



j l k ; u



d { k k x i i



l i i y i z u & i =

1/4 0 | k { p r b d k b 1/2
 N U k h l x < + e k / ; f e d f ' k { k k e . M y] j k ; i g

i u & i = dh ; kst uk Scheme of Question Paper

fo" k; %& j l k; u

i wkk d % 75

l e; % 3 ?k/s

i jh{kk % gk; j l ds Mjh

1/2 'kfk.kd mnns; ds vuq kj eku

(A) Weightage as per Educational objective:

l 0 Ø0	mnns; ;	v d	i fr'kr
1-	Klu (Knowledge)	23	30.7%
2-	vocksk (Understanding)	37	49.3%
3-	vuq; kx , oa dksy (Application & Skill)	15	20.0%
		75	100%

1/2 bdkbdkj v dks dk eku

l 0Ø0	bdkbz dk uke	bdkbz ij vkcfr v d	i u&i = ds ik: i vuq kj vkcfr v d
1-	ijek.kq l j puk , oa j l k- vkcu	4	4
2-	in kfkz dh voLFkk, & Bkd voLFkk	4	4
3-	foy; u	4	4
4-	vk; fud l ke;	4	4
5-	jkl k; fud m"ekxfrdh	4	4
6-	j&k/kl vfhkfØ; k, j o fo-jk- l y	5	5
7-	jkl k; fud cyxfrdh	5	5
8-	ukfhkdh; j l k; u	5	5
9-	l rg j l k; u	4	4
10 (a)	P&cykkl ds l eg 15 o 16	6 *	6 * } 4 * } -10
10 (b)	P&cykkl ds l eg 17 o 18	4 *	
11-	l Øe.k , oa vr% l Øe.k rRo	5	5
12-	mi l gl a ksth ; ksd	4	4
13-	vkDI ht u ; Ør fØ; k l eg	8	8
14-	ukbVrst u ; Ør fØ; k l eg	5	5
15-	nsud thou ea j l k; u	4	4

¼ ½ dfBukl Lrj (Difficulty Level)

l 0 Ø	mnr ;	v	ifr'kr
1-	l jy (Easy)	15	20%
2-	v r (Average)	45	60%
3-	dfBu (Difficult)	15	20%
		75	100%

¼½ izui = fn'kk funk , oa fodYi ; kst uk %

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

- oLrfu"B izu ea ¼05½ cgfodYih; izu rFkk ¼05½ fjDr LFkku dh i firz@mfr tkMk cuk, dk izu fn;k tkoxk v ; g iR; d l v ea izu Øeka 1 gskx A
- iR; d l v ea 1] 2 , oa 3 v dka ds izuka ea fHkUrk jgsh A l eLr 04 v ; k bl l s vf/kd v dks ds y?kqÚkj; rFkk nh?kznÚkj; izuka ea fodYi fn;k tkuk gSA fodYi izu ml h bdkbZ l srFkk l eku mnr ; ka ds jgksA 04 v ; k bl l s vf/kd v dks ds izu iR; d l v ea , d l eku jgksA
- vf/kdre mÚk l hek vfry?kqÚkj; ½ v @30 'kCn½ ½ v @50 'kCn½ y?kqÚkj; ¼ v @75 'kCn½ ½ v @150 'kCn½ nh?kznÚkj; ¼ v ; k vf/kd@250 'kCn½

fodYi ; kst uk

- y?kq mRrjh; izu &
 - 4 v okysdy 4 izu ¼ iØ- 11] 12] 13 o 14½
 - 5 v okysdy 3 izu ¼ iØ- 15] 16 o 17½
- nh?kz mRrjh; izu &
 - 6 v okysdy 2 izu ¼ iØ- 18 o 19½

dy 9 izu

i/u & i = dk Cyfi IV

Blue Print of Question Paper

fo" k; %& j l k; u

i wkkd %75

l e; %3 ?k/s

i jh{kk %gk; j l dsMjh

bdkbz l -Ø-	bdkbz	bdkbz ij vkcfVr vð	vðokj i/u							dy i/u
			1 vð	2 vð	3 vð	4 vð	5 vð	6 vð	6 vð ; k bl l s vf/kd	
1	ijek.kq@ vkcdku	4	1		1					1 + 1
2	Bkd voLFkk	4	1		1					1 + 1
3	foy; u	4				1				1
4	vk; fud l kE;	4	1 1	1						1 + 2
5	jkl k Å"ekxfrdh	4				1				1
6	jMkDI @ l y	5					1			1
7	jkl k cyxfrdh	5					1			1
8	ukfhkdh; j l k; u	5		1	1					2
9	l rg j l k; u	4				1				1
10(a)	P&oxl15@16	6						1		1
10(b)	P&oxl17@18	4	1 1	1						1 + 2
11	l Øe.k rRo	5					1			1
12	mi l gl a ksth ; kS	4				1				1
13	vkDI htU ; Ør fØ; k l eg	8	1 1					1		1 + 2
14	ukbVrstu ; Ør fØ; k l eg	5		1	1					2
15	nsud thou ea j l k; u	4	1 1	1						1 + 2
		75	10@1	5	4	4	3	2	&	18\$1

Set - A

Higher Secondary School Certificate Examination
SAMPLE PAPER

fo"k; %& (Subject) - j l k; u
d{kk %& (Class) - 12oha

l e; 3 ?k.Vk (Time- 3 Hrs)
i vkkid 75 (M.M.)

(Instruction) & Vun? k%

- 1- l Hkh itu gy djuk vfuok; l gSA
Attempt all the Question
- 2- itu Øekad 01 ea 10 v d fu/kk?jr gSA nks dky [k.M gSA [k.M ^v** ea 05
cgfodYih; itu rFkk [k.M ^c** ea 05 fjDr LFkkuka dh i firZ vFkok mfpr
l cdk tkfM, A iR; d itu dsfy, 1 v d vkcfVr gSA
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- itu Øekad 02 l situ Øekad 06 rd vfr y?kqRrjh; itu gSA iR; d itu
ij 02 v d vkcfVr gSA mRrj dh vf/kdre 'kCn l hek 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- itu Øekad 07 l situ Øekad 10 rd y?kqRrjh; itu gSA iR; d itu ij 03
v d vkcfVr gSA mRrj dh vf/kdre 'kCn l hek 50 'kCn A
Q. No. 07 to 10 are short answer type question & it carries 03 marks
each. Word limit is maximum 50.
- 5- itu Øekad 11 l situ Øekad 14 rd y?kqRrjh; itu gSA iR; d itu ea
vkrfjd fodYi gsvk? iR; d itu ij 04 v d vkcfVr gSA mRrj dh vf/kdre
'kCn l hek 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- izu Øekad 18 I s izu Øekad 19 rd nh?kzmRrjh; izu gSA iR; d izu ea
vkrfjd fodYi gSvkj iR; d izu ij 06 vd vkafVr gSA mRrj dh vf/kdre
'kCn I hek 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.

Ikz Uk 1 ¼½ CkghfokdYlkh,k Ikz Uk

- 1- v.k@vk,kuk Tkks sp³d³ Lkdj.k n'kkRkk g&

¼½ XeF ₄	½ SF ₆
¼ ½ XeF ₆	¼½ [Cr(NH ₃) ₆] ³⁺
- 2- fn,kk LkYkkbZ dh fMCCkh Eka LkEkfEkfRk gkRkh g&

¼½ ?kukh,k	½ fok"keKYk&kk{k
¼ ½ f}LkEKYk&kk{k	¼½ , dUKRkk{k
- 3- vk,kukuk dh Ekk<<kk dks IkHkkfokRk Ukgha djUks OkkYkk dkjd g&

¼½ vUKRk RkUK&kk	½ fokYkk,kd dh IkÑfRk
¼ ½ fok &k vk?kV-k dh IkÑfRk	¼½ RkkIk
- 4- fUkEukfYkf [kRk Eka Lks dksLk Lkh xS Okk,kq Eka/Yk Eka Ukgha lkkbZ TkRkh g&

¼½ Ne	½ Rn
¼ ½ Ar	¼½ He
- 5- QkFEkd vEYk&

¼½ TkYk ds LkkFk vFEkJ.kh g&	
½ vEkkSukdYk fLkYokj UkkbVd dk vIkPk,kuk djRkk g&	
¼ ½ , Lkhdvd vEYk Lks RkhUk Xkqkk nqkZk vEYk g&	
¼½ KOH dks XkEkZ djUks lkj IkIRkgkRkk g&	

Que 1 (A) Multiple Choice question -

1. Molecule/ion which shows sp³d³ 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. Which one of the following gas is not present in atmosphere -
- (a) Ne (b) Rn
(c) Ar (d) He
5. Formic acid is -
- (a) non miscible with water.
(b) reduces to ammoniacal silver nitrate solution
(c) three weak in comparison of acetic acid
(d) obtain on heating KOH.

1/2 1/2 fjdRk LFkkUkka dh IkRkZ dhfTk,

- 1- NO⁺ dk LFkkbRk NO Lks &&& gkRk gA
- 2- 1/2 1/2 dk &&& ds IkRk Eka j [kk TkRk gA
- 3- &&&&&& fuk' PkRk ds : Ik Eka Ikz kDRk gkRk gA
- 4- VQYkUk IkYkEkj dk , dYkd &&&&&&&& gA
- 5- Qfjd DYkjbM ds TkYk, k fYk, k dh IkRk &&&&& gkRk 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 aqueous solution of FeCl₃ is

Ikz Uk 2- pH EkkUk dh IkfjHkk"kk , Oka Lkuk fYkf[k, A

Write the formula and definition of pH value.

Ikz Uk 3- æO, kEkkUk {kRk dks IkfjHkkf"Rk dhfTk, A

Define mass defect.

Ikz Uk 4- 1/2 1/2 ds nks v, kLdka ds UkkEk Ok Lkuk fYkf[k, A

Write the name and formulae of two ores of fluorine.

Ikz Uk 5- XkRkYk FkYkEkkbM vfhkØ, kk dks fYkf[k, A

Write Gabriel's phthalimide reaction.

- Q6- Write the name of any two antibiotics drugs.
- Q7- Write any three differences between bonding and Anti-bonding molecular orbitals.
- Q8- What is coordination number ? Write the name of coordination number for octahedral voids.
- Q9- Compare the basic properties of aliphatic amine, aromatic amine and ammonia.
- Q10- Write any three uses of Nuclear fission.
- Q11- Determine the molecular mass of a non volatile solute with the help of elevation of boiling point.
- 1/2 Mark
- Q11- Determine the molecular mass of non volatile solute with the help of depression in freezing point.
- Q12- fLk) dhfTk, fd $\Delta G = \Delta H - T\Delta S$
 Prove that $\Delta G = \Delta H - T\Delta S$
- 1/2 Mark
- fLk) dhfTk, fd $-\Delta G = W_{non-expansion}$

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

13-

Write any four differences between physical adsorption and chemical adsorption.

Write any four differences between physical adsorption and chemical adsorption.

1/2

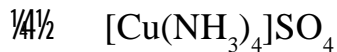
Write any four differences between Lyophilic and Lyophobic colloids.

Write any four differences between Lyophilic and Lyophobic colloids.

