v.kHkkj dh x.kuk%&

jkmYV d fu;ekulkj&

tc fdlh ok"i'khy 'k) foyk;d e vok"i'khy foy; feyk;k tkrk g rk foy;u d DoFkukd e of) gku yxrh g tk fd foy; d ekyiHkkt d lekuikrh gkrk gA

¼1½



चित्र 3.6—क्वथनांक में उन्नयन

jkÅYV fu;eku lkj

$$Tb - T^{o}b = \Delta Tb$$

$$\Delta Tb \propto m \qquad \text{.....(i)}$$

$$\Delta Tb = k_b m \qquad \text{.....(ii)}$$

$$\because m = \frac{W_B}{M_B} \times \frac{1000}{W_A} \qquad \text{.....(iii)}$$

lehdj.k (ii) e *m* dk eku j[ku ij

$$\therefore \qquad \Delta Tb = K_b \times \frac{W_B}{M_B} \times \frac{1000}{W_A}$$

;k $$M_B = \frac{K_b \times W_B 1000}{\Delta Tb \times W_A}$$

tgk M_B = foy; dk v.kHkkj

K_b = ekyy DoFkukd mUu;u fLFkjkd

ΔTb = DoFkukd e mUU;u

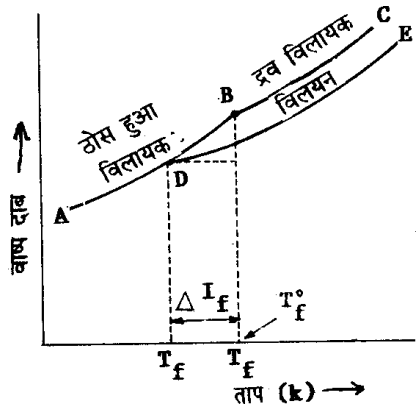
W_A = foyk;d dk Hkkj

W_B = foy; dk Hkkj

¼vFkok½

fgekd d voueu d vk/kkj ij v.kHkkj dh x.kuk&

jkÅYV d fu;eku lkj ^^tc fdlh ok"i'khy 'k) foyk;d e vok"i'khy foy; feyk;k tkrk g rk foy;u d ok"inkc e deh gk tkrh g tk fd mld fgekd e voueu d lekuikrh gkrh gA**



jkÅYV fu;eku lkj

$$Tf - T^{o} f = \Delta Tf$$

$$\Delta Tf \propto X_B \qquad \text{.....(i)}$$

$$\Delta Tf = kX_B \qquad \text{.....(ii)}$$

$$\because X_B = \frac{W_B}{M_B} \times \frac{M_A}{W_A}$$

lehdj.k (ii) e X_B dk eku j[ku ij

$$\Delta Tf = K \times \frac{W_B}{M_B} \times \frac{M_A}{W_A} \qquad \text{.....(iii)}$$

nkuk vkj 1000 dk x.kk dju ij

$$\Delta Tf = \frac{KM_A}{1000} \times \frac{W_B}{M_B} \times \frac{1000}{W_A} \qquad \text{.....(iv)}$$

$$\therefore \frac{KM_A}{1000} = Kf$$

$$\Delta Tf = K_f \times \frac{W_B}{M_B} \times \frac{1000}{W_A} \qquad \text{.....(iv)}$$

i{kkUrj dju ij

;k $\quad M_B = \dfrac{K_f \times W_B \times 1000}{\Delta Tf \times W_A}$

tgk M_B = foy; dk v.kHkkj

K_f = ekyy DoFkukd mUu;u fLFkjkad

ΔTf = DoFkukd e voueu

W_A = foyk;d dk Hkkj

W_B = foy; dk Hkkj

mRRkj 12 fl) djuk g &$\Delta G = \Delta H - T\Delta S$

fdlh fudk; dh eDr Åtk] Åtk dh og ek=k g tk vf/kdre mi;kxh dk; e ifjofrr gkrh g eDr Åtk d eku dk fLFkj rki ,o nkc ij ifjdfyr djr g eDr Åtk dk fuEukulkj l ifjdfyr djr g&

$$G = H - TS \qquad .....(i)$$

pfd] $H = E + PV$

$$G = E + PV - TS \qquad .....(ii)$$

eDr Åtk voLFkk Qyu g vr%

$$\Delta G = \Delta E + \Delta(PV) - \Delta(TS) \qquad .....(iii)$$

$$\Delta G = \Delta E + P\Delta V + V\Delta P - T\Delta S - S\Delta T \qquad .....(iv)$$

eDr Åtk ifjoru d le; rki ,o nkc fLFkj gk rc

T =fLFkj] $S\Delta T = 0$

P =fLFkj] $V\Delta P = 0$

leh- (iv) l

$$\Delta G = \Delta E + P\Delta V - T\Delta S$$

pfd $\Delta H = \Delta E + P\Delta V$] ΔH = ,UFkYih ifjoru

vr% $\Delta G = \Delta H - T\Delta S$ bfr fl)e

bl gh fxC l gYegkYVt lehdj.k dgr gA

¼vFkok½

ΔG fdLkh jkLkk,kfUkd vfHkfØ,kk dh L0kRk% lk0kfRkRkk dh EkRk g Å"EkkXkfRk d lkFkEk fUk,kEk Lk $\Delta E = q + w$

q = Rk«k }kjk v0k'kkf"kRk m"Ekk

ΔE = vkRkfjd ÅTkk lkfj0kRkUk

w = Rk«k lkj fd,kk Xk,kk dk,k gA

,kfn gEk fdLkh Rk«k }kjk fd,k Xk,k dk,k dh Xk.kUkk djUkh gk Rkk w d LFkkUk lkj &w YkUkk lkMXkk vRk% $\Delta E = q - w$

$$q = \Delta E + w$$

Rk«k }kjk fd,kk Xk,kk dk,k w lkLkkj dk,k vkj vlkLkkj dk,k nkUkk dk ,kkXk g A vlkLkkLkj dk,k d mlk,kkXk dk,k d :lk Ek lk,kDRk fd,kk Tkk Lkdkk gA mLk vnkCk

vk,kRkUk dk,k mIk,kkXkh dk,k dgRk gA

vRkk $q = \Delta E + w_{\exp} + w_{non\exp}$

Ikj Rk $w_{\exp} = p\Delta V$ ¼fLFkj nkCk Ikj½

$q = E + p\Delta V + w_{non\exp}$

fLFkj nkCk Ikj ,UFkYIkh Ikfj0kRkUk

$$\Delta E + p\Delta V = \Delta H$$

vRkk $q = \Delta H + w_{non\exp}$

fLFkj RkkIk Ikj mRØEk.kh,k IkØEk d fYk,

$$\Delta S = \frac{q_{reu}}{T} \quad ,kk \quad q_{reu} = T\Delta S$$

RkCk $T\Delta S = \Delta H + w_{non\exp}$

$\Delta H - T\Delta S = -w_{non\exp}$

$\Delta H - T\Delta S = \Delta G$ ¼fLFkj RkkIk ,Ok nkCk Ikj ½

vRkk $\Delta G = w_{non\exp}$

$\boxed{\& \Delta G = w_{non\exp}}$

mRRkj 13

	HkkfRkd vf/k'kk"k.k &		jLkk,kfUkd vf/k'kk"k.k &
1-	bLkEk vf/k'kk"k.k vkj vfHk'kk"k.k d CkhPk ok.Mj ckYl vkd"k.k nCkYk HkkfRkd CkYk YkXkRkk gA Tkk vR,kRk nCkYk CkYk gkRkk gA	1-	bLkEk vf/k'kk"k.k vkj vfHk'kk"k.k d CkhPk jkLkk,kfUkd Ck/k CkUkRk g vkj mUkd CkhPk IkCkYk jkLkk,kfUkd CkYk YkXkRkk gA
2-	vf/k'kk"k.k m"Ekk dk EkkUk ¼20 l 40kj/mol^{-1}½dEk gkRkk gA	2-	vf/k'kk"k.k m"Ekk dk EkkUk ¼20 l 40kj/mol^{-1}½ vf/kd gkRkk gA
3-	,kg mRØEk.kh,k iØe gA	3-	,kg vUkRØEk.kh,k IkØEk gA
4-	,kg RkRdkYk gkUk OkkYkk IkØEk gA	4-	bLkdk OkXk vf/k'kk"k.k ,Ok vf/k'kk"k.k d LOkHkkOk Ikj fUkHkj djRkk g Ekn ,kk RkhOk gk Lkd Rkk gA

¼vFkok½

	æ0k LUkgh dkYkkbMYk &	æ0k f0kjk/kh dkYkkbMYk &
1-	f0kYk¸k dk f0kYkk¸kd Ek ?kkYkUk lkj CkUkRkk gA	1- bUkdk CkUkkUk d fYk, f0k'k"k f0kf/k¸kk vlkUkkUkh lkMRkh gA
2-	¸k LFkk¸kh gkRk g bUkd LFkk¸khdj.k d fYk, LFkk¸khdkjd lknkFk fEkYkkUk dh vk0k'¸kdRkk Ukgh gkRkh gA	2- bUkd CkUkkRk LkEk¸k bUkEk LFkk¸khdkjd lknkFk fEkYkk¸kk TkkRkk gA ¸k vR¸kRk vLFkk¸kh gkRk gA
3-	bLkd LdUnUk d fYk, f0k|Rk vlk?kV; dh vf/kd Ekk«kk dh vk0k'¸kdRkk gkRkh g	3- f0k|Rk vlk?kVî dh vR¸kRk dEk Ekk«kk Hkh bUg LIkfnRk dj nRkh gA
4-	dkYkkbMYkh f0kYk¸kUkk d d.kk d LkkFk vf/kdRkk Ek f0kYkk¸kd TkYk d d.k TkM jgRk gA	4- bUk dkYkkbMh f0kYk¸kUkk d d.k d LkkFk f0kYkk¸kd d d.k TkM Ukgh gkRk gA

mÙkj 14- 1- lkkVf'k¸kEk gDLkk Lkk¸kukQjV (II)

2- gDLkk ,EkhUk dkCkkYV (III) ¶ykjkbM

3- lkkVf'k¸kEk VVk vk¸kkMkEkjD¸kjV (II)

4- VVk ,EkhUk dklkj (II) LkYQV

¼vFkok½

1- $K_3[Fe(CN)_6]^{III}$

2 $K[Ag(CN)_2]^{II}$

3 $[Ni(CN)_4]$

4 $[Ni(CO)_4]$

mRRkj 15- (1) $Cu(s)|Ag^{2+}(aq)1M||Ag^{+}(aq)1M|Ag(s)$

$E^o = E^o_{cathode} - E^o_{Anode}$ ¼1 HkkXk lkj 2 vd ½

$E^o = 0.80 - 0.34$ ¼2 j HkkXk lkj 3 vd ½

$E^o = 0.46V$

dFkkM – Ag ,UkkM – Cu

½2½ **XkYOkUkh LkYk &** **f0k|Rk vIk?kVUkh LkYk**

1- bLkEk jLkk¸kfUkd ÅTkk dk f0k|Rk Ek Ikfj0kRkUk gkRkk gA

1- bLkEk f0k|Rk ÅTkk dk jkLkk¸kfUkd ÅTkk Ek Ikfj0kRkUk gkRkk gA

2- bLkEk Cathode (+) RkFkk Anode (–) /k0k gkRkk g

2- bLkEk Cathode (–) RkFkk Anode (+) /k0k gkRkk g

3- bLkEk nkUkk electrodes vYkXkk& vYkXk f0kYk¸kUk Ek MCk jgRk g mnkgj.k&MfUk¸kYk LkYk

3- bLkEk nkUkk electrodes ,d gh f0kYk¸kUk Ek MCk jgRk gA mnkgj.k &UkYLkUk LkYk

¼vFkok½

(1) Zn(s)|Zn^{++}(aq).5||Ag^{+}(aq)10M|Ag(s) dk 298K ij EMF dh x.kuk

($E^oAg = 0.789$, $E^oZn = -0.760$)

gy & ly foHko dk leh dj.k&

$$E_{cell} = E^o_{RHS} - E^o_{LHS} + \frac{2.303RT}{2F} + \log 10 \frac{[Ag^+(aq)]}{[Zn^{++}(aq)]}$$

$$E_{cell} = [0.798 - (-0.760)] + 2 \times \frac{2.303RT}{2F} + \log_{10} \frac{[10]}{[0.5]}$$

$E_{cell} = 1.558 + 0.059 \log_{10} 20$

$E_{cell} = 1.558 + 0.059 \times 1.3010$

$E_{cell} = 1.634V$

½2½ ikFkfed ly ,oa f}rh;d ly esa nk vrj

ikFkfed LkYk & **f}rh;d ly**

1- ikFkfed ly ,d ckj mi;kx d ckn iuk vkof'kr ugh fd;k tk ldrk gA

1- f}rh;d ly dk mi;kx d ckn iuk vkof'kr fd;k tk ldrk gA

2- jklk;fud vfHkfØ;k doy ,d fn'kk esa gkrh gA

2- jklk;fud vfHkfØ;k nkuk fn'kk esa gkrh gA

mÙkj 16- IkFkEk dkfV dh vfHkfØ;kk d fYk;k nj fLFkjkd dk fUk/kkj.k ¼LkEkkdYkUk dh f0kf/k }kjk½

,d LkkEkkU;k vfHkfØ;kk Ikj f0kPkkj djUk Ikj

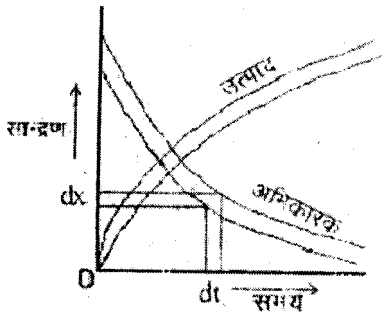
A → fØ;kk QYk

A $a_{gm\ M/L}$

;fn t = T, rc

$(a-x)_{gm\ M/L}$

æ0;kkUkIkkRkh fØ;kk d fUk;kEkkUkLkkj



^vfHkdkjd dh vfHkfØ;kk dh XkfRk mLkd LkfØ;k Ekk«kk d LkEkkUkIkkRkh gkRkk gA**

vRkk $\frac{dx}{dt} \propto (a-x)$ .....(i)

$\frac{dx}{dt} = K(a-x)$ .....(ii)

Ik{kkRkj djUk Ikj

$\frac{dx}{(a-x)} = Kdt$ .....(iii)

LkEkkdYkUk djUk Ikj

$\int_{x_2}^{x_1} \frac{dx}{(a-x)} = K\int_2^1 dt$ .....(iv)

$ln(a-x) = Kt + I_0$ .....(v)

;kfn $x = 0, t = 0$ .....(vi)

LkEkh dj.k (v) Ek Lk (vi) l I_0 dk EkkUk j[kUk Ikj

$-ln(a-x) = Kt + (-lna)$

$\frac{lna}{ln(a-x)} = Kt$

Ik{kkRkj djUk Ikj

UkPkjYk YkkXk dk LkkEkkU;k YkkXk Ek Ikfj0kRkUk Lk

$K = \frac{1}{t} ln\frac{a}{(a-x)}$ ¾ $\frac{2.303}{t}\log\frac{a}{(a-x)}$

¼vFkokk½

mÙkj 16 'kU;kdkfV dh vfHkfØ;kk d fYk, vfHkfØ;kk dh nj vfHkdkjdk d Lkkæ.k d 'kU;k ?kkRk d LkEkkUkIkkRkh gkRk gA

vfHkfØ;kk R $\rightarrow$ Prodc. Ek

nj ¾ $\frac{-d[R]}{dt} = k[R]^{o}$ ....(i)

nj ¾ $\frac{-d[R]}{dt} = k \times 1$ D;kfd $[R^{o}] = 1$

$d[R] = -kdt$ ....(ii)

nkUkk vkj dk LkEkkdYkUk djUk Ikj

$[R] = -kt + 1$ ....(iii)

tc $t = 0$ g RkCk $[R] = [R]_0$ ¼R_0 vfHkdkjd dk Ikkjfhkd Lkkæ.k½

; EkkUk LkEkhdj.k (iii) Ek j[kUk Ikj

$[R]_0 = k \times 0 + 1$ ....(iv)

$I = [R]_0$ ....(v)

LkEkhdj.k (iii) vkj (v Lk

$[R] = -kt + [R]_0$ ....(vi)

$K = \frac{[R]_0 - [R]}{t}$

mRrj 17 **QkVkXkkQh d Ikn &**

1- **mnHkkLkUk &** dEkj d YkLk dk 0kLRk Ikj dfæRk dj dN Lkd.M d fYk, Ikdk'k MkYkRk g bLk mnHkkLkUk dkYk dgRk gA bLkLk 0kLRk dk fPk«k IYkV Ikj vk TkkRkk gA