14-

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

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



1/2

Write the structural formulae of the following compounds -

1. Pot. ferr. (III) cyanide

1-

2. Pot. Di cyano argentate (I)

2-

3. Tetra Cyano Nickelate (II) ion

3-

4. Tetra carbonyl Nickel (0)

4-

Write the structural formulae of the following compounds -

1. Pot. ferr. (III) cyanide

1.

2. Pot. Di cyano argentate (I)

2.

3. Tetra Cyano Nickelate (II) ion

3.

4. Tetra carbonyl Nickel (0)

4.

15 1/2

Calculate the E° of the following cell -

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

1/2

Calculate the E° of the following cell -

(1)

Calculate the E° of the following cell -

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

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

½/Fl0kk½

¼½ LkYk Zn(s) | Zn²⁺ (aq.) || Ag⁺(aq.) (1.0M) | Ag(s) (1.0M) dk 298K lkj EMF Kkrk djks A ($E^{\circ}_{\text{Ag}^+/\text{Ag}} = 0.789\text{V}$, $E^{\circ}_{\text{Zn}^{2+}/\text{Zn}^-} = -0.76\text{V}$)

½½ IkfFkEd LkYk , Okaf}Rkh,kd LkYk Eka nks vBkj fYkf [k, \

(1) Calculate the EMF of the following cell at Zn(s) | Zn²⁺ (aq.) || Ag⁺(aq.) 10M | Ag(s) (1.0M) [Give that $E^{\circ}_{\text{Ag}^+/\text{Ag}} = 0.789\text{V}$, $E^{\circ}_{\text{Zn}^{2+}/\text{Zn}^-} = -0.76\text{V}$]

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

Ikz Uk 16- IkfFkEd dkSV dh vfHkfØ,kk ds fYk, nj fLFkjkd dh Xk.kukk LkEkcdYkuk fOf/k Lks dhfTk, A

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

½/Fl0kk½

'kw,k dkSV dh vfHkfØ,kk ds fYk, nj fLFkjkd dh Xk.kukk LkEkcdYkuk fOf/k Lks dhfTk, \

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

Ikz Uk 17- QkV/kkktQh ds fUkEuk Iknka dks LkEkÖkkb,k&

1- mnHkkLkuk

2- MskYkfkak

3- fLFkjhdj.k

4- flkfVak

5- VksUkak ,kk jak LkEdj.k

Explain photography on following points -

(i) Exposure

(ii) Developing

(iii) Fixation

(iv) Printing

(v) Toning

½/Fk0kk½

dkWkj IkkkjkbVhTk Lks Rkkçkk ds fuk"d"lz k ds fUkEUK Iknka dks LkEkÖkkb,ks

- 1- v,klD dk Lkwk
- 2- v,klD dk Lkkae.k
- 3- HkTkçk , Oka IkçkYkUk Iknka Eka IkçkçRk jkLkk,kfUkd vfHkfØ,kk
- 4- EKS/ ds?kVd
- 5- 'kkskUk Eka IkçkçRk ,d fokf/k dk UKkEk A

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

- (i) Formula of ore
- (ii) Concentration of ore
- (iii) main reactions in roasting
- (iv) component of matte
- (v) name of one method involved in purification method.

Ikz Uk 18- vkL VOkkYM fokf/k Lks UKkbfVd vEYk ds fUkEkçk dks fUkEUK fçkany/ka ds vk/kkj Ikj fYkf[k, &

- 1- fLk) kRk
- 2- UKkEkçRk fPk«k
- 3- IkçkçRk jkLkk,kfUkd vfHkfØ,kk, j

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

- (i) Principle
- (ii) Labelled diagraeme
- (iii) chemical reaction used in the process.

½/Fk0kk½

LkY¶,kfj d vEYk ds fUkEkçk dh LkçkdZ fokf/k dk Ok. kçk fUkEUK fçkany/ka ds vk/kkj Ikj dhfTk, &

- 1- fLk) kRk

- 2- UKkEkkf dRk fPk«k
- 3- Ikz,kDkRk j kLkk, kFukd vfhkfØ, kk, A

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

- (i) Principle
- (ii) Labelled diagraph
- (iii) Chemical reactions used in the process.

Ikz Uk 19- Ikz,kk«k' kkYkk Eka Mkb, fFkYk bFkj ds fUkEkkz k dks fUkEUk fCkanq/ka ds vk/kkj Ikj fYkf [k, &

- 1- j kLkk, kFukd LkEkdj .k
- 2- UKkEkkf dRk fPk«k
- 3- fOkf/k dk Lk«kIRk Ok. k«k

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

- (i) Chemical equation
- (ii) Labelled diagraph
- (iii) Method in brief.

½/FkOkk½

Ikz,kk«k' kkYkk Eka , fLkVfYmGkbM dk fUkEkkz k fUkEUk fCkanq/ka ds vURkXkRk dhfTk, &

- 1- j kLkk, kFukd LkEkdj .k
- 2- UKkEkkf dRk fPk«k
- 3- fOkf/k dk Lk«kIRk Ok. k«k A

Explain the Lab method preparation of CH₃CHO in the following points-

- (i) Chemical equation
- (ii) Labelled diagraph
- (iii) Method in brief.

वन'कz मुकु Lk/&,

- mukj 1 1/2 0kLRkqk"B
- 1- 1/2k1/2
 - 2- 1/2k1/2
 - 3 1/2/1/2
 - 4 1/2k1/2
 - 5 1/2k1/2
- 1/2k1/2 fj DRk LFKkUK Hkj ks &
- 1 T, kknk
 - 2 Rkkckk
 - 3 DYkkj kQKEKZ
 - 4 V3/R 1Ykkj ks , fFkFYkUK
 - 5 vEYkh, k A

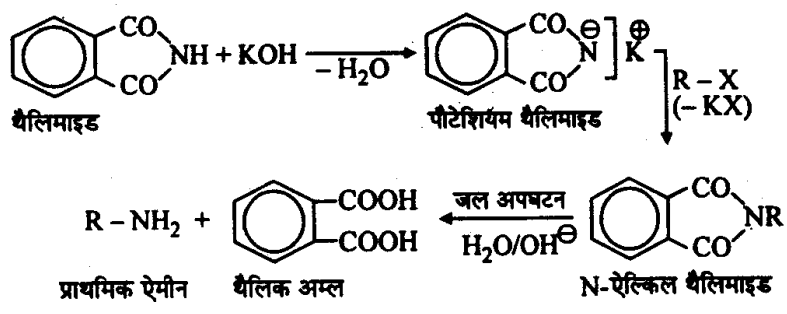
mukj 2 fdLkh fokYkUK dk pH EkkUK mLk __.kkREkd ?kkRk ds Lka, kkREkd EkkUK ds Ckj kckj gkRkk gSA fTKLks 10 Ij YkXkk, kk TKkUK Pkfg, fTKLkLks mLk fokYk, kUK dk H+ vk, kUK LkkUæ. k n'kkzkk Tk LkdA

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

mukj 3 tc dkbz i jek. kq vOk, kOkh U, kv/RUKka RkFkk IkkVRkka dh mlk, kDRk Lka, kk Lks CkURkk gS rks UkkfHkd dk æ0, kEkkUK LknSk 1/2 Hydrogen dks NkMdj 1/2 U, kFDYk; kuka ds dyk æ0, kEkkUK Lks dEk gkRkk gA æ0, kEkkUK Eka, kg dEk æ0, kEkkUK {kfrk dgYkkRkh gA bLkd dkj. k vkbUVhuk LkEhdj. k E = mc^2 ds vUkkkj ÅTKkz EkDRk gks. k gA

- mRrj 4 nks v; Ld
- 1- 1Ykj Li kj CaF₂
 - 2- Øk; ksykbV Na₃AlF₆

mRRkj 5



- mùkj 6 nks IkFRkTksOkd vkSkf/k; kj
- 1- IksUkFLkFYkUk
 - 2- LVVVKkkbFLkUk
- mùkj 7- CkU/kh vk. kfOkd d{kd IkFRk vkCkakh vk. kfOkd d{kd
- 1- bukdh ÅTkk Lkakkk djUks OkkYks IkjEkk. kq 1- bukdh ÅTkk Lkakkk djUks OkkYks IkjEkk. kq d{kdk Lks dEk gkRkh gS 1- bukdh ÅTkk Lkakkk djUks OkkYks IkjEkk. kq d{kdk Lks vf/kd gkRkh gS
 - 2- Ckakh vk. kfOkd d{kdk ds dkj .k v. kq 2- fOkkfjRk Ckakh vk. kfOkd d{kd v. kq Eka gEks kk vLFkkf ,kRk YkRks gS
 - 3- bLkEka UkkMYk RkYk Ugha gkRkh 3- bLkEka UkkMYk RkRk gkRkh gS
- mRRkj 8- f«kT ,kk vUkkkRk fdLkh fØLVYk Eka mikFLFRk /kuk vk ,kuk RkFk __.k vk ,kuk fd f«kT ,kkvka dk vUkkkRk gkRkh gS A

$$f«kT ,kk vUkkkRk = \frac{/kukkREd f«kT ,kk r^+}{_ .kk ,kuk f«kT ,kk r^-}$$

fØLVy Eka f«kT ,kk vUkkkRk mLkds /kuk vk ,kuk dh dks/kMhDks kuk Lkq ,kk dks fUk/kkZjRk djRk gS

v"VQYkdh ,k fjDRk ,kk & , d f} f«kdksh ,k fjDRk Tkks N% XkksYkka }kj f?kj h jgRkh gS v"VQYkdh ,k fjDRk dgYkkRkh gS

LkqkafYkRk O ,kOkLFkkk Eka v"VQYkdh ,k fjDRk ,kka dks Lkq ,kk ds Ckj kCkj gkRkh gS vRk% IkR ,kd XkksYks ds LkFk , d v"VQYkdh ,k QYkdh ,k fjDRk gkRkh v"VQYkdh ,k fjDRk dh f«kT ,kk dk vdkj XkksYks ds f«kT ,kk ds vdkj dk 0-414 Xkqkk gkRkh gS

$$\frac{r \text{ void}}{r \text{ sphere}} \approx 0.414$$

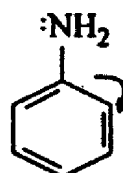
mùkj 9- , fykfQfVd , ehuk] , jkEkhVd , Ekhuk vkj vEksUk ,kk ds {kkj h ,k Xkqkka dh RkYkUkk

{kkj h ,k Xkqk

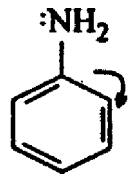
, fykQfVd , ehuk

, jkEkhVd , Ekhuk

vEksUk ,kk



2- +I Effect CH_3 by DVru Ekkkkk d lkkkk ds bLkdk {kkjh, k Xk. kq
 fuekph l eg gkus ds dkj. k NH_2 ds UkkbVrSTkuk ij by DVru
 dkj. k vf/kd {kkjh; UkkbVrSTkuk ds byk DVru ?kuRo ij fuHkj
 gksk ; Ee CkTkhuk fCkdj Eka djrk gA
 fOKLFkuhRkNRk gkus ds
 ds dkj. k {kkjh; rk
 de gsrh gA

3- {kkjh, k dk ?kVRkk gqvk ØEk $\text{CH}_3 - \text{NH}_2 > \text{NH}_3 >$ 
 , SYkQSVd , Ekhuk vEkkkUK, kk , YkfhUKYk A

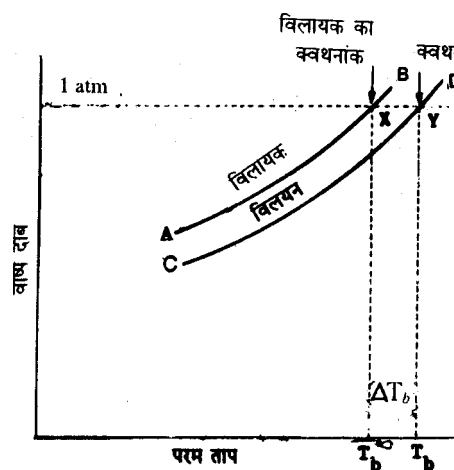
mUkj 10

- 1- UkkHkdh, k fj, kDVj Eka fOK [k&Uk Rkkk@ÅTkkz mRlKUK djUks ea
- 2- UkkfHkdh, k fOK [k&Uk Lks JqEYkk vfHkfØ, kk PKYkdj ÅTkkz mRlKknd gkRkk gA
- 3- UkkfHkdh, k fOK [k&Uk Lks lkkRk ÅTkkz dk mlk, kkkk bÅUk , d fOK | Bk ÅTkkz mRlKUK djus ea

mRRkj 11

DoFkukad ea mlu; u ds vk/kkj ij v. kkkkj dh x. kuk%&
 jkmYV dsfu; ekuq kj&
 tc fdl h ok"i 'khy 'kq) foyk; d ea vok"i 'khy foy; feyk; k tkrk gS rks
 foy; u ds DoFkukad ea of) gkus yxrh gS tks fd foy; ds eksyi HkkT ds
 l ekuq krh gsrk gA

1/1 1/2



चित्र 3-6—बोधनताप में उन्नयन

jkÅYV fu; ekuq kj

$$T_b - T^{\circ}b = \Delta T_b$$

$$\Delta T_b \propto m \quad \dots\dots(i)$$

$$\Delta T_b = k_b m \quad \dots\dots(ii)$$

$$\therefore m = \frac{W_B}{M_B} \times \frac{1000}{W_A} \quad \dots\dots(iii)$$

I ehdj.k (ii) ea m dk eku j [kus i j

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

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

t gka $M_B =$ foyş dk v.kkkj

$K_b =$ eksy DoFkukad mlu; u fLFkjkd

$\Delta T_b =$ DoFkukad ea mlu; u

$W_A =$ foyk; d dk Hkkj

$W_B =$ foyş dk Hkkj

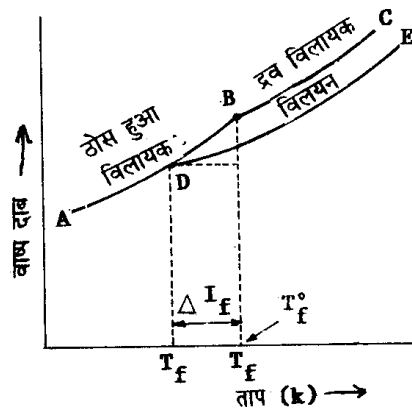
¼/Fkok½

fgek d svoue ds vk/kkj ij v.kkkj dh x.kuk&

jkÅYV dsfu; ekuq kj ^tc fdl h ok"i 'khy 'kq) foyk; d eavok"i 'khy foyş

feyk; k tkrk gSrksfoy; u dsok"i nkc eadeh gks tkrh gStksfd ml dsfgel

ea voueu ds l ekuq krh gsrh gA**



jkÅYV fu; ekuq kj

$$T_f - T^{\circ} f = \Delta T_f$$

$$\Delta T_f \propto X_B \quad \dots\dots(i)$$

$$\Delta T_f = kX_B \quad \dots\dots(ii)$$

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

I ehdj.k (ii) ea X_B dk eku j [kus ij

$$\Delta T_f = K \times \frac{W_B}{M_B} \times \frac{M_A}{W_A} \quad \dots\dots(iii)$$

nksuka vkj 1000 dk xqkk djus ij

$$\Delta T_f = \frac{KM_A}{1000} \times \frac{W_B}{M_B} \times \frac{1000}{W_A} \quad \dots\dots(iv)$$

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

$$\Delta T_f = K_f \times \frac{W_B}{M_B} \times \frac{1000}{W_A} \quad \dots\dots(iv)$$

i {kkUrj djus ij

$$; k \quad M_B = \frac{K_f \times W_B \times 1000}{\Delta T_f \times W_A}$$

tgka $M_B =$ foyş dk v.kkkj

$K_f =$ eksy DoFkuka d mlu; u fLFkjka d

$\Delta T_f =$ DoFkuka d ea voueu

$W_A =$ foyk; d dk Hkkj

$W_B =$ foyş dk Hkkj

mRRkj 12

fl) djuk gS $\Delta G = \Delta H - T\Delta S$

fdl h fudk; dh eDr Åtkz Åtkz dh og ek=k gS tks vf/kdre mi ; ksch dk; 7 eai fjofr r gsr h gSeDr Åtkz dseku dks LFkj rki , oankc ij ifjdfyr djrs gSeDr Åtkz dks fuEukud kj I si fjdfyr djrs gS

$$G = H - TS \quad \dots(i)$$

pfd] $H = E + PV$

$$G = E + PV - TS \quad \dots(ii)$$

eDr Åtkz volFkk Qyu gS vr%

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

$$\Delta G = \Delta E + P\Delta V + V\Delta P - T\Delta S - S\Delta T \quad \dots(iv)$$

eDr Åtkz ifjorU ds l e; rki , oankc flFkj gks rc

$$T = \text{flFkj}] \quad S\Delta T = 0$$

$$P = \text{flFkj}] \quad V\Delta P = 0$$

I eh- (iv) I s

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

pfd $\Delta H = \Delta E + P\Delta V]$ $\Delta H =$, UFKY ih ifjorU

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

bl sgh fXCl gYegkSV-t I ehdj.k dgrs gS

1/2Fkok1/2

ΔG fdLkh jkLkk kfUkd vfHkfØ,kk dh Lokrk% IkOkFRkRkk dh EkRk gS Å"EkkXkFRk ds

IkFkEk fUk,kek Lks $\Delta E = q + w$

$$q = \text{Rkæk } \}kjk \text{ vOk' kks"krk m"Ekk}$$

$$\Delta E = \text{vkRkfjd ÅTkz Ikfj OkRkOk}$$

$$w = \text{Rkæk Ikj fd,kk Xk,kk dk,kz gS}$$

,kfn gEka fdLkh Rkæk }kjk fd,ks Xk,ks dk,kz dh Xk.kUkk djUkh gks Rkks w ds LFkkUk Ikj

&w YkSkk IkMxkk vRk% $\Delta E = q - w$

$$q = \Delta E + w$$

Rkæk }kjk fd,kk Xk,kk dk,kz w IkLkkj dk,kz vkSj vIkLkkj dk,kz nksSkka dk, kKk gSA

vIkLkkLkj dk,kz ds mlk, kKk dk,kz ds : Ik Eka Ikz kDRk fd,kk TkK LkdRkk gS mLks vnkCk

वक्रकृत द्रव्य मात्रा का द्रव्य द्रव्य गणना

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

$$w_{\text{exp}} = p\Delta V$$

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

इस प्रकार, ऊष्मागतिक प्रक्रिया

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

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

इस प्रकार, प्रक्रिया में उत्पन्न कार्य,

$$\Delta S = \frac{q_{\text{rev}}}{T} \quad , \quad q_{\text{rev}} = T\Delta S$$

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

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

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

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

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

उदाहरण 13

उदाहरण 13

- 1- 1.0 mol of a gas expands from 10 L to 20 L at 300 K. Calculate the work done by the gas.
- 2- 1.0 mol of a gas expands from 10 L to 20 L at 300 K. Calculate the change in internal energy.
- 3- 1.0 mol of a gas expands from 10 L to 20 L at 300 K. Calculate the change in enthalpy.
- 4- 1.0 mol of a gas expands from 10 L to 20 L at 300 K. Calculate the change in Gibbs free energy.

उदाहरण 13

- 1- 1.0 mol of a gas expands from 10 L to 20 L at 300 K. Calculate the work done by the gas.
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- 4- 1.0 mol of a gas expands from 10 L to 20 L at 300 K. Calculate the change in Gibbs free energy.

¼/Flok½

æOk LUKgh dks/kkbMYk &

- 1- fOkYkqk dks fOkYkk, kd Eka ?kksYkUks lkj OkURkk gA
- 2- , ks LFkk, kh gkRks gS buKds LFkk, kh dj . k 2- ds fYk, LFkk, kh dj d lknkFkZ fEYkkUks dh vkOk' , kdRkk Ukggha gkRkh gA
- 3- bLkds LdUnUk ds fYk, fOk | Bk vik?kV; dh vf/kd Ekk«kk dh vkOk' , kdRkk gkRkh gS
- 4- dksYkkbMYkh fOkYk, kUkka ds d . kka ds LkkFk vf/kdRkk Eka fOkYkk, kd TkYk ds d . k TkM/s jgRks gA

æOk fOkjks/kh dks/kkbMYk &

- 1- buKdks OkUkkUks ds fYk, fOk' ksk fOkf/k, kkj vIkUkkUkh lknRkh gA
- 2- buKds OkUkkRks LkEk, k buKEka LFkk, kh dj d lknkFkZ fEYkk, kk TkRkk gA , ks vR, kRk vLFkk, kh gkRks gA
- 3- fOk | Bk vik?kVî dh vR, kRk dEk Ekk«kk Hkh buGa LIknRk dj nRkh gA
- 4- buK dksYkkbMh fOkYk, kUkka ds d . k ds LkkFk fOkYkk, kd ds d . k TkM/s Ukggha gkRks gA

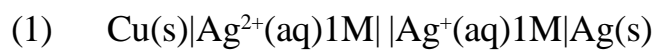
mUkj 14-

- 1- lkkS/S' k, kEk gDLkk Lkk, kukQjS/ (II)
- 2- gDLkk , EkhUk dkskYV (III) ¶lykj kbM
- 3- lkkS/S' k, kEk VS/R vk, kkbMkEkj D, kjS/ (II)
- 4- VS/R , EkhUk dknkj (II) LKYQV

¼/Flok½

- 1- $K_3[Fe(CN)_6]^{III}$
- 2 $K[Ag(CN)_2]^{II}$
- 3 $[Ni(CN)_4]$
- 4 $[Ni(CO)_4]$

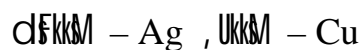
mRRkj 15-



$$E^\circ = E^\circ_{cathode} - E^\circ_{Anode}$$

$$E^\circ = 0.80 - 0.34$$

$$E^\circ = 0.46V$$



¼1 HkkXk lkj 2 v d ½

½2 js HkkXk lkj 3 v d ½

½½

ආරම්භක ලිපි &

- 1- බලකා ජලක, ක්ෂුද්‍ර ආර්ථිකයේ දී ජල | ජල
එක ජල ජලක ගැනීමේදී
- 2- බලකා Cathode (+) වලින්
Anode (-) වලින් ගැනීමේදී
- 3- බලකා නිකුත් වන විටදී
විද්‍යුත් ජලක, එක මොස ජලක
මෙහිදී ජලක, විද්‍යුත් ලිපි