$2AgBr \rightarrow Ag_2Br + Br$

2- **M0kYkfIkXk djUkk &** fD0kUkkYk] Ikkbjk XkYkkYk gkbMkfD0kUkkUk ;kk fEkMkYk dk {kkjh;k ?kkYk M0kYk Ikj gkRkk g Tkk fd $AgBr$ d Ag Ek vIkPk;kUk dk Ik.k dj nRkk g bLkLk fUkXkfV0k IkkIRk gkRkk gA

$C_6H_4(OH)_2 + 2AgBr \rightarrow C_6H_4(OH)_2 + 2Ag\downarrow + 2HBr$

3- **fLFkjhdj.k &** LkkfM¸kEk Fkk¸kkLkYQV ¼gkbIkk f0kYk¸kUk dk mIk¸kkXk fUkXkfV0k d fLFkjhdj.k gRk fd¸kk TkkRkk g vIk¸kDRk *AgBr* gkbIkk Ek ?kYkdj vYkXk gk TkkRkk g½

$$AgBrNa_2S_2O_3 \rightarrow Na[AgS_2O_3] + NaBr$$

4- fIkfVXk & fIkfVXk IkIkj Ikjf UkXkfV0k d }kjk Ikdk'k MkYkdj dN LkEk¸k d fYk, j[kk TkkRkk g fTkLkLk IkIkj Ikj 0kLRk dh Lkgh fPk«k vfdRk gk TkkRkk g fIkfVXk IkIkj Ikj *AgCl* fTkYkVhUk dk YkIk gkRkk gA bLk /kkdj Lk[kk YkRk gA

5- VkfUkXk ¸kk jXk LkLkdj.k & dkYk LkQn fPk«k dk PkEkdhYkk CkUkkUk gRk $AgCl_3$ dk f0kYk¸kUk mIk¸kkXk fd¸kk TkkRkk g fTkLk VkfUkXk dgRk gA

$$AuCl_3 + 3Ag \rightarrow 3AgCl + Au$$

¼vFko½

1- v;Ld dk l= %& dkIkj Ikkbjkb VhTk $Cu_2S.Fe_2S_3$ ¸kk $CuFeS_2$ 1 vd

2- v¸kLd dk Lkkæ.k %& dkIkj d LkYQkbM v¸kLd dk Lkkæ.k QUk mRIYkk0kUk f0kf/k Lk fd¸kk TkkRkk gA IkhLk g, v¸kLd $CuFeS_2$ dk IkkUkh Lk Hkj gkTk Ek MkYk fn¸kk TkkRkk g] RkRIkÜPkkRk PkhM ¸kk ¸kdkfYkIVLk dk RkYk MkYkdj 0kk¸k dh RkYk /kkjk Ik0kkfgRk djUk Ikj v¸kLd ÖkkXk d Åkj RkjRkk gA fTkLk vYkXk dj fYk¸kk TkkRkk g vkj v'kf)¸kk UkhPk CkB TkkRkh g] bUkdk vYkXk dj fYk¸kk TkkRkk gA 1 vd

3- HkTkUk %& $2CuFeS_2 + O_2 \rightarrow Cu_2S + 2FeS + SO_2$

$2FeS + 3O_2 \rightarrow 2FeO + 2SO_2$

$Cu_2S + 3O_2 \rightarrow 2Cu_2O + 2SO_2$

IkXkYkUk %& $Cu_2O + FeS \rightarrow Cu_2S + FeO$ 1½ vd

$FeO + SiO_2 \rightarrow FeSiO_3$

4- EkV d ?kVd D¸kIkLk LkYQkbM RkFkk QjLk LkYQkbM gA 1 vd]

$(Cu_2S + FeS)$

5- 'kk/kUk Ek Ik¸kDRk ,d f0kf/k f0k|Rk vIk?kVUk gA vFk0kk vU¸k LkEkd{k f0kf/k dk UkkEk ½ vd

mÙkj 18 vkLVOkkYM f0kf/k Lk UkkbfVd vEYk d fUkEkk.k dk fLk)kRk

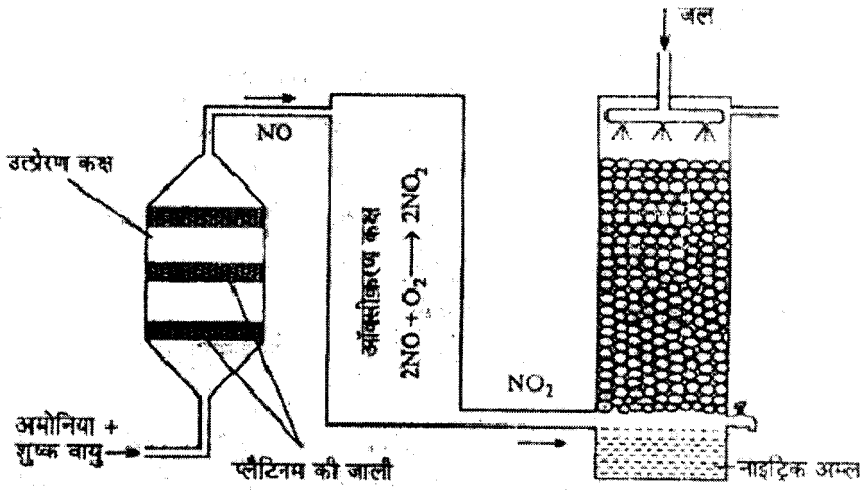
1 vk,kRkUk vEkkfUk,kk vkj 8 vk,kRkUk Okk,k dk fEkJ.k Pt dh TkkYkh d Åkj 800 808ºC RkkIk Ikj IkOkkfgRk fd,kk TkkRkk g Rkk 90 IkfRk'kRk vEkkfUk,kk dk Ukkbfvd vkDLkkbM Ek vkDLkhdj.k gk TkkRkk gA

$$4NH_3 + 5O_2 \rightarrow 4NO + 6H_2O$$

TkYk fEkYkkUk Ikj Ukkbfvd vEYk CkUkRkh gA

$$2NO + O_2 \rightarrow 2NO_2$$
$$2NO_3 + H_2O \rightarrow HNO_2 + HNO_3$$
$$3HNO_2 \rightarrow HNO_3 + H_2O + 2NO$$

UkkEkkfdRk fPk«k %&



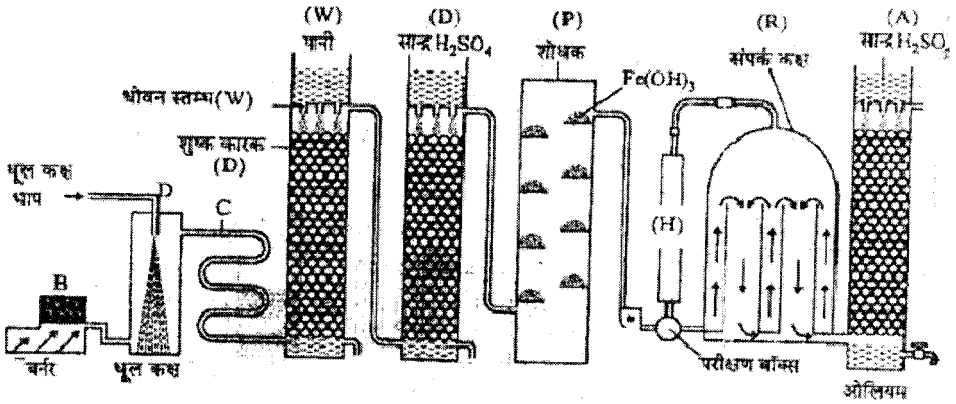
¼vFkOkk½

H_2SO_4 d LkIkd d{k f0kf/k dk fLk)kRk &

'k) ,Ok 'k"d SO_2 RkFkk Okk,k d fEkJ.k dk mRIkjd V_2O_5 Ikj IkOkkfgRk djUk Lk Okg SO_3 Ek vkDLkhÑRk gk TkkRkk g Tkk TkYk Lk fØ,kk djd H_2SO_4 CkUkkRkk g

$$2SO_2 + O_2 \rightarrow 2SO3 + 45.2\ Kcal$$
$$SO_3 + H_2O \rightarrow H2SO_4$$

UkkEkkfdRk j[kkfPk«k



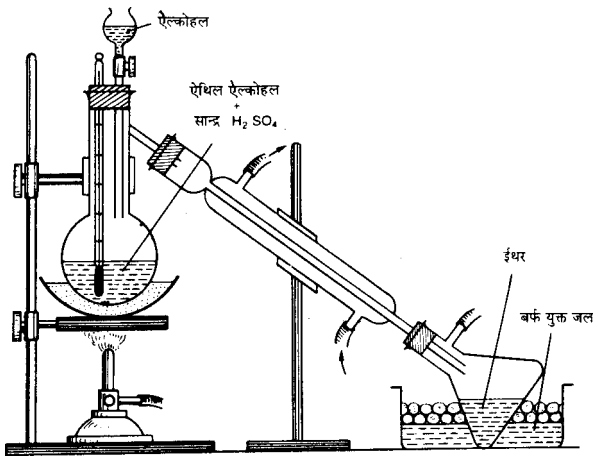
mÙkj 19- ¼1½ Ik,kkXk'kkYkk Ek Mkb,fFkYk bFkj CkUkkUk dh f0kf/k dk jkLkk,kfUkd lehdj.k

$$C_2H_5OH + H_2SO_4 \xrightarrow{110^\circ} C_2H_5HSO_4 + H_2O$$

,fFkYk vYdkgYk

$$C_2H_5HSO_4 + HOC_2H_5 \xrightarrow{140^\circ} C_2H_5OC_2H_5 + H_2SO_4$$

¼2½ UkkEkkfdRk fPk«k &



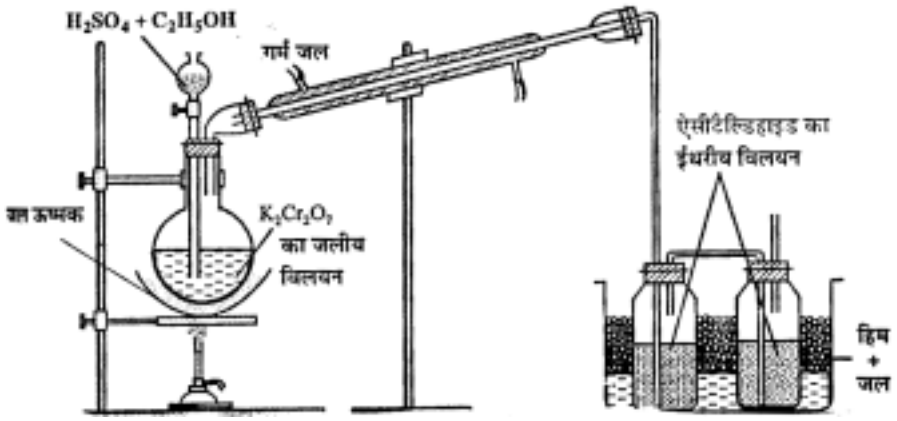
¼3½ f0kf/k dk Lkf{kIRk 0k.kUk & vkLk0kUk ¶YkkLd Ek 100ml Ikfj'k) C_2H_5OH ,0k 50ml Lkkæ H_2SO_4 Ykdj CkkYk Å"Ekd Ikj XkjEk djRk g RkkIk 140°C Ikj j[kk TkkRkk g A CkQ fEkYk TkYk Lk j[k g, Xkkgh ¶YkkLd Ek bFkj ,d«k dj fYk,kk TkkRkk gA

¼vFk0kk½

¼1½ ,fLkVfYMgkbM fUkEkk.k d fYk, jkLkk,kfUkd LkEkhdj.k%&

$$CH_3CH_2OH + [O] \xrightarrow{K_2Cr_2O_7} CH_3CHO + H_2O$$,fLkVfYkgkbM

¼2½ UkkEkkfdRk fPk«k &



¼3½ fof/k dk lf{kIr o.ku %&

25gm $K_2Cr_2O_7$ dk 100ml TkYk Ek ?kkYkdj ,d XkkYk Iknh d ¶YkkLd Ek YkRk gA fCkndkjh dhIk Ek 35ml, C_2H_5OH RkFkk 20ml cmc H_2SO_4 dk fEkJ.k Ykdj ¶YkkLd dk TkYk m"Ekd Ikj FkkMk XkEk djRk gA CkUkh Okk"Ik Lk?kfj«k Lk XkTkjRkh g CH_3CHO dh Okk"Ik BM dkUkhdYk ¶YkkLd Ek Lk?kfj«k gkdj bFkjh¸k f0kYk¸kUk CkUkk YkRkh g bLk RkUk H_2SO_4 d LkkFk vkLkf0kRk djUk Lk 'k) ,LkhVfYMgkbM IkkIRk gkRkk gA ¼2]2]2 vd½

Set - B

gkbLdy lVhfQdV ijh{kk

High School Certificate Examination

lEiy&i'u i=

SAMPLE PAPER

fo"k; %& (Subject) - jlk;u **le; 3 ?k.Vk (Time- 3 Hrs)**

d{kk %& (Class) - 12oh **i.kkd 75 (M.M.)**

(Instruction) & ¼fun'k½

1- lHkh i'u gy djuk vfuok;z g A

Attempt all the Question

2- i'u Øekd 01 e 10 vd fu/kkfjr g A nk dky[k.M g A [k.M ^^v** e 05 cgfodYih; i'u rFkk [k.M ^^c** e 05 fjDr LFkkuk dh ifr vFkok mfpr lc/k tkfM, A iR;d i'u d fy, 1 vd vkcfVr g A

Q. No. 01 Carries 10 Marks. There are two sub-section, Section A is Multiple choice carries 05 marks and section B is fill in the blanks or match the column carries 05 marks.

3- i'u Øekd 02 l i'u Øekd 06 rd vfr y?kmRrjh; i'u g A iR;d i'u ij 02 vd vkcfVr g A mRrj dh vf/kdre 'kCn lhek 30 'kCn A

Q. No. 2 to 06 are very short answer type question & it carries 02 marks each. Word limit is maximum 30.

4- i'u Øekd 07 l i'u Øekd 10 rd y?kmRrjh; i'u g A iR;d i'u ij 03 vd vkcfVr g A mRrj dh vf/kdre 'kCn lhek 50 'kCn A

Q. No. 07 to 10 are short answer type question & it carries 03 marks each. Word limit is maximum 50.

5- i'u Øekd 11 l i'u Øekd 14 rd y?kmRrjh; i'u g A iR;d i'u e vkrfjd fodYi g vkj iR;d i'u ij 04 vd vkcfVr g A mRrj dh vf/kdre 'kCn lhek 75 'kCn A

Q. No. 11 to 14 are short answer type question & it carries 04 marks each. Each question has internal choice. Word limit is maximum 75.

6- i'u Øekd 18 l i'u Øekd 19 rd nh?kmRrjh; i'u gA iR;d i'u e vkrfjd fodYi gvkj iR;d i'u ij 06 vd vkcfVr gA mRrj dh vf/kdre 'kCn lhek 150 'kCn A

Q. No. 18 to 19 are long answer type question & it carries 05 marks each. Each question has internal choice. Word limit is maximum 150.

lk'Uk 1- ¼v½ Ckgf0kYlkh¸k i'u

1- O_2^{--} Ek vkCk/kh bYkDVkUkk dh Lk[¸kk g&

¼v½ 4 ¼c½ 6

¼l½ 8 ¼n½ 10

2- vfØLVYkh¸k BkLk lknkFk g&

¼v½ XkQkbV ¼c½ ,dUkRkk{k Xk/kd

¼l½ dkPk ¼n½ 'Ok Rk fVUk

3- vkLV0kkYM dk fUk¸kEk fdLk lkdkj d f0k|Rk vlk?kVîk d f0kYk¸kUkk lkj YkkXk gkRkk g&

¼v½ lkCkYk f0k|Rk vlk?kVî ¼c½ nCkYk f0k|Rk vlk?kVî

¼l½ ¼v½ Ok ¼Ck½ nkUkk Ek ¼n½ mlkjkDRk Ek Lk dkb Ukgh A

4- Ývkuk g&

¼v½ CCl_2F_2 ¼c½ CCl_3F_3

¼l½ CF_4 ¼n½ mlkjkDRk Ek Lk dkb Ukgh A

5- vk¸kMkQkEk lkjh{k.k Uk nUk Ok kYkk ¸kkfXkd g&

¼v½ CH_3CHO ¼c½ C_2H_5OH

¼l½ $C_6H_5COCH_3$ ¼n½ $C_6H_5CH_2CH_2OH$

Que 1 (A) Objective type questions:

1. Bonding electrons in O_2^{--} are -

(a) 4 (b) 6

(c) 8 (d) 10

2. Amorphous solid is -

(a) graphite (b) monocline sulphur

(c) glass (d) white tin

3. Ostwald law is applicable on which type of electrolyte solutions -

(a) Strong electrolyte (b) Weak electrolyte

(c) A and B both (d) None of them

4. Freyon is -

(a) CCl_2F_2 (b) CCl_3F_3

(c) CF_4 (d) None of the above

5. Which compund not gives Idoform test -

(a) CH_3CHO (b) C_2H_5OH

(c) $C_6H_5COCH_3$ (d) $C_6H_5CH_2CH_2OH$

¼c½ fjDr LFkkuk dh ifr dhft,&

1- 25ºC Ikj TkYk d fYk, PKw dh EkkUk &&&&&&&&&& gA

2- HkkTkUk Ek vk,kkfMUk dh dEkh Lk &&&&&&jkXk gkRkk gA

3- QkEkYkfMgkbM vf/kd LkEk,k Rkd j[kk jgUk Ikj &&&&&&&&nRkk gA

4- IkfUkfLkfYkUk dh [kkTkdRkk 0kKkfUkd &&&&&&&&&&gA

5- vkDLkhTkUk v.k IkÑfRk Ek &&&&&&&&gkRkk gA

(B) Fill in the Blanks -

1. The value of PKw for water at 25ºC is .....

2. From lack of iodine in diet ..... disease.

3. Farmaldehyde converted into ..... to keep opened for a long time.

4. The penicillin was discovered by .....

5. Oxygen molecule in nature is .....

Ik'Uk 2- CkQj f0kYk,kUk dh Ikfjhkk"kk nhfTk,A ,d vEYkh,k CkQj f0kYk,kUk dk mnkgj.k fYkf[k, A

Define buffer solution. Write one example of acidic buffer solution.

Ik'Uk 3- LkEkg f0kLFkkIkUk fUk,kEk D,kk g\ LIk"V dhfTk, A

What is Group displace law? explain it.

Ik'Uk 4- DYkkfjUk d nk vkDLkh vEYkk d UkkEk 0k Lk«k fYkf[k, \

Write the name and chemical formulae of two oxy-acids of chlorine.

Ik'Uk 5- gkQ EkUk EkLVM vk,kYk vfHkfØ,kk D,kk g\

What is Hofmann's mustard oil Reaction?

Ik'Uk 6- dkb nk T0kj Ukk'kd vk"kf/k;k dk UkkEk ,0k Lk«k fYkf[k,A

Write the name and chemical formulae of any two antipyretic medicines.

Ik'Uk 7- ,d RkR0k dh BCC Lkj PkUkk gA bLkd bdkb LkYk Ek fd RkUk Ikj Ekk.k gA

An element's Structure is BCC. How many atoms are in an unit cell of it?

Ik'Uk 8- Ck/k ØEk fdLk dgRk g\ N_2 d v.k d Ck/kUk ØEk dh Xk.kUkk dhfTk, A

What is bond order? Calculate the bond order of N_2 molecule.

Ik'Uk 9- ,fYdYk Lkk,kUkkbM vkj ,fYdYk vkbLkk Lkk,kUkkbM Ek dkb RkhUk vRkj fYkf[k, A

Write any three differences between alkyl cyanide and alkyl iso-cynide.

Ik'Uk 10- jfM,kk ,fDV0kRkk d dkb RkhUk mIk,kkXk fYkf[k, A

Write any three uses of radio-activity.

Ik'Uk 11- D0kFkUkkd Ek mUUk,kUk d vk/kkj Ikj v0kk"Ik'khYk f0kYk,k IknkFk dk v.kHkkj KkRk dhfTk,A

Determine the molecular mass of a non volatile solute with teh help of elevation of boiling point.

¼vFk0kk½

fgEkkd Ek v0kUkEkUk d vk/kkj Ikj v0kk"Ik'khYk f0kYk,k IknkFk dk v.kHkkj KkRk dhfTk,A

Determine the moleculr mass of non volatile solute with the help of depression in freezing point.

Ik'Uk 12- fLk) dhfTk, fd $\Delta G = \Delta H - T\Delta S$

Prove that $\Delta G = \Delta H - T\Delta S$

¼vFk0kk½

fLk) dhfTk, fd $-\Delta G = W_{non-\exp ansion}$

Prove that $-\Delta G = W_{non-\exp ansion}$

Ik'Uk 13- HkkfRkd ,0k jkLkk,kfUkd vf/k'kk"k.k Ek Pkkj vRkj fYkf[k, \

Write any four differences betwen physical adsorption and chemical adsorption.

¼vFk0kk½

æ0k LUkgh dkYkkbM ,0k æ0k f0kjk/kh dkYkkbM Ek Pkkj vRkj fYkf[k,\

Write any four differences between Lyophilic and Lyophobic colloids.

Ik'Uk 14- fUkEUk ;kfxdk d vkb-,k-Ikh-,-Lkh- UkkEk fYkf[k,

Write the I.U.P.A.C. name of the following compounds.

¼1½ $K_4[Fe(CN)_6]$

¼2½ $[Co(NH_3)_6]Cl_3$

¼3½ $K_2[HgI_4]$

¼4½ $[Cu(NH_3)_4]SO_4$

¼vFkok½

fUkEUkfYkf[kRk d Lkjpkukk Lk«k fYkf[k, &

1- IkkVf'k,kEk Qjh (III) Lkk,kUkkbM

2- IkkVf'k,kEk Mkb Lkk,kUkk vTkUVV (I)

3- VV Lkk,kUkk fUkfdYkV (II) vk,kUk

4- VVk dkCkkfUkYk fUkfdYk (O)A

Write the structural formulae of the following compounts -

1. Pot. ferr. (III) cyanide
2. Pot. Di cyano argentate (I)
3. Tetra Cyano Nickelate (II) ion
4. Tetra carbonyl Nickle (O)

Ik'Uk 15¼1½ UkhPk fn,k Xk, LkYk d E^o Xk.kUkk dhfTk, &

$E^o_{Ag^+/Ag}$ = (+) 0.80V, $E^o_{Cu^{+2}/Cu}$ = +0.34V gA

¼2½ XkY0kUkh LkYk 0k f0k|Rk vIk?kVUkh LkYk Ek dkb nk vRkj fYkf[k,A

(1) Calculate the E^o of the following cell -

$E^o_{Ag^+/Ag}$ = (+) 0.80V, $E^o_{Cu^{+2}/Cu}$ = +0.34V

(2) Write any two differences between Galvanic cell and Electrolytic cell.

¼vFkok½

¼1½ LkYk Zn(s) | Zn++ (aq.) || Ag+(aq.) (1.0)M | Ag(s) (1.0M) dk 298K Ikj EMF KkRk djk A ($E^o_{Ag^+/Ag}$ = 0.789V, $E^o_{Zn^{2+}/Zn^-}$ = –0.76V)

¼2½ IkkFkfEkd LkYk ,0k f}Rkh,kd LkYk Ek nk vRkj fYkf[k, \

(1) Calculate the EMF of the following cell at Zn(s) | Zn++ (aq.) || Ag+(aq.)

10M | Ag(s) (1.0M) [Give that $E^{o}_{Ag^{+}/Ag} = 0.789V$, $E^{o}_{Zn^{2+}/Zn^{-}} = -0.76V$]

(2) Write any two differences between primary and secondary cell.

Ik'Uk 16- IkFkEk dkfV dh vfHkfØ;kk d fYk, nj fLFkjkd dh Xk.kUkk LkEkkdYkUk f0kf/k Lk dhfTk, A

Calculate the rate constant of first order reaction from integrated method.

¼vFkOkk½

'kU;k dkfV dh vfHkfØ;kk d fYk, nj fLFkjkd dh Xk.kUkk LkEkkdYkUk f0kf/k Lk dhfTk, \

Calcualte the rate constant of zero order reaction from integrated method.

Ik'Uk 17- QkVkXkkQh d fUkEUk Iknk dk LkEkÖkkb;k&

1- mnHkkLkUk

2- M0kYkfIkXk

3- fLFkjhdj.k

4- fIkfVXk

5- VkfUkXk ;kk jXk LkLdj.k

Explain photography on following points -

(i) Exposure

(ii) Developing

(iii) Fixation

(iv) Printing

(v) Toning

¼vFkOkk½

dkIkj Ikk;kjkbVhTk Lk RkkCkk d fUk"d"k.k d fUkEUk Iknk dk LkEkÖkkb;k\

1- v;kLd dk Lk«k

2- v;kLd dk Lkkæ.k

3- HkTkUk ,0k IkXkYkUk Iknk Ek Ik;kDRk jkLkk;kfUkd vfHkfØ;kk

4- EkV d ?kVd

5- 'kk/kUk Ek Ik;kDRk ,d f0kf/k dk UkkEk A

Explain the extraction of copper from copper pyrites in the following points -

(i) Formula of ore

(ii) Concentraction of ore

(iii) main reactions in roasting

(iv) component of matte

(v) name of one method involved in purification method.

Ik'Uk 18- vkLVOkkYM f0kf/k Lk Ukkbfvd vEYk d fUkEkk.k dk fUkEUk fCknvk d vk/kkj Ikj fYkf[k,&

1- fLk)kRk

2- UkkEkkfdRk fPk«k

3- Ik,kDRk jkLkk,kfUkd vfHkfØ,kk,

Explain the manufacture of nitric acid from Ostwald method in the following points -

(i) Principle

(ii) Labelled diagrame

(iii) chemical reaction used in the process.

¼vFkOkk½

LkY¶,kfjd vEYk d fUkEkk.k dh LkIkd f0kf/k dk 0k.kUk fUkEUk fCknvk d vk/kkj Ikj dhfTk, &

1- fLk)kRk

2- UkkEkkfdRk fPk«k

3- Ik,kDRk jkLkk,kfUkd vfHkfØ,kk,A

Explain the manufacture of Sulphuric acid from contact proces in the following points -

(i) Principle

(ii) Labelled diagrame

(iii) Chemical reactions used in the process.

Ik'Uk 19- Ik,kkXk'kkYkk Ek Mkb,fFkYk bFkj d fUkEkk.k dk fUkEUk fCknvk d vk/kkj Ikj fYkf[k,&

1- jkLkk,kfUkd LkEkhdj.k

2- UkkEkkfdRk fPk«k

3- f0kf/k dk Lkf{kIRk 0k.kUk

Explain the Lab. method preparation diethyl ethes in the following points-

(i) Chemical equation

(ii) Labelled diagrame

(iii) Method in brief.

¼vFkOkk½

Ik,kkXk'kkYkk Ek ,fLkVfYMgkbM dk fUkEkk.k fUkEUk fCknvk d vURkXkRk dhfTk, &

1- jkLkk,kfUkd LkEkhdj.k

2- UkkEkkfdRk fPk«k

3- f0kf/k dk Lkf{kIRk 0k.kUk A

Explain the Lab method preparation of CH_3CHO in the following points-

(i) Chemical equation

(ii) Labelled diagrame

(iii) Method in brief.

vkn'k mÙkj LkV&Ckh

mÙkj 1¼v½ 0kLRkfUk"B

1- ¼n½

2- ¼l½

3 ¼c½

4 ¼v½

5 ¼n½

¼Ck½ fjDRk LFkkUk Hkjk &

1 14

2 ?k?kkjkXk

3 VkbvkfDLkUk

4 vYkDTkMj ¶YkfEkXk

5 vUkPkCkdh¸k

mÙkj 2 ,Lkh nCkYk vEYk RkFkk mLkd YkOk.k ¸kk nCkYk {kkj RkFkk mLkd YkOk.k f0kYk¸kUk Ek FkkMh Ekk«kk Ek vEYk ¸kk {kkj fEkYkk nUk Lk bLkd pH EkkUk Ek dkb Ikfj0kRkUk Ukgh gkRkk] CkQj f0kYk¸kUk dgYkkRkk gA ¼1 vd½

mnkgj.k d fYk, ,LkhfVd vEYk 0k LkkfM¸kEk ,LkhVV dk f0kYk¸kUk vEYkh¸k CkQj dgYkkRkk gA ¼1 vd½

¼vFk0kk vU¸k LkEkd{k mnkgj.k½

mÙkj 3 LkEkg f0kLFkkIkUk fUk¸kEk & ,d α&d.k mRLkTkUk Lk Uk, RkR0k dh vk0kRk Lkkj.kh Ek fLFkfRk EkYk Ikj Ekk.k Lk nk LFkkUk Ckk¸kh vkj RkFkk ,d β&d.k mRLkTkUk Lk Uk, RkR0k dh fLFkfRk ,d LFkkUk nk¸kh vkj gkRkk gA

mRRkj 4 DYkkjhUk d nk vkDLkh vEYkk d UkkEk 0k Lk«k

1- gkbIkkDYkkjLk vEYk & $HClO$ ¼1 vd½

2- DYkkfjd vEYk && $HClO_3$ ¼1 vd½

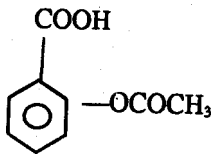
¼vFk0kk vU¸k dkb LkEkd{k UkkEk½

mÙkj 5 gkQEkUk EkLVM vk¸ky vfHkfØ¸kk & IkkFkfEkd ,EkhUk dk dkCkUk Mk¸kl YQkbM vkj EkjD¸kfjd DYkkjkbM d LkkFk gYdk XkEk djUk Ikj ,fLdYk vkbLkkFkk¸kk

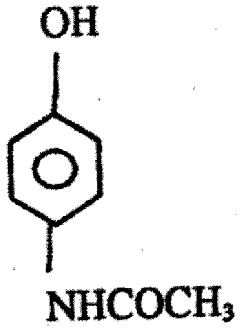
Lkk¸kUkV CkUkRkk gA fTkLkdh Xk/k LkjLkk d RkYk TkLkh gkRkh gA 1 vd

mÙkj 6 TOkjUkk'kd vk"kf/k Lk«k

1- ,fLIkjhUk



2- IkjkfLkVkEkkYk



mRRkj 7- RkROk fTkLkdh BCC LkjPkUkk g] bLkd bdkb LkYk Ek nk IkjEkk.k gA vd 3

mRRkj 8 Ck/k&ØEk& ¸kg nk IkjEkk.kvk d CkhPk CkUk Ck/k dh LkkEkF¸k dh EkkIk gA Ck/k&ØEk dk Ck/kh ,Ok fOkIkjhRk Ck/kh v.k d{kdk d bYkDVkUkk d vFk vRkj d :Ik Ek IkfjHkkf"kRk fd¸kk TkkRkk gA

Ck/k&ØEk ¸kk vkCk/k&dkfV ¾ ½[Nb – Na] 1 vd

Tkgk Nb = Ck/kh vk.kfOkd d{kdk Ek bYkDVkUkk dh Lk[¸kk

Na = fOkIkfjRk Ck/kh vk.kfOkd d{kdk Ek bYkDVkUkk dh Lk[¸kk

N_2 v.k d Ck/kUk ØEk dh Xk.kUkk

N IkjEkk.k dk bYkDVkUk foU;kl $\rightarrow 1s^2, 2s^2, 2p^3$

UkkbVkTkUk Ek Ck/kh vk.kfOkd d{kdk Ek bYkDVkUkk dh Lk[¸kk ¾ 8

foijhr Ck/kh vk.kfOkd d{kdk Ek bYkDVkUkk dh Lk[¸kk ¾ 2

vRkkCk/k&ØEk ¾ $\frac{8-2}{2}$ ¾ 3 ¸kk $N \equiv N$ 2 vd

mRRkj 9- **,fYdYk Lkk¸kUkkbM** **,fYdYk vkbLkkLkk¸kUkkbM &**

1- ¸kg TkYk Ek fOkYk¸k g 1- ¸kg TkYk Ek vYIk fOkYk¸k g

2- ¸kg vEYkh¸k TkYk&vIk?kVUk ij dkckfD lfyd vEy rFkk vEkkfUk¸kk nRkk gA

2- ¸kg vEYkh¸k TkYk&vIk?kVUk Ikj vEYk RkFkk IkkFkfEkd ,EkhUk nRkk gA

3- ¸kg vlkPk¸kUk lkj lkkFkfEkd ,EkhUk CkUkkRkk gA

¼vFkkZk vU¸k dkb LkEkd{k vRkj½

3- ¸kg vlkPk¸kUk lkj f}Rkh¸kd ,EkhUk CkUkkRkk gA

lkR¸kd Lkgh mÙkj lkj 1]1]1 vd

mRRkj 10 jfM¸kk ,fDV0kRkk d RkhUk mlk¸kkXk fUkEUkfYkf[kRk g&

1- Ñf"k Ek & jfM¸kk ,fDV0k LkEkLFkkfUkdk dh Lkgk¸kRkk Lk lkk/kk }kjk m0kjd Xkg.k djUk dh nj RkFkk vUkd jkXkk dk v/¸k¸kUk fd¸kk TkkRkk gA