ජල | ජල වලින් ආරම්භක ලිපි

- 1- බලකා ජල | ජල ආර්ථිකයේ දී
ජලක, ක්ෂුද්‍ර ආර්ථිකයේ එක ජල ජලක
ගැනීමේදී
- 2- බලකා Cathode (-) වලින්
Anode (+) වලින් ගැනීමේදී
- 3- බලකා නිකුත් වන විටදී
ජලක, එක මොස ජලක
මෙහිදී ජලක & විද්‍යුත් ලිපි

½ෆ්ෆ්

- (1) $Zn(s)|Zn^{++}(aq).5||Ag^+(aq)10M|Ag(s)$
දී 298K දී EMF හි වැටුප

$$(E^\circ Ag = 0.789, E^\circ Zn = -0.760)$$

ජල & විද්‍යුත් ජලක දී විද්‍යුත් ජලක

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

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

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

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

$$E_{cell} = 1.634V$$

½½

විද්‍යුත් ජලක, විද්‍යුත් ජලක

විද්‍යුත් ලිපි &

- 1- විද්‍යුත් ජලක, විද්‍යුත් ජලක
විද්‍යුත් ජලක, විද්‍යුත් ජලක
විද්‍යුත් ජලක, විද්‍යුත් ජලක
- 2- විද්‍යුත් ජලක, විද්‍යුත් ජලක
විද්‍යුත් ජලක, විද්‍යුත් ජලක

විද්‍යුත් ජලක

- 1- විද්‍යුත් ජලක, විද්‍යුත් ජලක
විද්‍යුත් ජලක, විද්‍යුත් ජලක
විද්‍යුත් ජලක, විද්‍යුත් ජලක
- 2- විද්‍යුත් ජලක, විද්‍යුත් ජලක
විද්‍යුත් ජලක, විද්‍යුත් ජලක

mùkj 16-

lkfkek dksV dh vfHkfØ,kk ds fYk,ks nj fLFkjkd dk fuk/kkj .k lkekhdYkuk dh fof/k }kj½

, d Lkekku, k vfHkfØ,kk lkj fofpkj djUks lkj

A → fØ,kk QYk

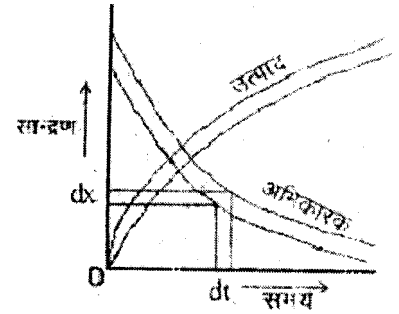
A $a_{gm M/L}$

; fn $t = T$, rc

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

æO,kkukkkRkh fØ,kk ds fuk,kEkkukkkj

^vfHkdj d dh vfHkfØ,kk dh XfRk mLkds LkfØ, k Ekk«kk ds LkekkukkRkh gBkk gA**



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

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

lk{kkRkj djUks lkj

$$\frac{dx}{(a - x)} = K dt \quad \dots\dots(iii)$$

LkekhdYkuk djUks lkj

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

$$\ln(a - x) = Kt + I_0 \quad \dots\dots(v)$$

kfñ $x = 0, t = 0 \quad \dots\dots(vi)$

Lkekhdj .k (v) Eka Lks (vi) I s I_0 dk Ekkuk j [kUks lkj

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

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

lk{kkRkj djUks lkj

UkPkj Yk Ykkvk dks Lkekku, k Ykkvk Eka lkfj QkRkZk Lks

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

mRkj 16 'k' dksV dh vfHkfØ,kk ds fy, vfHkfØ,kk dh nj vfHkdj dka ds Lkæ. k ds 'k' k ?kRk ds LkEkkkRk ghBks gA

vfHkfØ,kk R → Prodc. Eka

$$nj \quad \frac{-d[R]}{dt} = k[R]^0 \quad \dots(i)$$

$$nj \quad \frac{-d[R]}{dt} = k \times 1 \quad D, kkd [R]^0 = 1$$

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

nkBkka vkj dk LkEkdYkuk djUks lkj

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

t c t = 0 gS RkCk [R] = [R]₀ 1/2 R₀ vfHkdj d dk lkj fHkd Lkæ. k/2

; s Ekkuk LkEhdj .k (iii) Eka j [kUks lkj

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

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

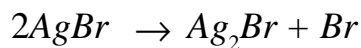
LkEhdj .k (iii) vkj (v) Lks

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

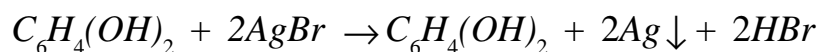
$$K = \frac{[R]_0 - [R]}{t}$$

mRrj 17 Qk/kkQh ds lkn &

- 1- mnHkLkuk & dskjs ds Ykuk dks OkLRkq lkj dhæRk dj dN Lkd .M ds fy, lkdk'k MkYRks gS bLks mnHkLkuk dkYk dgrks gA bLkLks OkLRkq dk fpkæ Yk/ lkj vk TkkRk gA



- 2- MSYkfkdk djUk & fDokkYk] lkbjkkYkYk gkbMkSDokkdk ,kk fEkMkYk dk {kj,h,k ?kYk MSYk lkj gkRk gSTkksfd AgBr ds Ag Eka vIkP,kuk dks lkWZ dj nBk gS bLkLks fukksVok lktRk gkRk gA

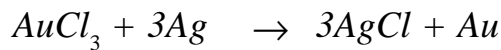


- 3- fLFkjhdj .k & LkksM₃kEk Fkk₃kkLKYQs/ ½gkbIkks fokyk₃kuk dk mlk₃kkkxk fukxksVok ds fLFkjhdj .k gBkqfd₃kk TkkRkk gS vIkzkpDRk AgBr gkbIkks Eka ?kykdj vYkXk gks TkkRkk g%



- 4- fikaVxk & fikaVxk IkSkj Ikj fukxksVok ds }kjk Ikzk'k Mkykdj dN LkEk₃ ds fyk₃ j [kk TkkRkk gSFTkLkLks IkSkj Ikj OkLRkqdh Lkgh fPk«k vfdRk gks TkkRkk gSfikaVxk IkSkj Ikj AgCl fTKYks/huk dk Yksk gBRkk gA bLks /kkcdj Lk[kk YkRks gA

- 5- Vksukxk₃kk jxk Lkdj .k & dkyks LkQn fPk«k dks PkEdhYkk OkukLks gBkqAgCl₃ dk fokyk₃kuk mlk₃kkkxk fd₃kk TkkRkk gS fTKLks Vksukxk dgRks gA



½vFkok½

- 1- v;Ld dk I# %& dkkj IkkbjkbVhTk Cu₂S.Fe₂S₃ ,kk CuFeS₂ 1 vd
 2- v₃kLd dk Lkkae.k %& dkkj ds LkYQkbM v₃kLd dk Lkkae.k QSk mRiYkkOkuk fokf/k Lksfd₃kk TkkRkk gA IkhLksgg v₃kLd CuFeS₂ dks IkkUkh Lks Hkjs gkSt'k Eka Mkyk fn₃kk TkkRkk gS RkRkUpkRk PkhM₃kk₃kkdkSYkIVek dk Rkyk Mkykdj Okk₃kq dh Rkyk /kkjk IkdkfgRk djUks Ikj v₃kLd Okkx ds Akj RkRkk gA fTKLks vYkXk dj fyk₃kk TkkRkk gS vksj v'kfj) ,kka UkhPks CkB TkkRkh gS bukdks vYkXk dj fyk₃kk TkkRkk gA

1 vd

- 3- HkTdk %& $2CuFeS_2 + O_2 \rightarrow Cu_2S + 2FeS + SO_2$
 $2FeS + 3O_2 \rightarrow 2FeO + 2SO_2$
 $Cu_2S + 3O_2 \rightarrow 2Cu_2O + 2SO_2$

- IkxkYkuk %& $Cu_2O + FeS \rightarrow Cu_2S + FeO$ 1½ vd
 $FeO + SiO_2 \rightarrow FeSiO_3$

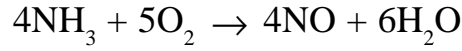
- 4- Eks/ ds ?kVd D₃kkLk LkYQkbM RkFkk QjLk LkYQkbM gA 1 vd]
 (Cu₂S + FeS)

- 5- 'kks'kuk Eka IkzkpDRk , d fokf/k fok | Bk vIk?kVuk gA vFokk vU₃k LkEd{f fokf/k dk Ukek ½ vd

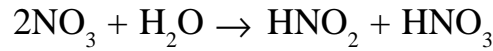
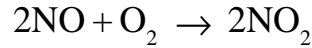
mùkj 18

vkL VOKYM fokf/k Lks UkkbfVd vEYk ds fUkEkZ k dk fLk) kRk

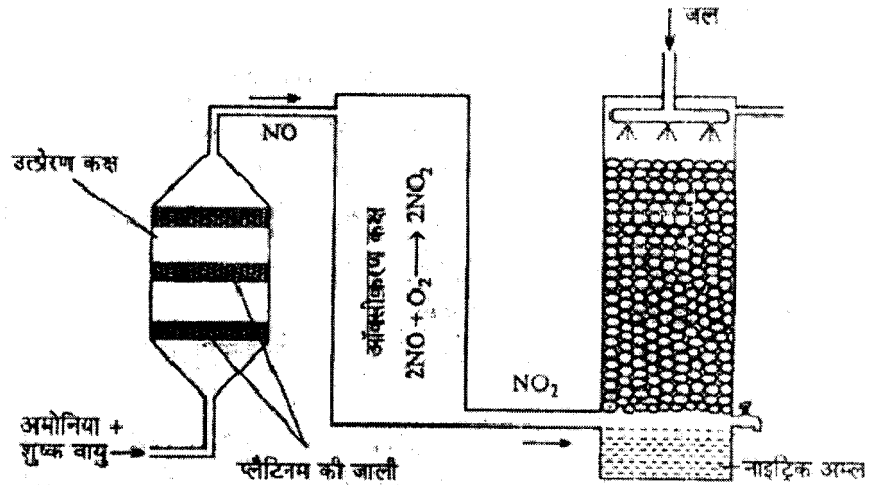
1 vk₃kRkUk vEkkSUK₃kk vkj 8 vk₃kRkUk Okk₃kq dk fEkJ.k Pt dh TkYKh ds Ålkj 800 808°C RkkIk lkj IkKkfgRk fd₃kk TkkRkk gS Rkks 90 IkFRk'kRk vEkkSUK₃kk dk UkkbfVd vkDLkbbM Eka vkDLkhdj.k gks TkkRkk gA