2- fPkfdRLkk d {k«k Ek & d l j d mlkPkkj Ek dkCkkYV &06 Lk lkklRk γ&f0kfdj.kk dk mlk¸kkXk djRk gA jfM¸kk QkLQkjLk (P-32) d }kjk Y¸kdfEk¸kk jDRk d®Lkj R0kPkk d jkXkk RkFkk vU¸k R0kPkk LkCk/kh jkXkk dk mlkPkkj fd¸kk TkkRkk gA

3- [kfUkTkk RkFkk Pkê kUkk dh vk¸k dk fUk/kkj.k & Hk&XkHk 'kkL«k d v/¸k¸kUk Ek RkFkk Xkgk d v/¸k¸kUk Ek [kfUkTkk RkFkk Pkê kUkk dh vk¸k dk vR¸kRk EkgR0klk.k gkRkk gA bLkd fYk, jfM¸kk ,fDV0kRkk mlk¸kkXkh gA

¼vFkkZk vU¸k dkb LkEkd{k mlk¸kkXk½ lkR¸kd Lkgh mlk¸kkXk lkj 1]1]1 vd A

mÙkj 11- fdLkh æ0k Ek v0kk"lk'khYk f0kYk¸k fEkYkkUk lkj bLkdk 0kk"lknkCk dEk gkRkk g A bLk dkj.k f0kYk¸kUk 'k) f0kYkk¸kd Lk vf/kd RkklkØEk lkj mCkYkRkk gA

f0kYk¸kUk RkFkk 'k) f0kYkk¸kd d D0kFkUkkd Ek vRkj dk f0kYkk¸kd d D0kFkUkkd Ek mUUk¸kUk dgRk gA bLk ΔTb Lk n'kkRk gA

EkkUkk 'k) f0kYkk¸kd dk D0kFkUkkd T_1 g RkFkk f0kYk¸kUk dk D0kFkUkkd T_2 g A D0kFkUkkd Ek mUUk¸kUk ΔTb ¾ $T_2 - T_1$ gkXkk A

fdLkh 0kk"lk'khYk lknkFk dk TkYk Ek ?kkYkUk lkj D0kFkUkkd Ek 0kf) æ0k d 0kk"lknkCk Ek v0kUkEkUk d LkEkkUklkkRkh gkRkh gA

$$\Delta Tb \propto \Delta p$$

Ykfd Uk $\Delta p \propto m$ ¼EkkYkYkRkk½

$$\Delta p \propto \Delta Tb \propto m \quad \text{.....(i)}$$

$$\Delta Tb \propto m \quad \text{.....(ii)}$$

vFkkRk D0kFkUkkd Ek mUUk¸kUk f0kYk¸kUk dh EkkYkYkRkk d LkEkkUklkkRkh gkRkk gA

¸kfn w XkkEk f0kYkk¸kd Ek w XkkEk f0kYk¸k ?kYkk g

$$\therefore \quad 1000 \text{ xke foyk;d e } \frac{w \times 1000}{w} \text{ xke foy;}$$

ekyyrk ¾ $\frac{w \times 1000}{w \times$ foy; dk v.kHkkj

¾ $\Delta Tb \propto \frac{w \times 1000}{w \times m}$ .....(iii)

LkEkhdj.k (ii) Ek EkkYkYkRkk m dk EkkUk j[kUk Ikj]

vFkOkk $\Delta Tb = \frac{1000 \times K_b \times w}{mw}$ .....(iv)

$m = \frac{1000 \times K_b \times w}{\Delta Tb.w}$ .....(v)

bLk Lk«k Ek ?kfYkRk Iknkfk dk v.kHkkj KkRk dj YkRk gA

IkR,kd Lkgh Ikn Ikj 1]1]1 vd

¼vFkOkk½

fdLkh f0kYk,kUk d fgEkkd dk v0kUkEkUk] f0kYk,kUk dh EkkYkYkRkk d LkEkkUkIkkRkh gkRkk gA

$\Delta Tp \propto m$

,kk $\Delta Tf = kf.m$ .....(i)

kf ¾ EkkYkYk fgEkkd v0kUkEkUk fLFkjkd]

;fn m ¾1 rk $\Delta Tf = kf$

vFkkr fdlh foy;u dk ekyd fgekd voueu fLFkjkd] f0kYkk,kd d fgEkkd Ek gb mLk dEkh d Ckjk Ckj g] Tkk ,d EkkYk v0kk"Ik'khYk f0kYk,k dk 100 XkkEk f0kYkk,kd Ek ?kkYkUk Ikj IkkIRk gkRkh gA

∴ 1000 xke foyk;d e $\frac{w \times 1000}{w}$ xke foy; gA

ekyyrk ¾ $\frac{1000$ XkkEk f0kYkk,kd Ek f0kYk,k dk Hkkj$}{$foy; dk v.kHkkj$}$

;k ¾ $\frac{$foy; dk Hkkj$}{$foy; dk v.kHkkj$} \times \frac{1000}{$f0kYkk,kd dk XkkEkk Ek Hkkj$}$

ekyyrk ¾ $\frac{w \times 1000}{w \times m}$

m = f0kYk,k dk v.kHkkj

LkEkhdj.k (i) Ek EkkYkYkRkk m dk EkkUk j[kUk Ikj]

$$\Delta Tf = Kf \times \frac{w \times 100}{w \times m}$$

vFk0kk $$m = \frac{1000Kfw}{\Delta Tfw}$$ IkR,kd Lkgh Ikj 1]1]1 vd

bLk Lk«k dh Lkgk,kRkk Lk ΔTf KkRk gkUk Ikj v0kk"Ik'khYk Iknkfk dk v.kHkkj m KkRk dj Lkdrk gA

mRRkj 12 fl) djuk g &$\Delta G = \Delta H - T\Delta S$

fdlh fudk; dh eDr Åtk] Åtk dh og ek=k g tk vf/kdre mi;kxh dk; e ifjofrr gkrh g eDr Åtk d eku dk fLFkj rki ,o nkc ij ifjdfyr djr g eDr Åtk dk fuEukulkj l ifjdfyr djr g&

$$G = H - TS \qquad .....(i)$$

pfd] $H = E + PV$

$$G = E + PV - TS$$

eDr Åtk voLFkk Qyu g vr%

$$\Delta G = \Delta E + \Delta(PV) - \Delta(TS)$$

$$\Delta G = \Delta E + P\Delta V + V\Delta P - T\Delta S - S\Delta T$$

eDr Åtk ifjoru d le; rki ,o nkc fLFkj gk rc

T =fLFkj] $S\Delta T = 0$

P =fLFkj] $V\Delta P = 0$

$$\Delta H = \Delta E + P\Delta V - T\Delta S$$

pfd $\Delta H = \Delta E + P\Delta V$] ΔH = ,UFkYih ifjoru

vr% $\Delta G = \Delta H + -T\Delta S$ bfr fl)e

bl gh fxC l gYegkYVt leh dj.k dgr gA

¼vFkok½

ΔG fdLkh jkLkk,kfUkd vfHkfØ,kk dh L0kRk% Ik0kfRkRkk dh EkRk g Å"EkkXkfRk d IkFkEk fUk,kEk Lk $\Delta E = q + w$

q = Rk«k }kjk v0k'kkf"kRk m"Ekk

ΔE = vkRkfjd ÅTkk Ikfj0kRkUk

w = Rk«k Ikj fd,kk Xk,kk dk,k gA

,kfn gEk fdLkh Rk«k }kjk fd,k Xk,k dk,k dh Xk.kUkk djUkh gk Rkk w d LFkkUk Ikj &w YkUkk IkMXkk vRkk% $\Delta E = q - w$

$q = \Delta E + w$

Rk«k }kjk fd,kk Xk,kk dk,k w IkLkkj dk,k vkj vIkLkkj dk,k nkUkk dk ,kkXk g A vIkLkkLkj dk,k d mIk,kkXk dk,k d :Ik Ek Ik,kDRk fd,kk Tkk Lkd Rkk gA mLk vnkCk vk,kRkUk dk,k mIk,kkXkh dk,k dgRk gA

vRkk% $q = \Delta E + w_{\exp} + w_{non\exp}$

Ikj Rk $w_{\exp} = p\Delta V$ ¼fLFkj nkCk Ikj½

$q = E + p\Delta V + w_{non\exp}$

fLFkj nkCk Ikj ,UFkYIkh Ikfj0kRkUk

$\Delta E + p\Delta V = \Delta H$

vRkk% $q = \Delta H + w_{non\exp}$

fLFkj RkkIk Ikj mRØEk.kh,k IkØEk d fYk,

$$\Delta S = \frac{q_{reu}}{T}$$

,kk $q_{reu} = T\Delta S$

RkCk $T\Delta S = \Delta H + w_{non\exp}$

$\Delta H - T\Delta S = -w_{non\exp}$

$\Delta H - T\Delta S = \Delta G$ ¼fLFkj RkkIk ,Ok nkCk Ikj ½

vRkk% $\Delta G = w_{non\exp}$

& $\Delta G = w_{non\exp}$

mRRkj 13

	HkkfRkd vf/k'kk"k.k &	jLkk,kfUkd vf/k'kk"k.k &
1-	bLkEk vf/k'kk"k.k vkj vfHk'kk"k.k d CkhPk d.Mj dYTk vkd"k.k nCkYk HkkfRkd CkYk YkXkRkk gA Tkk vR,kRk nCkYk CkYk gkRkk gA	bLkEk vf/k'kk"k.k vkj vfHk'kk"k.k d CkhPk jkLkk,kfUkd Ck/k CkUkRk g vkj mUkd CkhPk IkCkYk jkLkk,kfUkd CkYk YkXkRkk

gA

2- vf/k'kk"k.k m"Ekk dk EkkUk ¼20 l 40kj/mol^{-1}½ dEk gkRkk gA

3- ¸kg mRØEk.kh¸k gA

4- ¸kg RkR dkYk gkUk 0kkYkk lkØEk gA

2- vf/k'kk"k.k m"Ekk dk EkkUk ¼20 l 40kj/mol^{-1}½ vf/kd gkRkk gA

3- ¸kg vUkRØEk.kh¸k lkØEk gA

4- bLkdk 0kXk vf/k'kk"k.k ,0k vf/k'kk"k.k d L0kHkk0k lkj fUkHkj djRkk g Ekn ¸kk Rkh0k gk Lkd Rkk gA

¼vFko½

æ0k LUkgh dkYkk gMYk &

1- f0kYk¸k dk f0kYkk¸kd Ek ?kkYkUk lkj CkUkRkk gA

2- ¸k LFkk¸kh gkRk g bUkd LFkk¸khdj.k d fYk, LFkk¸khdkjd lknkFk fEkYkkUk dh vk0k'¸kd Rkk Ukgh gkRkh gA

3- bLkd LdUnUk d fYk, f0k|Rk vlk?kV; dh vf/kd Ekk«kk dh vk0k'¸kd Rkk gkRkh g

4- dkYkk bMYkh f0kYk¸kUkk d d.kk d LkkFk vf/kd Rkk Ek f0kYkk¸kd TkYk d d.k TkM jgRk gA

æ0k f0kjk/kh dkYkk bMYk &

1- bUkdk CkUkkUk d fYk, f0k'k"k f0kf/k¸kk vlkUkkUkh lkMRkh gA

2- bUkd CkUkkRk LkEk¸k bUkEk LFkk¸khdkjd lknkFk fEkYkk¸kk TkkRkk gA ¸k vR¸kRk vLFkk¸kh gkRk gA

3- f0k|Rk vlk?kVî dh vR¸kRk dEk Ekk«kk Hkh bUg LlkfnRk dj nRkh gA

4- bUk dkYkk bMh f0kYk¸kUkk d d.k d LkkFk f0kYkk¸kd d d.k TkM Ukgh gkRk gA

mÙkj 14- 1- lkkVf'k¸kEk gDLkk Lkk¸kukQjV II

2- gDLkk ,EkhUk dkCkkYV III ¶ykjkbM

3- DYkkjkbM 3- lkkVf'k¸kEk VVk vk¸kkMkEkjD¸kjV II

4- VVk ,EkhUk dklkj II LkYQV

¼vFko½

1- $K_3[Fe(CN)_6]^{III}$

2 $K[Ag(CN)_2]^{II}$

3 $[Ni(CN)_4]$

4 $[Ni(CO)_4]$

mRRkj 15- (1) $Ag|Ag^+(aq)1M||Cu^{2+}(aq)1M|Cu$

$E^o = E_{cu^{+2}/cu} - E_{Ag+/Ag}$ ¼1 HkkXk Ikj 2 vd ½

$E^o = 0.34 - (-0.80)$ ¼2 j HkkXk Ikj 3 vd ½

$E^o = 1.14V$

dFkkM – Ag ,UkkM – Cu

¼2½

XkYokUkh LkYk &	f0k|Rk vIk?kVUkh LkYk
1- bLkEk jLkk,kfUkd ÅTkk dk f0k|Rk Ek Ikfj0kRkUk gkRkk gA	1- bLkEk f0k|Rk ÅTkk dk jkLkk,kfUkd ÅTkk Ek Ikfj0kRkUk gkRkk gA
2- bLkEk Cathode (+) RkFkk Anode (–) /k0k gkRkk g	2- bLkEk Cathode (–) RkFkk Anode (+) /k0k gkRkk g
3- bLkEk nkUkk electrodes vYkXk& vYkXk f0kYk,kUk Ek MCk jgRk g mnkgj.k&MfUk,kYk LkYk	3- bLkEk nkUkk electrodes ,d gh f0kYk,kUk Ek MCk jgRk gA mnkgj.k &UkYLkUk LkYk

¼vFkok½

(1) $Zn(s)|Zn^{++}(aq).5||Ag^+(aq)10M|Ag(s)$

dk 298K ij EMF dh x.kuk

($E^oAg = 0.789$, $E^oZn = -0.760$)

gy & ly foHko dk lehdj.k&

$$E_{cell} = E^o_{RHS} - E^o_{LHS} + \frac{2.303RT}{2F}\log 10\frac{[Ag^+(aq)]}{[Zn^{++}(aq)]}$$

$$E_{cell} = [0.798-(-0.760)] + 2\times\frac{2.303RT}{2F} + \log_{10}\frac{[10]}{[0.5]}$$

$E_{cell} = 1.558 + 0.059 \log_{10}20$

$E_{cell} = 1.558 + 0.059 \times 1.3010$

$E_{cell} = 1.634V$

½2½ ikFkfed ly ,oa f}rh;d ly esa nks vrj

ikFkfed LkYk &	f}rh;d ly
1- ikFkfed ly ,d ckj mi;kx d ckn iwjh vkof'kr ugh fd;k tk ldrk gA	1- f}rh;d ly dk mi;kx d ckn iwjh vkof'kr fd;k tk ldrk gA
2- jklk;fud vfHkfØ;k doy ,d fn'kk esa gkrh gA	2- jklk;fud vfHkfØ;k nksuksa fn'kkvksa esa gkrh gA

mÙkj 16- IkFkEk dkfV dh vfHkfØ;kk d fYk;k nj fLFkjkd dk fUk/kkj.k ¼LkEkkdYkUk dh f0kf/k }kjk½

,d LkkEkkU;k vfHkfØ;kk lkj f0kPkkj djUk lkj

A $\rightarrow$ fØ;kk QYk

A $a_{gm\ M/L}$

;fn t = T, rc

$(a-x)_{gm\ M/L}$

æ0;kkUkIkkRkh fØ;kk d fUk;kEkkUkLkkj

^vfHkdkjd dh vfHkfØ;kk dh XkfRk mLkd LkfØ;k Ekk«kk d LkEkkUkIkkRkh gkRkk gA**

vRk% $\frac{dx}{dt} \propto (a-x)$ .....(i)

$\frac{dx}{dt} = K(a-x)$ .....(ii)

Ik{kkRkj djUk lkj

$\frac{dx}{(a-x)} = Kdt$ .....(iii)

LkEkkdYkUk djUk lkj

$\int_{x_2}^{x_1} \frac{dx}{(a-x)} = K\int_2^1 dt$ .....(iv)

$ln(a-x) = Kt + I_0$ .....(v)

¸kfn $x = 0, t = 0$ .....(vi)

LkEkh dj.k (v) Ek Lk (vi) l I_0 dk EkkUk j[kUk Ikj

$$-ln(a - x) = Kt + (-lna)$$

$$\frac{lna}{ln(a-x)} = Kt$$

Ik{kkRkj djUk Ikj

UkPkj Yk YkkXk dk LkkEkkU¸k YkkXk Ek Ikfj0kRkUk Lk

$$K = \frac{1}{t} ln \frac{a}{(a-x)} = \frac{2.303}{t} \log \frac{a}{(a-x)}$$

¼vFkZokk½

mÙkj 16 'kU¸k dkfV dh vfHkfØ¸kk d fYk, vfHkfØ¸kk dh nj vfHkdkjdk d Lkkæ.k d 'kU¸k ?kkRk d LkEkkUkIkkRkh gkRk gA

vfHkfØ¸kk R $\rightarrow$ Prodc. Ek

nj = $\frac{-d[R]}{dt} = k[R]^o$ ....(i)

nj = $\frac{-d[R]}{dt} = k \times 1$ D¸kkfd $[R^o] = 1$

$$d[R] = -kdt \quad ....(ii)$$

nkUkk vkj dk LkEkkdYkUk djUk Ikj

$$[R] = -kt + 1 \quad ....(iii)$$

tc $t = 0$ g RkCk $[R] = [R]_0$ ¼R_0 vfHkdkjd dk Ikkjfhkd Lkkæ.k½

; EkkUk LkEkh dj.k (iii) Ek j[kUk Ikj

$$[R]_0 = k \times 0 + 1 \quad ....(iv)$$

$$I = [R]_0 \quad ....(v)$$

LkEkh dj.k (iii) vkj (v Lk

$$[R] = -kt + [R]_0 \quad ....(vi)$$

$$K = \frac{[R]_0 - [R]}{t}$$

mRrj 17 **QkVkXkkQh d Ikn &**

1- **mnHkkLkUk &** dEkj d YkLk dk 0kLRk Ikj dfæRk dj dN Lkd.M d fYk, Ikdk'k MkYkRk g bLk mnHkkLkUk dkYk dgRk gA bLkLk 0kLRk dk fPk«k IYkV Ikj vk TkkRkk gA

$$2AgBr \rightarrow Ag_2Br + Br$$

2- **M0kYkfIkXk djUkk &** fD0kUkkYk] Ikkbjk XkYkkYk gkbMkfD0kUkkUk ¸kk fEkMkYk dk {kkjh¸k ?kkYk M0kYk Ikj gkRkk g Tkk fd $AgBr$ d Ag Ek vIkPk¸kUk dk Ik.k dj nRkk g bLkLk fUkXkfV0k IkkIRk gkRkk gA

$$C_6H_4(OH)_2 + 2AgBr \rightarrow C_6H_4(OH)_2 + 2Ag\downarrow + 2HBr$$

3- **fLFkjhdj.k &** LkkfM¸kEk Fkk¸kkLkYQV ¼gkbIkk f0kYk¸kUk dk mIk¸kkXk fUkXkfV0k d fLFkjhdj.k gRk fd¸kk TkkRkk g vIk¸kDRk $AgBr$ gkbIkk Ek ?kYkdj vYkXk gk TkkRkk g½

$$AgBrNa_2S_2O_3 \rightarrow Na[AgS_2O_3] + NaBr$$

4- fIkfVXk & fIkfVXk IkIkj Ikjf UkXkfV0k d }kjk Ikdk'k MkYkdj dN LkEk¸k d fYk, j[kk TkkRkk g fTkLkLk IkIkj Ikj 0kLRk dh Lkgh fPk«k vfdRk gk TkkRkk g fIkfVXk IkIkj Ikj $AgCl$ fTkYkVhUk dk YkIk gkRkk gA bLk /kkdj Lk[kk YkRk gA

5- VkfUkXk ¸kk jXk LkLkdj.k & dkYk LkQn fPk«k dk PkEkdhYkk CkUkkUk gRk $AgCl_3$ dk f0kYk¸kUk mIk¸kkXk fd¸kk TkkRkk g fTkLk VkfUkXk dgRk gA

$$AuCl_3 + 3Ag \rightarrow 3AgCl + Au$$

¼vFkok½

1- v;Ld dk l= ¼& dkIkj Ikkbjk bVhTk $Cu_2S.Fe_2S_3$ ¸kk $CuFeS_2$ 1 vd

2- v¸kLd dk Lkkæ.k ¼& dkIkj d LkYQkbM v¸kLd dk Lkkæ.k QUk mRIYkk0kUk f0kf/k Lk fd¸kk TkkRkk gA IkhLk g, v¸kLd $CuFeS_2$ dk IkkUkh Lk Hkj gkTk Ek MkYk fn¸kk TkkRkk g] RkRIkÜPkkRk PkhM ¸kk ¸kdkfYkIVLk dk RkYk MkYkdj 0kk¸k dh RkYk /kkjk Ik0kkfgRk djUk Ikj v¸kLd ÖkkXk d ÅIkj RkjRkk gA fTkLk vYkXk dj fYk¸kk TkkRkk g vkj v'kf)¸kk UkhPk CkB TkkRkh g] bUkdk vYkXk dj fYk¸kk TkkRkk gA 1 vd

3- HkTkUk ¼& $2CuFeS_2 + O_2 \rightarrow Cu_2S + 2FeS + SO_2$

$$2FeS + 3O_2 \rightarrow 2FeO + 2SO_2$$

$$Cu_2S + 3O_2 \rightarrow 2Cu_2O + 2SO_2$$

IkXkYkUk %& $Cu_2O + FeS \rightarrow Cu_2S + FeO$ 1½ vd

$$FeO + SiO_2 \rightarrow FeSiO_3$$

4- EkV d ?kVd D;kIkLk LkYQkbM RkFkk QjLk LkYQkbM gA 1 vd]

$(Cu_2S + FeS)$

5- 'kk/kUk Ek Ik;kDRk ,d f0kf/k f0k|Rk vIk?kVUk gA vFk0kk vU;k LkEkd{k f0kf/k dk UkkEk ½ vd

mÙkj 18 vkLVokYM f0kf/k Lk Ukkbfvd vEYk d fUkEkk.k dk fLk)kRk

1 vk;kRkUk vEkkfUk;kk vkj 8 vk;kRkUk 0kk;k dk fEkJ.k Pt dh TkkYkh d Åkj 800 808°C RkkIk Ikj Ik0kkfgRk fd;kk TkkRkk g Rkk 90 IkfRk'kRk vEkkfUk;kk dk Ukkbfvd vkDLkkbM Ek vkDLkh dj.k gk TkkRkk gA

$$4NH_3 + 5O_2 \rightarrow 4NO + 6H_2O$$

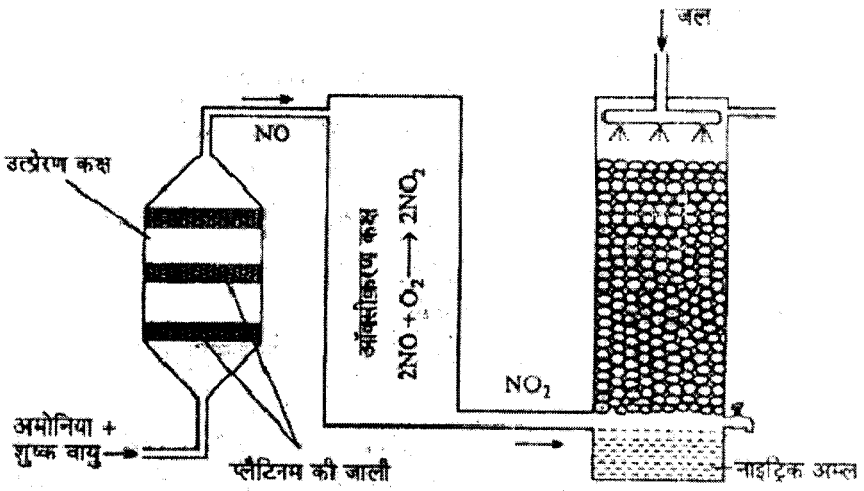
TkYk fEkYkkUk Ikj Ukkbfvd vEYk CkUkRkh gA

$$2NO + O_2 \rightarrow 2NO_2$$

$$2NO_3 + H_2O \rightarrow HNO_2 + HNO_3$$

$$3HNO_2 \rightarrow HNO_3 + H_2O + 2NO$$

UkkEkkfdRk fPk«k %&



¼vFk0kk½

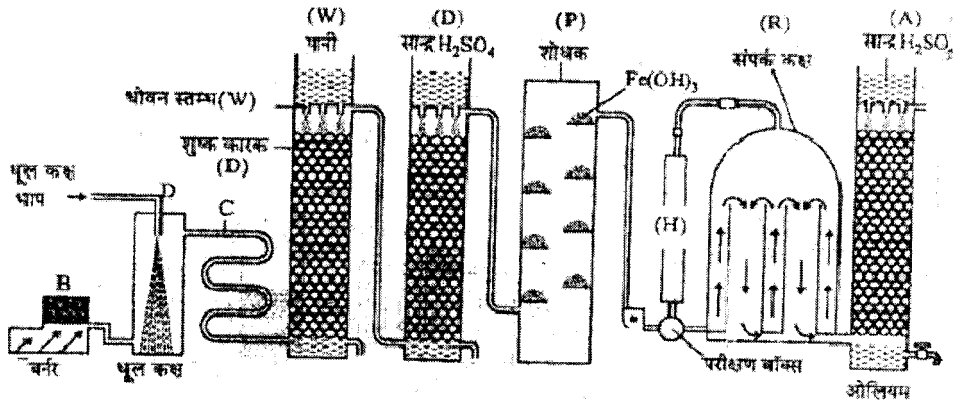
H_2SO_4 d LkIkd d{k f0kf/k dk fLk)kRk &

'k) ,0k 'k"d SO_2 RkFkk 0kk,k d fEkJ.k dk mRIkjd V_2O_5 Ikj Ik0kkfgRk djUk Lk 0kg SO_3 Ek vkDLkhÑRk gk TkkRkk g Tkk TkYk Lk fØ,kk djd H_2SO_4 CkUkkRkk g

$$2SO_2 + O_2 \rightarrow 2SO3 + 45.2\ Kcal$$

$$SO_3 + H_2O \rightarrow H2SO_4$$

UkkEkkfdRk j[kkfPk«k



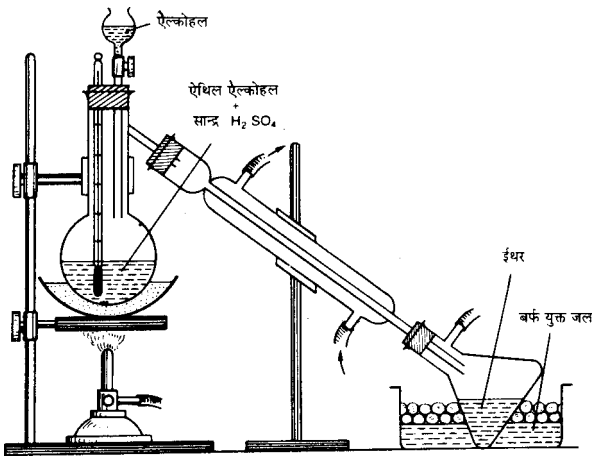
mÙkj 19- ¼1½ Ik,kkXk'kkYkk Ek Mkb,fFkYk bFkj CkUkkUk dh f0kf/k dk jkLkk,kfUkd lehdj.k

$$C_2H_5OH + H_2SO_4 \xrightarrow{110^\circ} C_2H_5HSO_4 + H_2O$$

,fFkYk vYdkgYk

$$C_2H_5HSO_4 + HOC_2H_5 \xrightarrow{140^\circ} C_2H_5OC_2H_5 + H_2SO_4$$

¼2½ UkkEkkfdRk fPk«k &



¼3½ f0kf/k dk Lkf{kIRk 0k.kUk & vkLk0kUk ¶YkkLd Ek 100ml Ikfj'k) C_2H_5OH ,0k 50ml Lkkæ H_2SO_4 Ykdj CkkYk Å"Ekd Ikj XkjEk djRk g RkkIk 140°C Ikj j[kk

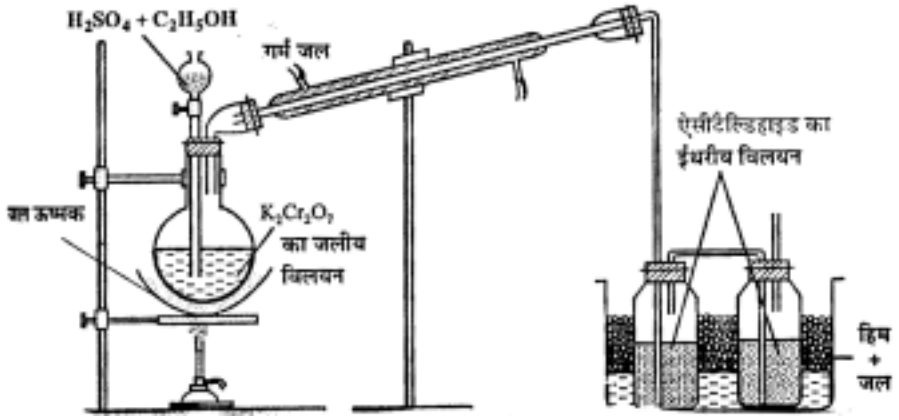
TkkRkk g A CkQ fEkYk TkYk Lk j[k g, Xkkgh ¶YkkLd Ek bFkj ,d«k dj fYk,kk TkkRkk gA

¼vFkZkkk½

¼1½ ,fLkVfYMgkbM fUkEkk.k d fYk, jkLkk,kfUkd LkEkhdj.k%&

$$CH_3CH_3OH + [O] \xrightarrow{K_2Cr_2O_7} CH_3OH + H_2O$$,fLkVfYkgkbM

¼2½ UkkEkkfdRk fPk«k &



¼3½ fof/k dk lf{kIr o.ku %&

25gm $K_2Cr_2O_7$ dk 100ml TkYk Ek ?kkYkdj ,d XkkYk Iknh d ¶YkkLd Ek YkRk gA fCkndkjh dhIk Ek 35ml, C_2H_5OH RkFkk 20ml cmc H_2SO_4 dk fEkJ.k Ykdj ¶YkkLd dk TkYk m"Ekd Ikj FkkMk XkEk djRk gA CkUkh Okk"Ik Lk?kfj«k ¼XkEk½ Lk XkTkjRkh g CH_3CHO dh Okk"Ik BM dkUkhdYk ¶YkkLd Ek Lk?kfj«k gkdj bFkjh,k fOkYk,kUk CkUkk YkRkh g bLk RkUk H_2SO_4 d LkkFk vkLkfOkRk djUk Lk 'k) ,LkhVfYMgkbM IkkIRk gkRkk gA ¼2]2]2 vd½

Set - C

gkbLdy lVhfQdV ijh{kk

High School Certificate Examination

lEiy&i'u i=

SAMPLE PAPER

fo"k; %& (Subject) - jlk;u **le; 3 ?k.Vk (Time- 3 Hrs)**

d{kk %& (Class) - 12oh **i.kZd 75 (M.M.)**

(Instruction) & ¼fun'kZ½

1- lHkh i'u gy djuk vfuok;Z g A

Attempt all the Question

2- i'u Øekd 01 e 10 vad fu/kkfjr g A nk dky[k.M g A [k.M ^^v** e 05 cgfodYih; i'u rFkk [k.M ^^c** e 05 fjDr LFkkuk dh ifr vFkok mfpr lc/k tkfM, A iR;d i'u d fy, 1 vad vkcfVr g A

Q. No. 01 Carries 10 Marks. There are two sub-section, Section A is Multiple choice carries 05 marks and section B is fill in the blanks or match the column carries 05 marks.

3- i'u Øekd 02 l i'u Øekd 06 rd vfr y?kqRrjh; i'u g A iR;d i'u ij 02 vad vkcfVr g A mRrj dh vf/kdre 'kCn lhek 30 'kCn A

Q. No. 2 to 06 are very short answer type question & it carries 02 marks each. Word limit is maximum 30.

4- i'u Øekd 07 l i'u Øekd 10 rd y?kqRrjh; i'u g A iR;d i'u ij 03 vad vkcfVr g A mRrj dh vf/kdre 'kCn lhek 50 'kCn A

Q. No. 07 to 10 are short answer type question & it carries 03 marks each. Word limit is maximum 50.

5- i'u Øekd 11 l i'u Øekd 14 rd y?kqRrjh; i'u g A iR;d i'u e vkrfjd fodYi g vkj iR;d i'u ij 04 vad vkcfVr g A mRrj dh vf/kdre 'kCn lhek 75 'kCn A

Q. No. 11 to 14 are short answer type question & it carries 04 marks each. Each question has internal choice. Word limit is maximum 75.