TKYk fEKYkkUks lkj UkkbfVd vEYk CkUkRkh gA



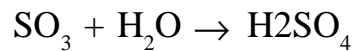
UkkEkKfdRk fPk«k %&



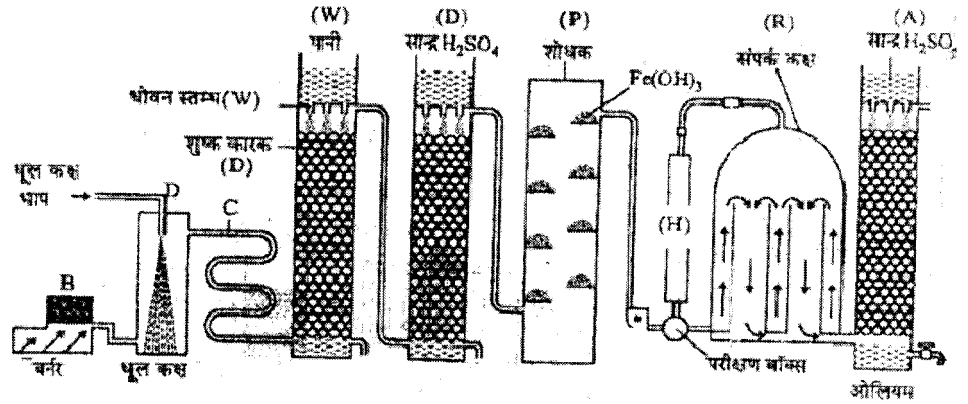
¼/FkOkk½

H₂SO₄ ds LkKkdZ d{k fokf/k dk fLk) kRk &

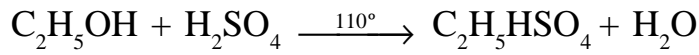
'kq) , Oka' ktd SO₂ RkFkk Okk₃kq ds fEkJ.k k dks mRlkj d V₂O₅ lkj IkKkfgRk djUks Lks Okg SO₃ Eka vkDLkhdj.k gks TkkRkk gS Tkks TKYk Lks fØ₃kk dj ds H₂SO₄ CkUkRkk gS



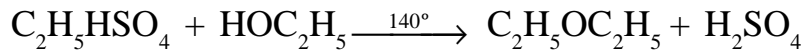
उत्कृष्टीकरण जलकृत



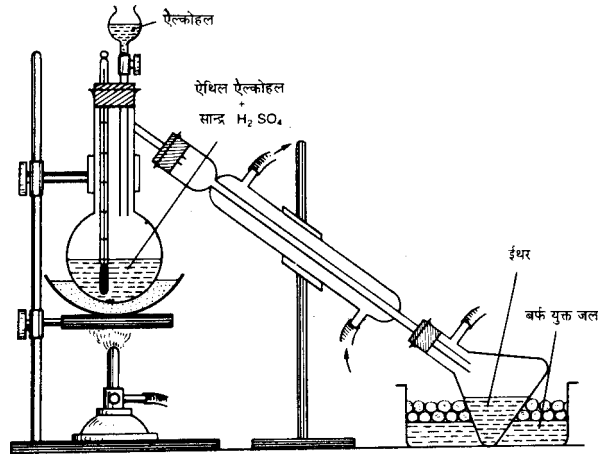
मुक्ति 19- 1/2 लकृतकृत कृतक एक मक, फृतक बतक कुकुकुत ध फुक/क क जलकृतकृत । हदज .क



, फृतक वदकृतक



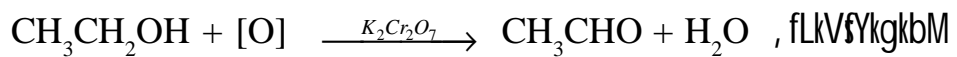
1/2 उत्कृष्टीकरण फकृत &



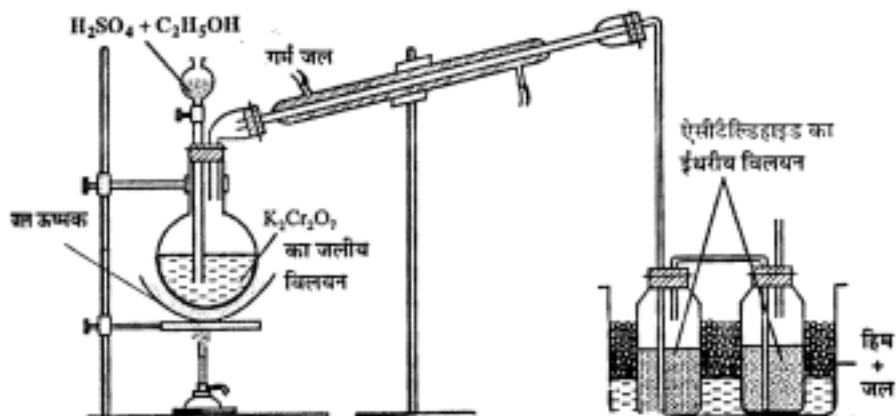
1/2 फुक/क क लकृतकृत क. कृत & वलकुकुत कृतकृत एक 100ml कृतकृत) C_2H_5OH , क 50ml लकृत H_2SO_4 कृतक कृतकृत "एक लकृत कृतकृत कृतकृत 140°C लकृत ज कृत कृतकृत कृतकृत कृतकृत कृतकृत लकृत कृतकृत कृतकृत एक बतक , कृत कृतकृत कृतकृत कृतकृत

1/2 फुक/क

1/2 , फलकृतकृतकृत फुकृतकृत क कृतकृत, जलकृतकृतकृत लकृतकृतकृतकृत



1/2 1/2 UKKkKfCRk fPk«k &



1/3 1/2 fof/k dk I f{kr o.kU %&

25gm $K_2Cr_2O_7$ dks 100ml TKYk Eka?kkYkdj , d XkkYk Ikarh ds 1YkkLd Eka YkRks gA fCknpkjh dhik Eka 35ml, C_2H_5OH RkFkk 20ml emc H_2SO_4 dk fEkJ.k Ykdj 1YkkLd dks TKYk m"Ekd IkJ FkkMk XkEkZ dj Rks gA CkUk Ok"ik Lkafj«k Lks XkafjRk gS CH_3CHO dh Ok"ik BMs dkkhdYk 1YkkLd Eka Lkafj«k gkdj bEkjh,k fOkYk,kUk CkUk YkRk gS bLks RkUq H_2SO_4 ds LkFk vLkfoRk dj Uks Lks 'k) , LkhSYMgkBM IkkIRk gkRk gA

1/2]2]2 vcl 1/2

Set - B

gkbz Ldwy I VhfQdV i jh{k
High School Certificate Examination
I fiy&i zu i=
SAMPLE PAPER

fo" k; % (Subject) - j l k; u
d{kk % (Class) - 12oha

I e; 3 ?k.Vk (Time- 3 Hrs)
i vkkid 75 (M.M.)

(Instruction) & Vfun?kz

- 1- I Hkh i zu gy djuk vfuok; Z gSA
Attempt all the Question
- 2- i zu Øekad 01 ea 10 v d fu/kkzjr gSA nks dky [k.M gSA [k.M ^v** ea 05
cgfodYih; i zu rFkk [k.M ^c** ea 05 fjDr LFkkuka dh i firZ vFkok mfp
I cdk tkfM, A iR; d i zu dsfy, 1 v d vkcfVr gSA
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 zu Øekad 02 I si zu Øekad 06 rd vfr y?kqRrjh; i zu gSA iR; d i zu
ij 02 v d vkcfVr gSA mRrj dh vf/kdre 'kCn I hek 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 zu Øekad 07 I si zu Øekad 10 rd y?kqRrjh; i zu gSA iR; d i zu ij 03
v d vkcfVr gSA mRrj dh vf/kdre 'kCn I hek 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 zu Øekad 11 I si zu Øekad 14 rd y?kqRrjh; i zu gSA iR; d i zu ea
vkrfjd fodYi gSvkj iR; d i zu ij 04 v d vkcfVr gSA mRrj dh vf/kdre
'kCn I hek 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- izu Øekad 18 I s izu Øekad 19 rd nh?kzmRrjh; izu gSA iR; d izu ea
vkrfjd fodYi gSvkj iR; d izu ij 06 vd vkafVr gSA mRrj dh vf/kdre
'kCn I hek 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.

Q.1. $\frac{1}{4}$ mark each

- O_2^{2-} has 4 bonding electrons and 8 lone pairs of electrons.

$\frac{1}{4}$ mark	4	$\frac{1}{4}$ mark	6
$\frac{1}{4}$ mark	8	$\frac{1}{4}$ mark	10
- Amorphous solid is -

$\frac{1}{4}$ mark	Graphite	$\frac{1}{4}$ mark	Monocline sulphur
$\frac{1}{4}$ mark	Glass	$\frac{1}{4}$ mark	White tin
- Ostwald law is applicable on which type of electrolyte solutions -

$\frac{1}{4}$ mark	Strong electrolyte	$\frac{1}{4}$ mark	Weak electrolyte
$\frac{1}{4}$ mark	A and B both	$\frac{1}{4}$ mark	None of them
- Freyon is -

$\frac{1}{4}$ mark	CCl_2F_2	$\frac{1}{4}$ mark	CCl_3F_3
$\frac{1}{4}$ mark	CF_4	$\frac{1}{4}$ mark	Monocline sulphur
- Which of the following is a primary alcohol?

$\frac{1}{4}$ mark	CH_3CHO	$\frac{1}{4}$ mark	C_2H_5OH
$\frac{1}{4}$ mark	$C_6H_5COCH_3$	$\frac{1}{4}$ mark	$C_6H_5CH_2CH_2OH$

Que 1 (A) Objective type questions:

- Bonding electrons in O_2^{2-} are -

(a)	4	(b)	6
(c)	8	(d)	10
- Amorphous solid is -

(a)	graphite	(b)	monocline sulphur
(c)	glass	(d)	white tin
- 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
- Freyon is -

- (a) CCl_2F_2 (b) CCl_3F_3
 (c) CF_4 (d) None of the above

5. Which compound not gives Iodoform test -

- (a) CH_3CHO (b) $\text{C}_2\text{H}_5\text{OH}$
 (c) $\text{C}_6\text{H}_5\text{COCH}_3$ (d) $\text{C}_6\text{H}_5\text{CH}_2\text{CH}_2\text{OH}$

1/2 fjdR LFkkuka dh i firz dhft , &

- 25°C lkj Tkyk ds fYk, PKw dh Ekkuk &&&&&&&& gA
- Hkktkuk Eka vk, kksMUK dh dEkh Lks &&&&&jkxk gkRkk gA
- QkEkzkfMgkbM vf/kd LkEk, k Rkd j [kk jgUks lkj &&&&&&nRkk gA
- lksUkflkfykuk dh [kktkdRkk OkSkfUkd &&&&&&&gA
- vkDLkhtkuk v.kq lkNfRk Eka &&&&&&gkRkk gA

(B) Fill in the Blanks -

- The value of PKw for water at 25°C is
- From lack of iodine in diet disease.
- Farmaldehyde converted into to keep opened for a long time.
- The penicillin was discovered by
- Oxygen molecule in nature is

lkz Uk 2- CkQj fokyk, kuk dh lkj Hkk"kk nhfTk, A , d vEYkh, k CkQj fokyk, kuk dk mnkgj .k fYkf [k, A

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

lkz Uk 3- LkEkng fOkLFkkkUk fUk, kEk D, kk gS LIK"V dhftk, A

What is Group displace law? explain it.

lkz Uk 4- DYkksjUk ds nks vkDLk vEYkka ds UkkEk Ok Lkuk fYkf [k, \

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

lkz Uk 5- gkDL Ektk EklVMZ vk, kyk vfHkfØ, kk D, kk gS

What is Hofmann's mustard oil Reaction?

lkz Uk 6- dkbz nks Tokj Ukk'kd vkskf/k; ka dk UkkEk , Oka Lkuk fYkf [k, A

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

Ikz Uk 7- , d RkRok dh BCC Lkj PKUkk gñ bLkds bdkbz LkŸk Eka fdRkUks lkj Ekk. kq gñ
 An element's Structure is BCC. How many atoms are in an unit cell of it?