6- i'u Øekd 18 l i'u Øekd 19 rd nh?kmRrjh; i'u g A iR;d i'u e vkrfjd fodYi g vkj iR;d i'u ij 06 vd vkcfVr g A mRrj dh vf/kdre 'kCn lhek 150 'kCn A

Q. No. 18 to 19 are long answer type question & it carries 05 marks each. Each question has internal choice. Word limit is maximum 150.

Ik'Uk 1- ¼v½ Ckgf0kdYIkh¸k Ik'Uk &

1- fUkEUk Ek dku vUkPkCkdh¸k O¸k0kgkj Iknf'kRk djRkk g&

¼v½ C_2 ¼c½ O_2^{--}

¼l½ $O2^{++}$ ¼n½ O_2^{-}

2- fUkEUkfYkf[kRk Ek Lk dkUk LkgLk¸kkTkd BkLk Ek TkkYkd fCkn gkRkk g&

¼v½ v.k ¼c½ /kUkk¸kUk

¼l½ _.kk¸kUk ¼n½ IkjEkk.k A

3- fdLkdk TkYkh¸k f0kYk¸kUk {kkjh¸k gkRkk g&

¼v½ HOCl ¼c½ $NaHSO_4$

¼l½ NH_4NO_3 ¼n½ NaOCl

4- vEkkfUk¸ke vk¸kUk g&

¼v½ Uk vEYk Uk {kkj ¼c½ vEYk {kkj nkUkk

¼l½ ,d Lk¸kXEkh vEYk ¼n½ ,d Lk¸kXEkh {kkj A

5- 'kh?kRkk Lk vIkPkf¸kRk gkUk 0kkYkk gYkkTkUk g&

¼v½ ¶Ykkfjk Uk ¼c½ DYkkjhUk

¼l½ CkkEkhUk ¼n½ vk¸kkfMUk A

Que 1 (A) Multiple choice question

1. Which one of the following shows the paramagnetic behavior -

(a) C_2 (b) O_2^{--}

(c) $O2^{++}$ (d) O_2^{-}

2. Which one of the following isolattice point in co-valent solid -

(a) Molecule (b) Anion

(c) Cataion (d) Atom

3. Which aquous solution in basic in nature -

(a) HOCl (b) $NaHSO_4$

(c) NH_4NO_3 (d) NaOCl

4. Amonium ion is -

(a) Neither acid nor base (b) acid and base both

(c) a conjugate acid (d) a conjugate base

5. Halogen which reduces immediatly is -

(a) Fluorine (b) chlorine

(c) Bromine (d) Iodine

¼Ck½ fjDRk LFkkUkk dh IkfRk dhfTk, &

1- DYkkjhUk dh fCkjTkUk fØ,kk d fYk, &&&&&mÙkjnk,kh gA

2- dfYLk,kEk ,LkhVV d ,d v.k dk XkEk djUk Ikj &&&&IkkIRk gkRkk gA

3- DYkkjYk dk Lk«k &&&&&gA

4- dkYkRkkj d IkHkkTkh vkLkOkUk Lk IkkIRk Ek/,k RkYk Ek &&&&mIkfLFkRk gkRkk gA

5- ekuo jDr dk pH eku &&&& gA

(B) Fill in the blanks -

1. ..... is responsible for bleaching action of chlorine.

2. On heating one molecule of calcium acetate ..... is obtained.

3. Formula of chloral is .....

4. ..... is present in the middle oil obtained from fractional distillation of coaltar.

5. pH value of human blood is .....

Ik'Uk 2- Ckkjk Vkb¶Ykkjkb M YkbLk vEYk gA D,kk\

Boron trifluoride is a Lewis acid. Why?

Ik'Uk 3- jfM,kk ,fDVOkRkk dh ,Lk-vkb- bdkb D,kk g\

What is S.I. unit of radio activity?

Ik'Uk 4- ¶Ykkjhuk d vLkXkRk O,kOkgkj dk LIk"V dhfTk, \

Explain the Anomalous behaviour of fluorine.

Ik'Uk 5- fEkjCkUk dk RkYk fdLk dgRk g\ bLkdk Lk«k fYkf[k,\

What is oil of mirbane? Write its formula.

Ik'Uk 6- CkgYkh dj.k dk Ikfjhkkf"kRk dhfTk,\

Define polymerisation.

Ik'Uk 7- ,kfUkV LkYk dh Ikfjhkk"kk fYkf[k, A ?kUkh,k ,kfUkV LkYk d ?kUkROk d fYk, Lk«k

fYkf[k, \

Define unit cell. Write the formula for density of cubic unit cell.

Ik'Uk 8- vkDLkhTkUk v.k dk vkf.Okd d{kd ÅTkk LRkj vkj[k CkUkkdj LIk"V dhfTk, fd vkDLkkhTkUk v.k vUkPkCkdh¸k gkRkk gA

Draw the molecular orbital diagram of oxygen molecule and explain that its molecule is paramagnetiec in nature.

Ik'Uk 9- IkkFkfEkd] f}Rkh¸kd ,Ok RkRkh¸k ,EkhUk Ek dkb 3 vRkj fYkf[k, \

Write any three differences among primary, secondary and tertiary amines.

Ik'Uk 10- UkkHkdh¸k fOkdj.k d Tkf0kd [kRkj Lk CkPkkOk LkÖkkOk bLk Ikdkj nhfTk, fd LkRkRk f0kdkLk IkHkkf0kRk Uk gkA

For the protection of Hazards of nuclear radiation wirte the suggestion so that the continuing development should not be affected.

Ik'Uk 11- D0kFkUkkd Ek mUUk¸kUk d vk/kkj Ikj v0kk"Ik'khYk f0kYk¸k IknkFk dk v.kHkkj KkRk dhfTk,A

Determine the molecular mass of a non volatile solute with teh help of elevation of boiling point.

¼vFkOkk½

fgEkkd Ek v0kUkEkUk d vk/kkj Ikj v0kk"Ik'khYk f0kYk¸k IknkFk dk v.kHkkj KkRk dhfTk,A

Determine the moleculr mass of non volatile solute with the help of depression in freezing point.

Ik'Uk 12- fLk) dhfTk, fd $\Delta G = \Delta H - T\Delta S$

Prove that $\Delta G = \Delta H - T\Delta S$

¼vFkOkk½

fLk) dhfTk, fd $-\Delta G = W_{non-\exp ansion}$

Prove that $-\Delta G = W_{non-\exp ansion}$

Ik'Uk 13- HkkfRkd ,Ok jkLkk¸kfUkd vf/k'kk"k.k Ek Pkkj vRkj fYkf[k, \

Write any four differences betwen physical adsorption and chemical

adsorption.

¼vFkOkk½

æ0k LUkgh dkYkkbM ,0k æ0k f0kjk/kh dkYkkbM Ek Pkkj vRkj fYkf[k,\

Write any four differences between Lyophilic and Lyophobic colloids.

Ik'Uk 14- fUkEUk ;kfxdk d vkb-,k-Ikh-,-Lkh- UkkEk fYkf[k,

Write the I.U.P.A.C. name of the following compounds.

¼1½ $K_4[Fe(CN)_6]$

¼2½ $[Co(NH_3)_6]Cl_3$

¼3½ $K_2[HgI_4]$

¼4½ $[Cu(NH_3)_4]SO_4$

¼vFkOkk½

fUkEUkfYkf[kRk d Lkj PkUkk Lk«k fYkf[k, &

1- IkkVf'k,kEk Qjh (III) Lkk,kUkkbM

2- IkkVf'k,kEk Mkb Lkk,kUkk vTkUVV (I)

3- VV Lkk,kUkk fUkfdYkV (II) vk,kUk

4- VVk dkCkkfUkYk fUkfdYk (O)A

Write the structural formulae of the following compounts -

1. Pot. ferr. (III) cyanide
2. Pot. Di cyano argentate (I)
3. Tetra Cyano Nickelate (II) ion
4. Tetra carbonyl Nickle (O)

Ik'Uk 15¼1½ UkhPk fn,k Xk, LkYk d E^o Xk.kUkk dhfTk, &

$E^o_{Ag^+/Ag}$ = (+) 0.80V, $E^o_{Cu^{+2}/Cu}$ = +0.34V gA

¼2½ XkY0kUkh LkYk 0k f0k|Rk vIk?kVUkh LkYk Ek dkb nk vRkj fYkf[k,A

(1) Calculate the E^o of the following cell -

$E^o_{Ag^+/Ag}$ = (+) 0.80V, $E^o_{Cu^{+2}/Cu}$ = +0.34V

(2) Write any two differences between Galvanic cell and Electrolytic cell.

¼vFkOkk½

¼1½ LkYk Zn(s) | Zn++ (aq.) || Ag+(aq.) (1.0)M | Ag(s) (1.0M) dk 298K Ikj EMF KkRk djk A ($E^{o}_{Ag^{+}/Ag}$ = 0.789V, $E^{o}_{Zn^{2+}/Zn^{-}}$ = –0.76V)

¼2½ IkkFkfEkd LkYk ,0k f}Rkh¸kd LkYk Ek nk vRkj fYkf[k, \

(1) Calculate the EMF of the following cell at Zn(s) | Zn++ (aq.) || Ag+(aq.) 10M | Ag(s) (1.0M) [Give that $E^{o}_{Ag^{+}/Ag}$ = 0.789V, $E^{o}_{Zn^{2+}/Zn^{-}}$ = –0.76V]

(2) Write any two differences between primary and secondary cell.

Ik'Uk 16- IkFkEk dkfV dh vfHkfØ¸kk d fYk, nj fLFkjkd dh Xk.kUkk LkEkkdYkUk f0kf/k Lk dhfTk, A

Calculate the rate constant of first order reaction from integrated method.

¼vFkOkk½

'kU¸k dkfV dh vfHkfØ¸kk d fYk, nj fLFkjkd dh Xk.kUkk LkEkkdYkUk f0kf/k Lk dhfTk, \

Calcualte the rate constant of zero order reaction from integrated method.

Ik'Uk 17- QkVkXkkQh d fUkEUk Iknk dk LkEkÖkkb¸k&

1- mnHkkLkUk

2- M0kYkfIkXk

3- fLFkjhdj.k

4- fIkfVXk

5- VkfUkXk ¸kk jXk LkLdj.k

Explain photography on following points -

(i) Exposure

(ii) Developing

(iii) Fixation

(iv) Printing

(v) Toning

¼vFkOkk½

dkIkj Ikk¸kjkbVhTk Lk RkkCkk d fUk"d"k.k d fUkEUk Iknk dk LkEkÖkkb¸k\

1- v¸kLd dk Lk«k

2- v¸kLd dk Lkkæ.k

3- HkTkUk ,Ok IkXkYkUk Iknk Ek Ik¸kDRk jkLkk¸kfUkd vfHkfØ¸kk

4- EkV d ?kVd

5- 'kk/kUk Ek Ik¸kDRk ,d f0kf/k dk UkkEk A

Explain the extraction of copper from copper pyrites in the following points -

(i) Formula of ore

(ii) Concentraction of ore

(iii) main reactions in roasting

(iv) component of matte

(v) name of one method involved in purification method.

Ik'Uk 18- vkLV0kkYM f0kf/k Lk Ukkbfvd vEYk d fUkEkk.k dk fUkEUk fCknvk d vk/kkj Ikj fYkf[k,&

1- fLk)kRk

2- UkkEkkfdRk fPk«k

3- Ik¸kDRk jkLkk¸kfUkd vfHkfØ¸kk,

Explain the manufacture of nitric acid from Ostwald method in the following points -

(i) Principle

(ii) Labelled diagrame

(iii) chemical reaction used in the process.

¼vFk0kk½

LkY¶¸kfjd vEYk d fUkEkk.k dh LkIkd f0kf/k dk 0k.kUk fUkEUk fCknvk d vk/kkj Ikj dhfTk, &

1- fLk)kRk

2- UkkEkkfdRk fPk«k

3- Ik¸kDRk jkLkk¸kfUkd vfHkfØ¸kk,A

Explain the manufacture of Sulphuric acid from contact proces in the

following points -

(i) Principle

(ii) Labelled diagrame

(iii) Chemical reactions used in the process.

Ik'Uk 19- Ik,kkXk'kkYkk Ek Mkb,fFkYk bFkj d fUkEkk.k dk fUkEUk fCknvk d vk/kkj Ikj fYkf[k,&

1- jkLkk,kfUkd LkEkhdj.k

2- UkkEkkfdRk fPk«k

3- f0kf/k dk Lkf{kIRk 0k.kUk

Explain the Lab. method preparation diethyl ethes in the following points-

(i) Chemical equation

(ii) Labelled diagrame

(iii) Method in brief.

¼vFk0kk½

Ik,kkXk'kkYkk Ek ,fLkVfYMgkbM dk fUkEkk.k fUkEUk fCknvk d vURkXkRk dhfTk, &

1- jkLkk,kfUkd LkEkhdj.k

2- UkkEkkfdRk fPk«k

3- f0kf/k dk Lkf{kIRk 0k.kUk A

Explain the Lab method preparation of CH_3CHO in the following points-

(i) Chemical equation

(ii) Labelled diagrame

(iii) Method in brief.

mÙkjEkkYkk LkV&Lkh

mÙkj 1¼v½ 0kLRkfUk"B

1- ¼c½

2- ¼n½

3 ¼n½

4 ¼l½

5 ¼n½

¼Ck½ fjDRk LFkkUk Hkjk &

1 UkOkTkkRk DYkkjhUk

2 ,LkhVku $(CH_3.CO.CH_3)$

3 CCl_3CHO

4 Uk¶FkYkhUk

5 7- 34

mÙkj 4 ¶YkkfjUk d vLkXkRk 0¸kOkgkj dk dkj.k&

1- vfr mPp fo|r _.krk

2- lkjEkk.k vkdkj NkVk

3- mPPk bYkDVkUk ?kUkROk

4- d&d{kdk dh vUkIkYkC/kRkk A dkb nk fCkn fYk[kUk lkj &02 vd A

mRRkj 5 fEkjCkUk dk RkYk & UkkbVkCkTkhUk

Lk«k & $C_6H_5NO_2$

Lkgh UkkEk fYk[kUk lkj & 01 vd Lkgh Lk«k fYk[kUk lkj &01 vd

mRRkj 6 CkgYkhdj.k dh lkfjHkk"kk& nk ¸kk nk Lk vf/kd lkdkj d EkkUkkEkj vkIkLk Ek Lk¸kkXk djd CkgYkd CkUkkRk g Rkk mLk Lkg CkgYkhdj.k dgRk gA

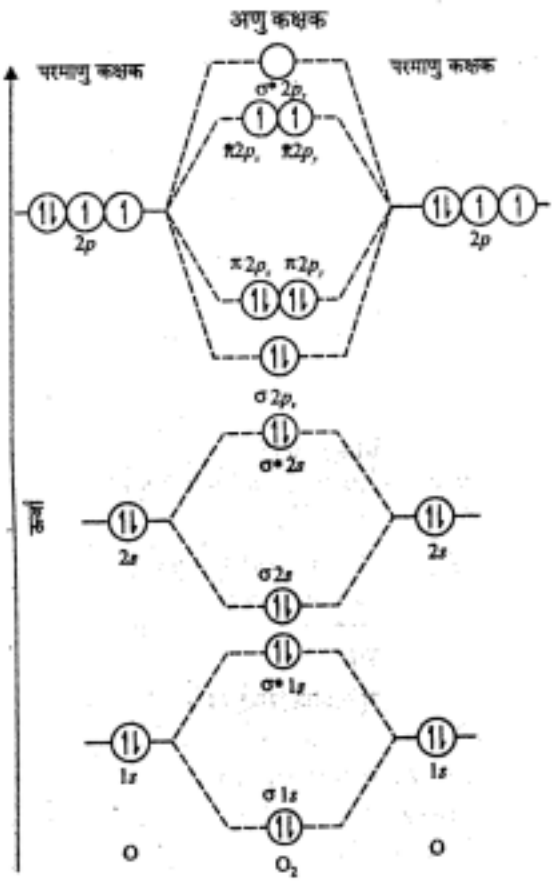
¼vU¸k LkEkd{k lkfjHkk"kk fYk[kUk lkj &02 vd½

mRRkj 7 ¸kfUkV LkYk & fdLkh fØLVYk tkYkd dk 0kg Lk{EkRkEk HkkXk CkgRk NkVh NkVh LkEkkUk bdkb¸kk fTkLkdh f«kf0kEk Ek CkkjCkkjRkk IkUkjkOkfÙk djUk lkj LkEIk.k fØLVYk PkkYk dk fUkEkk.k gk TkkRkk g mLk ¸kfUkV LkYk dgRk gA

¼vU¸k LkEkd{k lkfjHkk"kk fYk[kUk lkj &03 vd ½

mRRkj 8 vkDLkhTkUk v.k dk ÅTkk vkj[k

1- vkDLkhTkUk v.k & ,d vkDLkhTkUk Ikj Ekk.k Ek 8 bYkDVkUk gkRk g & $1s^2, 2s^2, 2p^4$ vRk% O_2 v.k Ek 16 bYkDVkUk gkXk vkj mLkdk vkf.0kd d{kd vkj[k n'kk,k vUkLkkj gkXkk A



2- PkECkdh,k IkÑfRk & vkDLkhTkUk v.k d vkf.0kd d{kdk Ek nk v,kfXEkRk bYkDVkUk gkUk Lk v.k vUkPkCkdh,k gkXkk A

¼Lkgh ÅTkk vkj[k Ikj &02 vd A Lkgh PkECkdh,k IkÑfRk fYk[kUk Ikj &01 vd½

mRRkj 9- ,0k dkb vRkj fYkf[k, &

Xk.k		IkkFkfEkd ,EkhUk	f}Rkh,kd ,EkhUk	RkRkh,kd ,EkhUk
1-	HNO_3 Lk fØ,kk	,Ydkgk CkUkkRkk g $+H_2$ XkLk	UkkbVkLkkEkhUk CkUkRkk g Tkk fQUkkYk $+H_2SO_4$ d LkkFk gjk jx	BM Ek UkkbVkbV CkUkkRkk g Tkk XkEk djUk Ikj UkkbVk& LkkEkhUk nRkk g
2-	dkfCkYk ,EkhUk	vfIk,k n/k,kDRk	dkb fØ;k ugh	dkb fØ;k ugh

dkfCkYk ,EkhUk djrk djrk

CkUkkRkk g

3- EkLVM vk,kYk ,fYdYk vkbLkk dkb fØ,kk Ukgh dkb fØ,kk UkghA

vfHkfØ,kk LkkbUkkbM

CkUkkRkk g fTkLkEk

LkjLkk d RkYk

TkLkk Xk/k gkRkk gA

mRRkj 10- UkkfHkdh,k f0kfdj.kk d Tkf0kd [kRkj&

UkkfHkdh,k ÅTkk d mIk,kkXk Lk mRIkUUk LkEkL,kk dk fYk[kUk Ikj 01 vd

LkRkRk f0kdkLk IkHkkf0kRk Uk gk bLk Ikj LkÖkk0k fYk[kUk Ikj 01 vd

mÙkj 11- fdLkh æ0k Ek v0kk"Ik'khYk f0kYk,k fEkYkkUk Ikj bLkdk 0kk"IknkCk dEk gkRkk g A bLk dkj.k f0kYk,kUk 'k) f0kYkk,kd Lk vf/kd RkkIkØEk Ikj mCkYkRkk gA

f0kYk,kUk RkFkk 'k) f0kYkk,kd d D0kFkUkkd Ek vRkj dk f0kYkk,kd d D0kFkUkkd Ek mUUk,kUk dgRk gA bLk ΔTb Lk n'kkRk gA

EkkUkk 'k) f0kYkk,kd dk D0kFkUkkd T_1 g RkFkk f0kYk,kUk dk D0kFkUkkd T_2 g A D0kFkUkkd Ek mUUk,kUk ΔTb ¾ $T_2 - T_1$ gkXkk A

fdLkh 0kk"Ik'khYk IknkFk dk TkYk Ek ?kkYkUk Ikj D0kFkUkkd Ek 0kf) æ0k d 0kk"IknkCk Ek v0kUkEkUk d LkEkkUkIkkRkh gkRkh gA

$$\Delta Tb \propto \Delta p$$

Ykfd Uk $\Delta p \propto m$ ¼EkkYkYkRkk½

$$\Delta p \propto \Delta Tb \propto m \quad \text{.....(i)}$$

$$\Delta Tb \propto m \quad \text{.....(ii)}$$

vFkkRk D0kFkUkkd Ek mUUk,kUk f0kYk,kUk dh EkkYkYkRkk d LkEkkUkIkkRkh gkRkk gA

,kfn w XkkEk f0kYkk,kd Ek w XkkEk f0kYk,k ?kYkk g

$$\therefore \quad 1000 \text{ xke foyk;d e } \frac{w \times 1000}{w} \text{ xke foy;}$$

$$\text{ekyyrk ¾ } \frac{w \times 1000}{w \times \text{foy; dk v.kHkkj}}$$

$$\Delta Tb \propto \frac{w \times 1000}{w \times m} \quad \text{.....(iii)}$$

LkEkh dj.k (ii) Ek EkkYkYkRkk m dk EkkUk j[kUk Ikj]

vFkkZkk $\Delta Tb = \frac{1000 \times K_b \times w}{mw}$ .....(iv)

$$m = \frac{1000 \times K_b \times w}{\Delta Tb.w} \quad \text{.....(v)}$$

bLk Lk«k Ek ?kfYkRk Iknkfk dk v.kHkkj KkRk dj YkRk gA

IkR,kd Lkgh Ikn Ikj 1]1]1 vd

¼vFkkZkk½

fdLkh f0kYk,kUk d fgEkkd dk v0kUkEkUk] f0kYk,kUk dh EkkYkYkRkk d LkEkkUkIkkRkh gkRkk gA

$$\Delta Tp \propto m$$

,kk $\Delta Tf = kf.m$ .....(i)

kf ¾ EkkYkYk fgEkkd v0kUkEkUk fLFkjkd]

;fn m ¾1 rk $\Delta Tf = kf$

vFkkr fdlh foy;u dk ekyd fgekd voueu fLFkjkd] f0kYkk,kd d fgEkkd Ek gb mLk dEkh d Ckjk Ckj g] Tkk ,d EkkYk v0kk"Ik'khYk f0kYk,k dk 100 XkkEk f0kYkk,kd Ek ?kkYkUk Ikj IkkIRk gkRkh gA

$\therefore$ 1000 xke foyk;d e $\frac{w \times 1000}{w}$ xke foy; gA

ekyyrk ¾ $\frac{\text{1000 XkkEk f0kYkk,kd Ek f0kYk,k dk Hkkj}}{\text{foy; dk v.kHkkj}}$

;k ¾ $\frac{\text{foy; dk Hkkj}}{\text{foy; dk v.kHkkj}} \times \frac{1000}{\text{f0kYkk,kd dk XkkEkk Ek Hkkj}}$

ekyyrk ¾ $\frac{w \times 1000}{w \times m}$

m = f0kYk,k dk v.kHkkj

LkEkh dj.k (i) Ek EkkYkYkRkk m dk EkkUk j[kUk Ikj]

$$\Delta Tf = Kf \times \frac{w \times 100}{w \times m}$$

vFkokk $m = \frac{1000 Kfw}{\Delta Tfw}$ lkR,kd Lkgh lkj 1]1]1 vd

bLk Lk«k dh Lkgk,kRkk Lk ΔTf KkRk gkUk lkj v0kk"Ik'khYk lknkFk dk v.kHkkj m KkRk dj Lkdrk gA

mRRkj 12 fl) djuk g &$\Delta G = \Delta H - T\Delta S$

fdlh fudk; dh eDr Åtk] Åtk dh og ek=k g tk vf/kdre mi;kxh dk; e ifjofrr gkrh g eDr Åtk d eku dk fLFkj rki ,o nkc ij ifjdfyr djr g eDr Åtk dk fuEukulkj l ifjdfyr djr g&

$$G = H - TS \qquad .....(i)$$

pfd] $H = E + PV$

$$G = E + PV - TS$$

eDr Åtk voLFkk Qyu g vr%

$$\Delta G = \Delta E + \Delta(PV) - \Delta(TS)$$

$$\Delta G = \Delta E + P\Delta V + V\Delta P - T\Delta S - S\Delta T$$

eDr Åtk ifjoru d le; rki ,o nkc fLFkj gk rc

T =fLFkj] $S\Delta T = 0$

P =fLFkj] $V\Delta P = 0$

$$\Delta H = \Delta E + P\Delta V - T\Delta S$$

pfd $\Delta H = \Delta E + P\Delta V$] ΔH = ,UFkYih ifjoru

vr% $\Delta G = \Delta H + -T\Delta S$ bfr fl)e

bl gh fxC l gYegkYVt lehdj.k dgr gA

¼vFkok½

ΔG fdLkh jkLkk,kfUkd vfHkfØ,kk dh L0kRk% Ik0kfRkRkk dh EkRk g Å"EkkXkfRk d lkFkEk fUk,kEk Lk $\Delta E = q + w$

q = Rk«k }kjk v0k'kkf"kRk m"Ekk

ΔE = vkRkfjd ÅTkk Ikfj0kRkUk

w = Rk«k lkj fd,kk Xk,kk dk,k gA

¸kfn gEk fdLkh Rk«k }kjk fd¸k Xk¸k dk¸k dh Xk.kUkk djUkh gk Rkk *w* d LFkkUk Ikj &*w* YkUkk IkMXkk vRkk

$$\Delta E = q - w$$

$$q = \Delta E + w$$

Rk«k }kjk fd¸kk Xk¸kk dk¸k *w* IkLkkj dk¸k vkj vIkLkkj dk¸k nkUkk dk ¸kkXk g A vIkLkkLkj dk¸k d mIk¸kkXk dk¸k d : Ik Ek Ik¸kDRk fd¸kk Tkk LkdRkk gA mLk vnkCk vk¸kRkUk dk¸k mIk¸kkXkh dk¸k dgRk gA

vRkk $q = \Delta E + w_{\exp} + w_{non\exp}$

Ikj Rk $w_{\exp} = p\Delta V$ ¼fLFkj nkCk Ikj½

$q = E + p\Delta V + w_{non\exp}$

fLFkj nkCk Ikj ,UFkYIkh Ikfj0kRkUk

$$\Delta E + p\Delta V = \Delta H$$

vRkk $q = \Delta H + w_{non\exp}$

fLFkj RkkIk Ikj mRØEk.kh¸k IkØEk d fYk,

$$\Delta S = \frac{q_{reu}}{T}$$

¸kk $q_{reu} = T\Delta S$

RkCk $T\Delta S = \Delta H + w_{non\exp}$

$\Delta H - T\Delta S = -w_{non\exp}$

$\Delta H - T\Delta S = \Delta G$ ¼fLFkj RkkIk ,Ok nkCk Ikj ½

vRkk $\Delta G = w_{non\exp}$

& $\Delta G = w_{non\exp}$

mRRkj 13	**Hkkfrd vf/k'kk"k.k &**	**jLkk¸kfUkd vf/k'kk"k.k &**
1-	bLkEk vf/k'kk"k.k vkj vfHk'kk"k.k d CkhPk d.Mj dYTk vkd"k.k nCkYk Hkkfrd CkYk YkXkRkk gA Tkk vR¸kRk nCkYk CkYk gkRkk gA	1- bLkEk vf/k'kk"k.k vkj vfHk'kk"k.k d CkhPk jkLkk¸kfUkd Ck/k CkUkRk g vkj mUkd CkhPk IkCkYk jkLkk¸kfUkd CkYk YkXkRkk gA
2-	vf/k'kk"k.k m"Ekk dk EkkUk ¼20 l	2- vf/k'kk"k.k m"Ekk dk EkkUk ¼20

40kj/mol^{-1}½dEk gkRkk gA

l 40kj/mol^{-1}½ vf/kd gkRkk gA

3- ¸kg mRØEk.kh¸k gA

3- ¸kg vUkRØEk.kh¸k lkØEk gA

4- ¸kg RkRdkYk gkUk 0kkYkk lkØEk gA

4- bLkdk 0kXk vf/k'kk"k.k ,Ok vf/k'kk"k.k d LOkHkk0k lkj fUkHkj djRkk g Ekn ¸kk Rkh0k gk Lkd Rkk gA

¼vFko½

æ0k LUkgh dkYkkgMYk &

1- f0kYk¸k dk f0kYkk¸kd Ek ?kkYkUk lkj CkUkRkk gA

2- ¸k LFkk¸kh gkRk g bUkd LFkk¸khdj.k d fYk, LFkk¸khdkjd lknkFk fEkYkkUk dh vk0k'¸kdRkk Ukgh gkRkh gA

3- bLkd LdUnUk d fYk, f0k|Rk vlk?kV; dh vf/kd Ekk«kk dh vk0k'¸kdRkk gkRkh g

4- dkYkkbMYkh f0kYk¸kUkk d d.kk d LkkFk vf/kdRkk Ek f0kYkk¸kd TkYk d d.k TkM jgRk gA

æ0k f0kjk/kh dkYkkbMYk &

1- bUkdk CkUkkUk d fYk, f0k'k"k f0kf/k¸kk vlkUkkUkh lkMRkh gA

2- bUkd CkUkkRk LkEk¸k bUkEk LFkk¸khdkjd lknkFk fEkYkk¸kk TkkRkk gA ¸k vR¸kRk vLFkk¸kh gkRk gA

3- f0k|Rk vlk?kVî dh vR¸kRk dEk Ekk«kk Hkh bUg Llkfn Rk dj nRkh gA

4- bUk dkYkkbMh f0kYk¸kUkk d d.k d LkkFk f0kYkk¸kd d d.k TkM Ukgh gkRk gA

mÙkj 14- 1- lkkVf'k¸kEk gDLkk Lkk¸kukQjV II

2- gDLkk ,EkhUk dkCkkYV III ¶ykjkbM

3- DYkkjkbM 3- lkkVf'k¸kEk VVk vk¸kkMkEkjD¸kjV II

4- VVk ,EkhUk dklkj II LkYQV

¼vFko½

1- $K_3[Fe(CN)_6]^{III}$

2 $K[Ag(CN)_2]^{II}$

3 $[Ni(CN)_4]$

4 $[Ni(CO)_4]$

mRRkj 15- (1) $Ag|Ag^{+}(aq)1M||Cu^{2+}(aq)1M|Cu$

$E^{o} = E_{cu^{+2}/cu} - E_{Ag+/Ag}$ ¼1 HkkXk lkj 2 vd ½

$E^{o} = 0.34 - (-0.80)$ ¼2 j HkkXk lkj 3 vd ½

$E^{o} = 1.14V$

dFkkM – Ag ,UkkM – Cu

¼2½

XkYOkUkh LkYk &	f0k|Rk vlk?kVUkh LkYk
1- bLkEk jLkk,kfUkd ÅTkk dk f0k|Rk Ek lkfj0kRkUk gkRkk gA	1- bLkEk f0k|Rk ÅTkk dk jkLkk,kfUkd ÅTkk Ek lkfj0kRkUk gkRkk gA
2- bLkEk Cathode (+) RkFkk Anode (–) /k0k gkRkk g	2- bLkEk Cathode (–) RkFkk Anode (+) /k0k gkRkk g
3- bLkEk nkUkk electrodes vYkXk& vYkXk f0kYk,kUk Ek MCk jgRk g mnkgj.k&MfUk,kYk LkYk	3- bLkEk nkUkk electrodes ,d gh f0kYk,kUk Ek MCk jgRk gA mnkgj.k &UkYLkUk LkYk

¼vFkok½

(1) $Zn(s)|Zn^{++}(aq).5||Ag^{+}(aq)10M|Ag(s)$

dk 298K ij EMF dh x.kuk

($E^{o}Ag = 0.789$, $E^{o}Zn = -0.760$)

gy & ly foHko dk lehdj.k&

$$E_{cell} = E^{o}_{RHS} - E^{o}_{LHS} + \frac{2.303RT}{2F}\log 10\frac{[Ag^{+}(aq)]}{[Zn^{++}(aq)]}$$

$$E_{cell} = [0.798 - (-0.760)] + 2\times\frac{2.303RT}{2F} + \log_{10}\frac{[10]}{[0.5]}$$