Ikz Uk 8- Okdk ØEk fdLks dgrks gñ N₂ ds v. kq ds OkdkUk ØEk dh Xk. kUkk dhFTk, A
 What is bond order? Calculate the bond order of N₂ molecule.

Ikz Uk 9- , fYdYk Lkk, kUkkbM vŸj , fYdYk vkbLkks Lkk, kUkkbM Eka dkbz RkhUk vBkj fYkf[k, A
 Write any three differences between alkyl cyanide and alkyl iso-cynide.

Ikz Uk 10- jŸM, kks , ŸDVORkk ds dkbz RkhUk mlk, kŸk fYkf[k, A
 Write any three uses of radio-activity.

Ikz Uk 11- DOKFUKkæd Eka mUUK, kUk ds vk/kkj lkj vOkk"lk' khYk fOKYkŸk lknkFkZ dk v. kŸkkj KkRk
 dhFTk, A
 Determine the molecular mass of a non volatile solute with teh help of
 elevation of boiling point.

½/FkOkk½

fgEkkæd Eka vOkUkEKUk ds vk/kkj lkj vOkk"lk' khYk fOKYkŸk lknkFkZ dk v. kŸkkj KkRk
 dhFTk, A

Determine the moleculr mass of non volatile solute with the help of de-
 pression in freezing point.

Ikz Uk 12- fLk) dhFTk, fd $\Delta G = \Delta H - T\Delta S$
 Prove that $\Delta G = \Delta H - T\Delta S$

½/FkOkk½

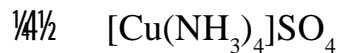
fLk) dhFTk, fd $-\Delta G = W_{non-expansion}$
 Prove that $-\Delta G = W_{non-expansion}$

Ikz Uk 13- HkkŸRkd , Oka jkLkk, kfUkd vf/k' kŸk. k Eka Pkkj vBkj fYkf[k, \\
 Write any four differences betwen physical adsorption and chemical
 adsorption.

½/FkOkk½

æOk LUksgh dksŸkkbM , Oka æOk fOkjksŸh dksŸkkbM Eka Pkkj vBkj fYkf[k, \\
 Write any four differences between Lyophilic and Lyophobic colloids.

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



15- Write the structural formulae of the following compounds -

1- Pot. ferr. (III) cyanide

2- Pot. Di cyano argentate (I)

3- Tetra Cyano Nickelate (II) ion

4- Tetra carbonyl Nickel (O)

15- Write the structural formulae of the following compounds -

1. Pot. ferr. (III) cyanide

2. Pot. Di cyano argentate (I)

3. Tetra Cyano Nickelate (II) ion

4. Tetra carbonyl Nickel (O)

16- Calculate the E° of the following cell -

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

(1) Calculate the E° of the following cell -

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

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

17- Calculate the EMF of the following cell at 298K

$Zn(s) | Zn^{2+}(aq.) || Ag^+(aq.) (1.0M) | Ag(s) (1.0M)$ $E^\circ_{Ag^+/Ag} = 0.789V, E^\circ_{Zn^{2+}/Zn} = -0.76V$

(1) Calculate the EMF of the following cell at 298K

$Zn(s) | Zn^{2+}(aq.) || Ag^+(aq.)$

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

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

Ikz Uk 16- IkfEk dksV dh vfHkfØ,kk ds fyk, nj fLFkjkd dh Xk.kUkk LkEkkdYkUk fof/k Lks dhfTk, A

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

½/FkOkk½

'kU,k dksV dh vfHkfØ,kk ds fyk, nj fLFkjkd dh Xk.kUkk LkEkkdYkUk fof/k Lks dhfTk, \

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

Ikz Uk 17- Qks/kkktQh ds fUkEuk Iknka dks LkEkÖkbb,ks&

- 1- mnHkkLkUk
- 2- MSkYkfIkzk
- 3- fLFkjhdj.k
- 4- fIkfVzk
- 5- VksUkzk ,kk jzk Lkdj.k

Explain photography on following points -

- (i) Exposure
- (ii) Developing
- (iii) Fixation
- (iv) Printing
- (v) Toning

½/FkOkk½

dKkUj Ik,kjkbVhTk Lks RkkÇkk ds fUk"d"lz k ds fUkEuk Iknka dks LkEkÖkbb,ks

- 1- v,klD dk Lkwk
- 2- v,klD dk Lkkae.k
- 3- HkTzk , Oka IkzkYkUk Iknka Eka IkzkpRk jLkk,kfUkd vfHkfØ,kk
- 4- EkS/ ds?kVd
- 5- 'kks'kUk Eka IkzkpRk ,d fof/k dk UkEk A

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

- (i) Formula of ore
- (ii) Concentration of ore
- (iii) main reactions in roasting
- (iv) component of matte
- (v) name of one method involved in purification method.

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

- 1- Formula of ore
- 2- Concentration of ore
- 3- main reactions in roasting

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

- (i) Principle
- (ii) Labelled diagram
- (iii) chemical reaction used in the process.



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

- 1- Formula of ore
- 2- Concentration of ore
- 3- main reactions in roasting

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

- (i) Principle
- (ii) Labelled diagram
- (iii) Chemical reactions used in the process.

Q19- Explain the Lab. method preparation diethyl ether in the following points-
fYk f [k, &

- 1- j k L k k , k f U k d L k E k h d j . k
- 2- U k k E k k f d R k f P k « k
- 3- f o k f / k d k L k f { k i R k O k . k z k

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

- (i) Chemical equation
- (ii) Labelled diagram
- (iii) Method in brief.

½ F i O k k ½

Q20- Explain the Lab method preparation of CH_3CHO in the following points-
fYk f [k, &

- 1- j k L k k , k f U k d L k E k h d j . k
- 2- U k k E k k f d R k f P k « k
- 3- f o k f / k d k L k f { k i R k O k . k z k A

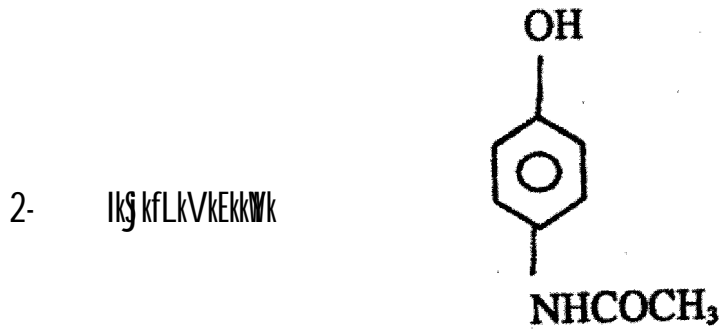
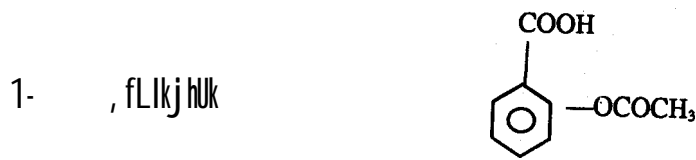
Explain the Lab method preparation of CH_3CHO in the following points-

- (i) Chemical equation
- (ii) Labelled diagram
- (iii) Method in brief.

vkn' kZ mÜkj Lk&/&Ckh

- mÜkj 1 $1\frac{1}{2}$ OkLRkqUk"B
- 1- $\frac{1}{4}n\frac{1}{2}$
 - 2- $\frac{1}{4} \frac{1}{2}$
 - 3 $\frac{1}{6}c\frac{1}{2}$
 - 4 $\frac{1}{4}n\frac{1}{2}$
 - 5 $\frac{1}{4}n\frac{1}{2}$
- $\frac{1}{6}k\frac{1}{2}$ fjDRk LFKkUk Hkjks &
- 1 14
 - 2 ?k&kkj k&k
 - 3 VRbz/kfDLkUk
 - 4 vYkDTk&Mj ¶YksEK&k
 - 5 vUk&k&kdh,k
- mÜkj 2 , Lkh n&k&Yk vEYk RkFkk mLkds YkOk.k ,kk n&k&Yk {kkj RkFkk mLkds YkOk.k fOkYk,kUk Eka Fkk&/h Ekk&kk Eka vEYk ,kk {kkj fEYkk n&ks Lks bLkds pH EkkUk Eka dkbz Ikfj OkRk&Uk Ukggha gk&kk] CkQj fOkYk,kUk dgYkkRkk g& $\frac{1}{4} \text{vd}\frac{1}{2}$
- mngkj.k ds fyk, , LkhVd vEYk Ok Lk&M,kEk , LkhV& dk fOkYk,kUk vEYkh,k CkQj dgYkkRkk g& $\frac{1}{4} \text{vd}\frac{1}{2}$
- $\frac{1}{4}$ /FkOkk vU,k LkEkd{k mngkj.k $\frac{1}{2}$
- mÜkj 3 LkEkng fOkLFkkkUk fUk,kEk & ,d α &d.k mRLkTk&Uk Lks Uk, RkRk dh vkOkRkZ Lkkj.kh Eka fLFkFRk EkYk Ikj Ekk.kq Lks nks LFKkUk Ck,kh v&j RkFkk ,d β &d.k mRLkTk&Uk Lks Uk, RkRk dh fLFkFRk ,d LFKkUk nk,kha v&j gk&kk g&
- mRRkj 4 DYk&j huk ds nks vk&DLkh vEYkka ds UkkEk Ok Lk&k
- 1- gkbkk&DYk&j Lk vEYk & HClO $\frac{1}{4} \text{vd}\frac{1}{2}$
 - 2- DYk&jd vEYk && HClO_3 $\frac{1}{4} \text{vd}\frac{1}{2}$
- $\frac{1}{4}$ /FkOkk vU,k dkbz LkEkd{k UkkEk $\frac{1}{2}$
- mÜkj 5 gk&DEk&K EKLVMZ vk&ky vfhk&Ø,kk & Ik&Fk&Ed , Ekhuk dks d&k&Uk Mk,kI YQkbM v&j EkjD,k&jd DYk&j kbM ds Lk&Fk gYdk Xk&Z djUks Ikj , fLdYk vkbLk&Fk,kks

mùkj 6 Lkk, kUks/ CkURkk gš FTkLkdh Xkzk Lkj Lkka ds RkYk Tkškh gkRkh gš 1 vđ
 Tòkj Ukk'kd vkskf/k Lkwk



mRRkj 7- RkRok FTkLkdh BCC Lkj PkUkk gš bLkds bdkbz LkYk Eka nks lkj Ekk. kq gš 3 vđ

mRRkj 8 Ckzk&ØEk ,kg nks lkj Ekk. kq/ka ds CkhPk CkUks Ckzk dh LkKEF, kz dh EkkIk gš Ckzk&ØEk dks Ckzk , Oka fòlkj hrk Ckzk v. kq d{kdkka ds bYkðVRUKka ds vFKz vRkj ds : lk Eka lkfj Hkkf"krk fd, kk TkkRkk gš