$E_{cell} = 1.558 + 0.059 \log_{10}20$

$E_{cell} = 1.558 + 0.059 \times 1.3010$

$E_{cell} = 1.634V$

½2½ ikFkfed ly ,oa f}rh;d ly esa vrj

	ikFkfed LkYk &		f}rh;d ly
1-	ikFkfed ly ,d ckj mi;kx d ckn iw.kZ vkof'kr ugh fd;k tk ldrk gA	1-	f}rh;d ly dk mi;kx d ckn iw.kZ vkof'kr fd;k tk ldrk gA
2-	jklk;fud vfHkfØ;k doy ,d fn'kk esa gkrh gA	2-	jklk;fud vfHkfØ;k nksuksa fn'kk esa gkrh gA

mÙkj 16- IkFkEk dkfV dh vfHkfØ;kvksa d fYk;s nj fLFkjkad dk fUk/kkj.k ¼LkEkkdYkUk dh f0kf/k }kjk½

,d LkkEkkU;k vfHkfØ;kvksa lkj f0kPkkj djUk lkj

A $\rightarrow$ fØ;kvksa QYk

A $a_{gm\ M/L}$

;fn t = T, rc

$(a-x)_{gm\ M/L}$

æ0;kkUkIkkRkh fØ;kvksa d fUk;kEkkUkLkkj

^vfHkdkjd dh vfHkfØ;kvksa dh XkfRk mLkd LkfØ;k Ekk«kk d LkEkkUkIkkRkh gkRkk gA**

vRk% $\frac{dx}{dt} \propto (a-x)$ .....(i)

$$\frac{dx}{dt} = K(a-x) \quad \text{.....(ii)}$$

lk{kkRkj djUk lkj

$$\frac{dx}{(a-x)} = Kdt \quad \text{.....(iii)}$$

LkEkkdYkUk djUk lkj

$$\int_{x_2}^{x_1} \frac{dx}{(a-x)} = K\int_2^1 dt \quad \text{.....(iv)}$$

$$ln(a-x) = Kt + I_0 \quad \text{.....(v)}$$

;kfn $x = 0, t = 0$ .....(vi)

LkEkh dj.k (v) Ek Lk (vi) l I_0 dk EkkUk j[kUk Ikj

$$-ln(a-x) = Kt + (-lna)$$

$$\frac{lna}{ln(a-x)} = Kt$$

Ik{kkRkj djUk Ikj

UkPkjYk YkkXk dk LkkEkkU¸k YkkXk Ek Ikfj0kRkUk Lk

$$K = \frac{1}{t} ln \frac{a}{(a-x)} \text{ ¾ } \frac{2.303}{t} \log \frac{a}{(a-x)}$$

¼vFkOkk½

mÙkj 16 'kU¸k dkfV dh vfHkfØ¸kk d fYk, vfHkfØ¸kk dh nj vfHkdkjdk d Lkkæ.k d 'kU¸k ?kkRk d LkEkkUkIkkRkh gkRk gA

vfHkfØ¸kk R $\rightarrow$ Prodc. Ek

nj ¾ $\frac{-d[R]}{dt} = k[R]^o$ ....(i)

nj ¾ $\frac{-d[R]}{dt} = k \times 1$ D¸kkfd $[R^o] = 1$

$d[R] = -kdt$ ....(ii)

nkUkk vkj dk LkEkkdYkUk djUk Ikj

$[R] = -kt + 1$ ....(iii)

tc $t = 0$ g RkCk $[R] = [R]_0$ ¼R_0 vfHkdkjd dk Ikkjfhkd Lkkæ.k½

; EkkUk LkEkh dj.k (iii) Ek j[kUk Ikj

$[R]_0 = k \times 0 + 1$ ....(iv)

$I = [R]_0$ ....(v)

LkEkh dj.k (iii) vkj (v Lk

$[R] = -kt + [R]_0$ ....(vi)

$K = \frac{[R]_0 - [R]}{t}$

mRrj 17 **QkVkXkkQh d Ikn &**

1- **mnHkkLkUk &** dEkj d YkLk dk 0kLRk Ikj dfæRk dj dN Lkd.M d fYk, Ikdk'k MkYkRk g bLk mnHkkLkUk dkYk dgRk gA bLkLk 0kLRk dk fPk«k lYkV Ikj vk TkkRkk gA

$$2AgBr \rightarrow Ag_2Br + Br$$

2- **M0kYkfIkXk djUkk &** fD0kUkkYk] Ikkbjk XkYkkYk gkbMkfD0kUkkUk ¸kk fEkMkYk dk {kkjh¸k ?kkYk M0kYk Ikj gkRkk g Tkk fd $AgBr$ d Ag Ek vIkPk¸kUk dk Ik.k dj nRkk g bLkLk fUkXkfV0k IkkIRk gkRkk gA

$$C_6H_4(OH)_2 + 2AgBr \rightarrow C_6H_4(OH)_2 + 2Ag\downarrow + 2HBr$$

3- **fLFkjhdj.k &** LkkfM¸kEk Fkk¸kkLkYQV ¼gkbIkk f0kYk¸kUk dk mIk¸kkXk fUkXkfV0k d fLFkjhdj.k gRk fd¸kk TkkRkk g vIk¸kDRk $AgBr$ gkbIkk Ek ?kYkdj vYkXk gk TkkRkk g½

$$AgBrNa_2S_2O_3 \rightarrow Na[AgS_2O_3] + NaBr$$

4- fIkfVXk & fIkfVXk IkIkj IkjfUkXkfV0k d }kjk Ikdk'k MkYkdj dN LkEk¸k d fYk, j[kk TkkRkk g fTkLkLk IkIkj Ikj 0kLRk dh Lkgh fPk«k vfdRk gk TkkRkk g fIkfVXk IkIkj Ikj $AgCl$ fTkYkVhUk dk YkIk gkRkk gA bLk /kkdj Lk[kk YkRk gA

5- VkfUkXk ¸kk jXk LkLdj.k & dkYk LkQn fPk«k dk PkEkdhYkk CkUkkUk gRk $AgCl_3$ dk f0kYk¸kUk mIk¸kkXk fd¸kk TkkRkk g fTkLk VkfUkXk dgRk gA

$$AuCl_3 + 3Ag \rightarrow 3AgCl + Au$$

¼vFkok½

1- v;Ld dk l= ¼& dkIkj Ikkbjkb VhTk $Cu_2S.Fe_2S_3$ ¸kk $CuFeS_2$ 1 vd

2- v¸kLd dk Lkkæ.k ¼& dkIkj d LkYQkbM v¸kLd dk Lkkæ.k QUk mRIYkk0kUk f0kf/k Lk fd¸kk TkkRkk gA IkhLk g, v¸kLd $CuFeS_2$ dk IkkUkh Lk Hkj gkTk Ek MkYk fn¸kk TkkRkk g] RkRIkÜPkkRk PkhM ¸kk ¸kdkfYkIVLk dk RkYk MkYkdj 0kk¸k dh RkYk /kkjk Ik0kkfgRk djUk Ikj v¸kLd ÖkkXk d ÅIkj RkjRkk gA fTkLk vYkXk dj fYk¸kk TkkRkk g vkj v'kf)¸kk UkhPk CkB TkkRkh g] bUkdk vYkXk dj fYk¸kk TkkRkk gA

1 vd

3- HkTkUk %& $2CuFeS_2 + O_2 \rightarrow Cu_2S + 2FeS + SO_2$

$2FeS + 3O_2 \rightarrow 2FeO + 2SO_2$

$Cu_2S + 3O_2 \rightarrow 2Cu_2O + 2SO_2$

IkXkYkUk %& $Cu_2O + FeS \rightarrow Cu_2S + FeO$ 1½ vd

$FeO + SiO_2 \rightarrow FeSiO_3$

4- EkV d ?kVd D;kIkLk LkYQkbM RkFkk Qjlk LkYQkbM gA 1 vd]

$(Cu_2S + FeS)$

5- 'kq)rk Ek Ik;kDRk ,d f0kf/k f0k|Rk vIk?kVUk gA vFkkZr vU;k LkEkd{k f0kf/k dk UkkEk ½ vd

mÙkj 18 vkLVokYM f0kf/k Lk Ukkbfvd vEYk d fUkEkk.k dk fLk)kRk

1 vk;kRkUk vEkkfUk;kk vkj 8 vk;kRkUk Okk;k dk fEkJ.k Pt dh TkkYkh d Åkj 800 808°C RkkIk Ikj IkOkkfgRk fd;kk TkkRkk g Rkk 90 IkfRk'kRk vEkkfUk;kk dk Ukkbfvd vkDLkkbM Ek vkDLkh dj.k gk TkkRkk gA

$4NH_3 + 5O_2 \rightarrow 4NO + 6H_2O$

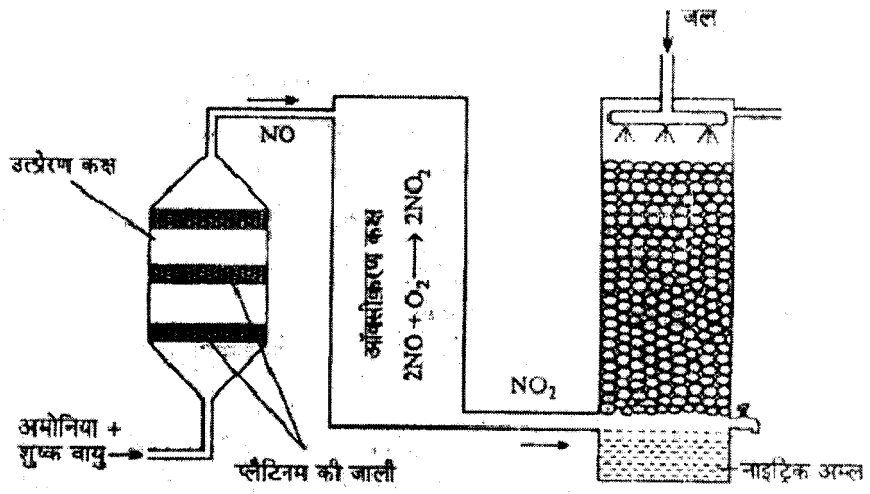
TkYk fEkYkkUk Ikj Ukkbfvd vEYk CkUkRkh gA

$2NO + O_2 \rightarrow 2NO_2$

$2NO_3 + H_2O \rightarrow HNO_2 + HNO_3$

$3HNO_2 \rightarrow HNO_3 + H_2O + 2NO$

UkkEkkfdRk fPk«k %&



¼vFkOkk½

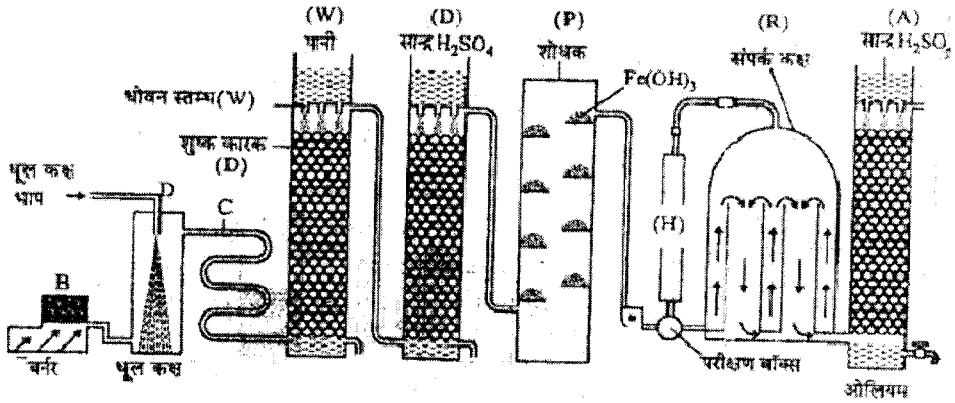
H_2SO_4 d LkIkd d{k f0kf/k dk fLk)kRk &

'k) ,0k 'k"d SO_2 RkFkk 0kk,k d fEkJ.k dk mRIkjd V_2O_5 Ikj Ik0kkfgRk djUk Lk 0kg SO_3 Ek vkDLkhÑRk gk TkkRkk g Tkk TkYk Lk fØ,kk djd H_2SO_4 CkUkkRkk g

$$2SO_2 + O_2 \rightarrow 2SO3 + 45.2\ Kcal$$

$$SO_3 + H_2O \rightarrow H2SO_4$$

UkkEkkfdRk j[kkfPk«k



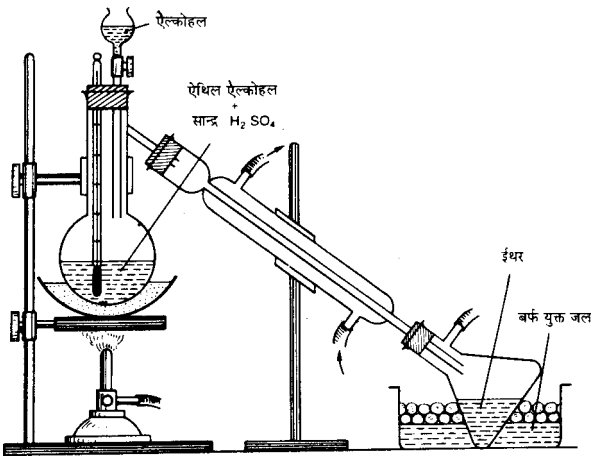
mÙkj 19- ¼1½ Ik,kkXk'kkYkk Ek Mkb,fFkYk bFkj CkUkkUk dh f0kf/k dk jkLk,kfUkd lehdj.k

$$C_2H_5OH + H_2SO_4 \xrightarrow{110^\circ} C_2H_5HSO_4 + H_2O$$

,fFkYk vYdkgYk

$$C_2H_5HSO_4 + HOC_2H_5 \xrightarrow{140^\circ} C_2H_5OC_2H_5 + H_2SO_4$$

¼2½ UkkEkkfdRk fPk«k &



¼3½ f0kf/k dk Lkf{kIRk 0k.kUk & vkLk0kUk ¶YkkLd Ek 100ml Ikfj'k) C_2H_5OH ,0k

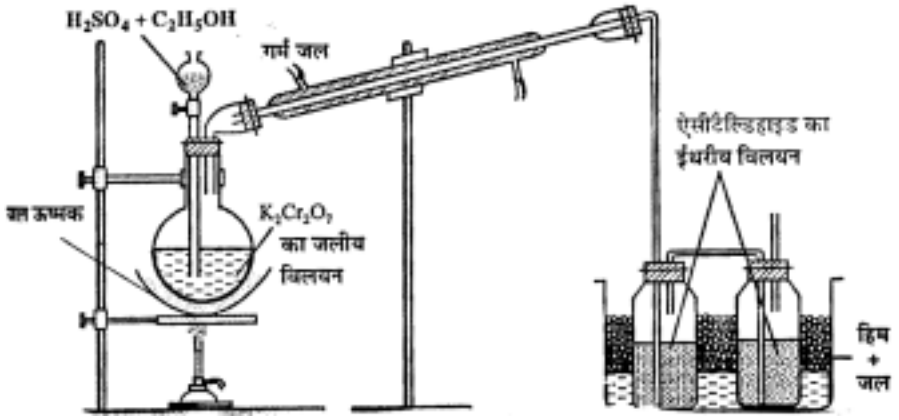
50ml Lkkæ H_2SO_4 Ykdj CkkYk Å"Ekd Ikj Xkjek djRk g RkkIk 140°C Ikj j[kk TkkRkk g A CkQ fEkYk TkYk Lk j[k g, Xkkgh ¶YkkLd Ek bFkj ,d«k dj fYk,kk TkkRkk gA

¼vFkZkkk½

¼1½ ,fLkVfYMgkbM fUkEkk.k d fYk, jkLkk,kfUkd LkEkhdj.k%&

$$CH_3CH_3OH + [O] \xrightarrow{K_2Cr_2O_7} CH_3OH + H_2O$$,fLkVfYkgkbM

¼2½ UkkEkkfdRk fPk«k &



¼3½ fof/k dk lf{kIr o.ku %&

25gm $K_2Cr_2O_7$ dk 100ml TkYk Ek ?kkYkdj ,d XkkYk Iknh d ¶YkkLd Ek YkRk gA fCkndkjh dhIk Ek 35ml, C_2H_5OH RkFkk 20ml cmc H_2SO_4 dk fEkJ.k Ykdj ¶YkkLd dk TkYk m"Ekd Ikj FkkMk XkEk djRk gA CkUkh Okk"Ik Lk?kfj«k ¼XkEk½ Lk XkTkjRkh g CH_3CHO dh Okk"Ik BM dkUkhdYk ¶YkkLd Ek Lk?kfj«k gkdj bFkjh,k fOkYk,kUk CkUkk YkRkh g bLk RkUk H_2SO_4 d LkkFk vkLkfOkRk djUk Lk 'k) ,LkhVfYMgkbM IkkIRk gkRkk gA ¼2]2]2 vd½