Ckzk&ØEk ,kk vkCkzk&dksV $\frac{3}{4} \frac{1}{2} [Nb - Na]$ 1 vđ

Tkgkj Nb = Ckzk vk. kFòkd d{kdkka Eka bYkðVRUKka dh Lkq, kk

Na = fòlkfj Rk Ckzk vk. kFòkd d{kdkka Eka bYkðVRUKka dh Lkq, kk

N₂ v. kq ds Ckzk ØEk dh Xk. kUkk

N lkj Ekk. kq dk bYkðVRUK fòl; kl $\rightarrow 1s^2, 2s^2, 2p^3$

UkkbVst'kuk Eka Ckzk vk. kFòkd d{kdkka Eka bYkðVRUKka dh Lkq, kk $\frac{3}{4} 8$

fòljhr Ckzk vk. kFòkd d{kdkka Eka bYkðVRUKka dh Lkq, kk $\frac{3}{4} 2$

vRk% Ckzk&ØEk $\frac{3}{4} \frac{8-2}{2} \frac{3}{4} 3$,kk N \equiv N 2 vđ

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

1- ,kg TkYk Eka fòkYkšk gš 1- ,kg TkYk Eka vYIk fòkYkšk gš

2- ,kg vEYkh, k TkYk&vIk?kVUk ij 2- ,kg vEYkh, k TkYk&vIk?kVUk lkj
 dkckðDI fyd vEy rFkk vEYk RkFkk lkFkFEd , Ekhuk nBkk gš
 vEkkšUk, kk nBkk gš

- 3- $\frac{1}{2}$ kg vikiPk₃kuk Iki IkkFkFkEd , Ekhuk 3- $\frac{1}{2}$ kg vikiPk₃kuk Iki f}Rkh₃kd , Ekhuk
 OkukRkk gA OkukRkk gA
 $\frac{1}{2}$ FkOkk vU₃k dkbZ LkEd{k vRk₃½ Ikk₃kd Lkgh mUkj Iki 1]1]1 vad
- mRRkj 10 jSM₃kks , fDVORkk ds Rkhuk mIk₃kkk fUkEukFYkf[kRk gA
- 1- Nf"K Eka & jSM₃kks , fDVOR LkEKLfkkfUkdka dh Lkg₃kRkk Lks IkkSkka }kjk mOkj d Xkg.k
 djUks dh nj RkFkk vUkd jkSkka dk v/₃k₃kuk fd₃kk TkkRkk gA
- 2- fPkfdRLkk ds {kSk Eka & dI j ds mIkPkj Eka dkkSkYV & 06 Lks IkkIRk γ & fOkfdj . kka
 dk mIk₃kkk djRks gA jSM₃kks QkLQkj Lk (P-32) ds }kjk Y₃kdSEk₃kk jDRk dLkj
 ROKPk ds jkSkka RkFkk vU₃k ROKPk LkSkkh jkSkka dk mIkPkj fd₃kk TkkRkk gA
- 3- [kfUTkka RkFkk PkêkUkka dh vk₃q dk fUk/kkj . k & HkU&XkHkZ 'kkL«k ds v/₃k₃kuk Eka RkFkk
 Xkgka ds v/₃k₃kuk Eka [kfUTkka RkFkk PkêkUkka dh vk₃q dk vR₃kBk EkgROkIkwkZ gkRkk gA
 bLkds fYk, jSM₃kks , fDVORkk mIk₃kkk gA
- mUkj 11- $\frac{1}{2}$ FkOkk vU₃k dkbZ LkEd{k mIk₃kkk½ Ikk₃kd Lkgh mIk₃kkk Iki 1]1]1 vad A
 fdLkh æOk Eka vOkk"ik' khYk fOkYkSk fEYkkUks Iki bLkdk Okk"lknkCk dEk gkRkk gSA bLk
 dkj . k fOkYk₃kuk 'kq' fOkYk₃kd Lks vf/kd RkkIkØEk Iki mOkYRkk gA
 fOkYk₃kuk RkFkk 'kq' fOkYk₃kd ds DOKfUkkad Eka vRkj dks fOkYk₃kd ds DOKfUkkad Eka
 mUk₃kuk dgRks gA bLks ΔT_b Lks n'kkRks gA
 Ekkuk 'kq' fOkYk₃kd dk DOKfUkkad T_1 gS RkFkk fOkYk₃kuk dk DOKfUkkad T_2 gS A
 DOKfUkkad Eka mUk₃kuk $\Delta T_b \propto T_2 - T_1$ gkSkk A
 fdLkh Okk"ik' khYk IknkFkZ dks TkYk Eka ?kYkUks Iki DOKfUkkad Eka Okf) æOk ds Okk"lknkCk
 Eka vOkUkEuk ds LkEkkUkkRkkh gkRkh gA

$$\Delta T_b \propto \Delta p$$

YkfdUk $\Delta p \propto m \frac{1}{2} k v^2$

$$\Delta p \propto \Delta T_b \propto m \dots\dots(i)$$

$$\Delta T_b \propto m \dots\dots(ii)$$

vFkkRk DOKfUkkad Eka mUk₃kuk fOkYk₃kuk dh EkkykYkRkk ds LkEkkUkkRkkh gkRkk gA
 \therefore 1000 xte foyk; d ea $\frac{w \times 1000}{w}$ xte foyk

$$\text{eksyyrk } \frac{w \times 1000}{w \times \text{foys dk v.kkkj}}$$

$$\frac{3}{4} \Delta T_b \propto \frac{w \times 1000}{w \times m} \dots\dots(iii)$$

LkEkhdj .k (ii) Eka EkkykYkRkk m dk Ekkuk j [kUks lkj]

$$\text{vFkOkk} \quad \Delta T_b = \frac{1000 \times K_b \times w}{mw} \dots\dots(iv)$$

$$m = \frac{1000 \times K_b \times w}{\Delta T_b \cdot w} \dots\dots(v)$$

bLk Lkwk Eka ?kfykRk lknkFkZ dk v.kkkj Kkrk dj YkRks gA

lkr ,kd Lkgh lkn lkj 1]1]1 vad

1/2 vFkOkk/2

fdLkh fokyk ,kuk dsfgEkkad dk vOkUkEkUk] fokyk ,kuk dh EkkykYkRkk ds LkEkUkKkRkKh gkRkk gA

$$\Delta T_p \propto m$$

$$\text{,kk} \quad \Delta T_f = k_f \cdot m \dots\dots(i)$$

kf 3/4 EkkykYk fgEkkad vOkUkEkUk fLFkjkd]

; fn m 3/4 1 rks $\Delta T_f = k_f$

vFkkr fdl h foy; u dk esyd fgkd voueu fLFkjkd] fokyk ,kd dsfgEkkad Eka gPZ mLk dEkh ds CkjKckj gS Tkks , d Ekkyk vOkk"lk' khyk fokyksk dks 100 XkEk fokyk ,kd Eka ?kkykUks lkj lkrRk gkRkh gA

∴ 1000 xte foyk; d ea $\frac{w \times 1000}{w}$ xte foyS gA

$$\text{eksyyrk } \frac{3}{4} \frac{1000 \text{ XkEk fokyk ,kd Eka fokyksk dk Hkkj}}{\text{foys dk v.kkkj}}$$

$$; k \frac{3}{4} \frac{\text{foys dk Hkkj}}{\text{foys dk v.kkkj}} \times \frac{1000}{\text{fokyk ,kd dk XkEkka Eka Hkkj}}$$

$$\text{eksyyrk } \frac{3}{4} \frac{w \times 1000}{w \times m}$$

$$m = \frac{w \times 100}{w \times m}$$

Likhdj .k (i) Eka EkkYkYkRkk m dk Ekkuk j [kukS lkj]

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

vFkOkk $m = \frac{1000Kfw}{\Delta Tfw}$ lkr, kd Lkgh lkj 1]1]1 vrd

bLk Lkuk dh Lkgk, kRkk Lks ΔTf KkRk gkSkS lkj vOkk'lk' khYk lknkFkz dk v.kkjkj m KkRk dj LkdRks gA

mRRkj 12

fl) djuk gS $\Delta G = \Delta H - T\Delta S$

fdl h fudk; dh eDr Atkz Atkz dh og ek=k gS tksvf/kdre mi ; ksh dk; l eafjofr gsh gseDr Atkzdseku dksLFkj rki , oankc ij ifjdfyr djrs gseDr Atkz dks fuEkuq kj l sfjdfyr djrs gS

$$G = H - TS \quad \dots(i)$$

pfid] $H = E + PV$

$$G = E + PV - TS$$

eDr Atkz voLFkk Qyu gS 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 Atkz ifjorU dsl e; rki , oankc fLFkj gsh rc

$$T = \text{fLFkj}] \quad S\Delta T = 0$$

$$P = \text{fLFkj}] \quad V\Delta P = 0$$

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

pfid $\Delta H = \Delta E + P\Delta V]$ $\Delta H =$, Ufkyih ifjorU

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

bl sgh fxcI gYegkSVt l ehdj .k dgrs gA

1/2vFkok1/2

ΔG fdLkh jkLkk, kfukd vfHkfØ, kk dh LkRk% lkkfRkRkk dh Ekrk gS Å"EkKkFRk ds lkFkEk fuk, kek Lks $\Delta E = q + w$

$$q = \text{Rkak } \}kj k \text{ vOk' kks'kRk m"EkK}$$

$$\Delta E = \text{vkrkfjd } \hat{A}Tkkz \text{ kfj } \text{OkRkZk}$$

$$w = \text{Rkæk } \text{Ikj } \text{fd}_{,kk} \text{ Xk}_{,kk} \text{ dk}_{,kz} \text{ g\AA}$$

fn gEka fdLkh Rkæk }jk fd_{,ks} Xk_{,ks} dk_{,kz} dh Xk. kUkk djUkh gks Rkks w ds LFkkuk Ikj &w YkSkk IkM\kk vRk%

$$\Delta E = q - w$$

$$q = \Delta E + w$$

Rkæk }jk fd_{,kk} Xk_{,kk} dk_{,kz} w IkLkkj dk_{,kz} vksj vIkLkkj dk_{,kz} nkSkka dk_{,kk} gSA vIkLkkLkj dk_{,kz} ds mlk_{,kk} dk_{,kz} ds : Ik Eka Ikz kPRk fd_{,kk} Tkk LkdRkk g\AA mLks vnkCk vk_{,kRkuk} dk_{,kz} mlk_{,kk} dk_{,kz} dgRks g\AA

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

$$\text{Ikj Rkq } w_{\text{exp}} = p\Delta V \text{ vLFkj nkCk Ikj } \frac{1}{2}$$

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

fLFkj nkCk Ikj , Ufk\Ikh kfj OkRkZk

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

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

fLFkj Rkklk Ikj mRØEk. kh_{,k} IkØEk ds fYk,

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

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

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

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

$$\Delta H - T\Delta S = \Delta G \text{ vLFkj Rkklk , Oka nkCk Ikj } \frac{1}{2}$$

$$\text{vRk\% } \Delta G = w_{\text{non exp}}$$

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

mRRkj 13

HkSRkd vf/k' kSk. k &

- 1- bLkEka vf/k' kSk. k vksj vfHk' kSk. k ds CkPk d. Mj dYTk vkd"zk nqkZk HkSRkd CkYk YkXkRkk g\AA Tkks vR_{,kRk} nqkZk CkYk gkRkk g\AA

jLkk_{,kfUkd} vf/k' kSk. k &

- 1- bLkEka vf/k' kSk. k vksj vfHk' kSk. k ds CkPk jkLkk_{,kfUkd} CkYk CkURks gS vksj mUkdS CkPk IkEYk jkLkk_{,kfUkd} CkYk YkXkRkk

- | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>2- $vf/k'kk\dot{s}.k m''Ekk dk Ekkuk \frac{1}{20} I s$
$40kj/mol^{-1}\frac{1}{2}dEk gk\dot{R}kk g\dot{A}$</p> <p>3- $\dot{s}kg mR\dot{O}Ek.kh,\dot{s}k g\dot{A}$</p> <p>4- $\dot{s}kg RkRdkYk gk\dot{R}ks OkYk\dot{k} Ik\dot{O}Ek g\dot{A}$</p> | <p>2- $vf/k'kk\dot{s}.k m''Ekk dk Ekkuk \frac{1}{20}$
$I s 40kj/mol^{-1}\frac{1}{2} vf/kd gk\dot{R}kk$
$g\dot{A}$</p> <p>3- $\dot{s}kg vUk\dot{R}\dot{O}Ek.kh,\dot{s}k Ik\dot{O}Ek g\dot{A}$</p> <p>4- $bLkdk Ok\dot{R}k vf/k'kk\dot{s}.k , Ok\dot{a}$
$vf/k'kk\dot{s}.k dsLkOkHkkOk Ikj fukHkj$
$djRkk gSEkm \dot{s}kk RkhOkz gksLkdRkk$
$g\dot{A}$</p> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

$\frac{1}{2}vFtok\frac{1}{2}$

æOk LUKsh dkYkkgMYk &

- 1- $fOkYk\dot{s}k dks fOkYk\dot{s}kd Eka ?kk\dot{Y}kUks$ 1-
 $Ikj OkURkk g\dot{A}$
- 2- $\dot{s}ks LFkk,\dot{kh} gk\dot{R}ks gS buKds LFkk,\dot{kh}dj .k$ 2-
 $ds fYk, LFkk,\dot{kh}dkj d IknkFkZ fEKYk\dot{R}ks$
 $dh vkOk',kdRkk Ukgha gk\dot{R}kh g\dot{A}$
- 3- $bLkds LdUnUk ds fYk, fOk | \dot{R}k$ 3-
 $vIk?kV\dot{z} dh vf/kd Ekk\llk dh$
 $vkOk',kdRkk gk\dot{R}kh gS$
- 4- $dk\dot{Y}kkbMYkh fOkYk,\dot{k}Ukka ds d.kka ds$ 4-
 $LkkFk vf/kdRkk Eka fOkYk\dot{s}kd TkYk$
 $ds d.k Tk\dot{Y}ks jgRks g\dot{A}$

æOk fOkjks'kh dk\dot{Y}kkbMYk &

- 1- $bUkdks OkURks ds fYk, fOk'k\dot{s}k fOkf/k,\dot{k}kj$
 $vIkUkkUk IkMRkh g\dot{A}$
- 2- $bUkdks OkURks LkEk,\dot{k} buKEka LFkk,\dot{kh}dkj d$
 $IkknkFkZ fEKYk\dot{R}kk TkRkk g\dot{A} \dot{s}ks vR,\dot{k}Rk$
 $vLFkk,\dot{kh} gk\dot{R}ks g\dot{A}$
- 3- $fOk | \dot{R}k vIk?kV\dot{z} dh vR,\dot{k}Rk dEk Ekk\llk$
 $Hkh buGa LIk\dot{a}nRk dj n\dot{R}kh g\dot{A}$
- 4- $bUk dk\dot{Y}kkbMYh fOkYk,\dot{k}Ukka ds d.k ds$
 $LkkFk fOkYk\dot{s}kd ds d.k Tk\dot{Y}ks Ukgha gk\dot{R}ks$
 $g\dot{A}$

mUkj 14-

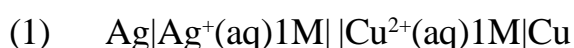
- 1- $Ik\dot{s}/\dot{s}'k,\dot{k}Ek gDLkk Lkk,\dot{k}ukQj\dot{s}/ II$
- 2- $gDLkk , EkhUk dk\dot{s}kYV III \dot{Y}kj kbM$
- 3- $DYkj kbM$ 3- $Ik\dot{s}/\dot{s}'k,\dot{k}Ek V\dot{s}/R vk,\dot{k}k\dot{M}/kEkj D,\dot{k}j\dot{s}/ II$
- 4- $V\dot{s}/R , EkhUk dk\dot{M}kj II LKYQ\dot{s}/$

$\frac{1}{2}vFtok\frac{1}{2}$

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



mRRkj 15-



$$E^\circ = E_{Cu^{2+}/Cu} - E_{Ag^+/Ag}$$

$$E^\circ = 0.34 - (-0.80)$$

$$E^\circ = 1.14V$$

dFkkM - Ag , UkkM - Cu

¼1 HkkXk lkj 2 v d ½

½2 js HkkXk lkj 3 v d ½

½½

XkSOkSkh LkSk &

fok | Bk vIk?kVUkh LkSk

1- bLkEka j Lkk, kfUkd ÅTKkZ dk fok | Bk Eka lkfj OkRkZk gkRkk gS

1- bLkEka fok | Bk ÅTKkZ dk j Lkk, kfUkd ÅTKkZ Eka lkfj OkRkZk gkRkk gS

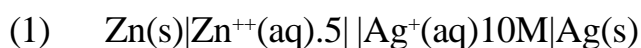
2- bLkEka Cathode (+) RkFkk Anode (-) /kqk gkRkk gS

2- bLkEka Cathode (-) RkFkk Anode (+) /kqk gkRkk gS

3- bLkEka nksBkka electrodes vYkXk & vYkXk fokYk, kuk Eka Moks j gRks gS mnkgj .k&Mok, kYk LkSk

3- bLkEka nksBkka electrodes , d gh fokYk, kuk Eka Moks j gRks gS mnkgj .k &UkYLkuk LkSk

¼vFlk½



dk 298K ij EMF dh x.kuk

$$(E^\circ Ag = 0.789, E^\circ Zn = -0.760)$$

gy & l y foHko dk l ehdj .k&

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

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

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

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

$$E_{\text{cell}} = 1.634V$$

1/2 i kFkfed I sy , oaf}rh; d I sy ean ks varj

i kFkfed LkYk &

1- i kFkfed I sy , d ckj mi ; ksx ds ckn i q% vkof' kr ugha fd; k tk I drk gA

2- jkl k; fud vfHkfØ; k døy , d fn'kk ea gks'h gA

f}rh; d I sy

1- f}rh; d I sy dks mi ; ksx ds ckn i q% vkof' kr fd; k tk I drk gA

2- jkl k; fud vfHkfØ; k nksjka fn'kk ea gks'h gA

mÜkj 16-

IkFKEk dksV dh vfHkfØ,kk ds fYk,ks nj fLFkjkd dk fuk/kkj .k LKEKkdYkuk dh fof/k }kj k½

, d LkEKKU,k vfHkfØ,kk I kj fofPkkj djUks I kj

$$A \rightarrow fØ,kk QYk$$

$$A \quad a_{gm M/L}$$

; fn t = T, rc

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

æO,kkUkqkkRkh fØ,kk ds fuk,kEkkUkqkkj

^vfHkd kj d dh vfHkfØ,kk dh Xkfrk mLkds LkfØ,k Ekk«kk ds LkEkkUkqkkRkh gkRkk gA**

$$\text{VRk\%} \quad \frac{dx}{dt} \propto (a - x) \quad \dots\dots(i)$$

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

Ik{kRkj djUks I kj

$$\frac{dx}{(a - x)} = K dt \quad \dots\dots(iii)$$

LkEkkdYkuk djUks I kj

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

$$\ln(a - x) = Kt + I_0 \quad \dots\dots(v)$$

$$\text{for } x = 0, t = 0 \quad \dots\dots(vi)$$

Likewise (v) and (vi) is I_0 and I [kals lkj]

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

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

likewise [kals lkj]

Utkaly Yk Ykly dks Lkekku, k Ykly Eka lkj Okly Lks

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

muj 16

'k, kdsv dh vfhf, kd ds fy, vfhf, kd dh nj vfhfkd kd ds Lkæ. k ds 'k, k ?kRk ds Lkekukgh gkks gA

vfhf, kd R → Prodc. Eka

$$nj \quad \frac{-d[R]}{dt} = k[R]^0 \quad \dots(i)$$

$$nj \quad \frac{-d[R]}{dt} = k \times 1 \quad \text{D, kd } [R]^0 = 1$$

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

nkka vkj dk Lkekdyuk [kals lkj]

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

tc $t = 0$ gRk [R] = $[R]_0$ $\frac{1}{R_0}$ vfhfkd kd lkj fhkd Lkæ. k

; s Ekkuk Lkekhdj. k (iii) Eka j [kals lkj]

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

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

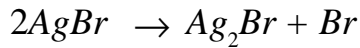
Lkekhdj. k (iii) vkj (v) Lks

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

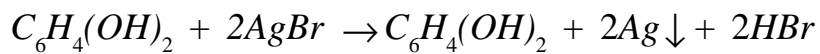
$$K = \frac{[R]_0 - [R]}{t}$$

mRrj 17 **Qk/kkkQh ds lkn &**

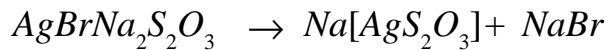
- 1- **mnHkkLkuk & dskjs ds Ykk dks OkLRq Ij dæRk dj dñ Lkd. M ds fyk, Ikdk'k MkYRks gS bLks mnHkkLkuk dkYk dgrks gA bLkLks OkLRq dk fPk«k IYk/ Ij vk TkkRk gA**



- 2- **MSkYkfkak djukk & fdOkkkyk] IkkbjkkykYk gkbMRSDOkkSk ,kk fEkMkYk dk {kjh, k ?kkyk MSkYk Ij gRk gS Tkksfd AgBr ds Ag Eka vIkPk, kuk dks IkwkZ dj nRk gS bLkLks fUkXkSVok IkkIRk gRk gA**

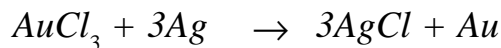


- 3- **fLFkjhdj .k & LkSM, kEk Fk, kLKYQ/ ½gkbIkks fOkYk, kuk dk mlk, kkk fUkXkSVok ds fLFkjhdj .k gRkfd, kk TkkRk gS vIkZkDRk AgBr gkbIkks Eka ?kYkdj vYkXk gks TkkRk gA**



- 4- **fIkVXk & fIkVXk Iksj Ij fUkXkSVok ds }kj k Ikdk'k MkYkdj dñ LkE, k ds fyk, j [kk TkkRk gS fTkLkLks Iksj Ij OkLRq dh Lkgh fPk«k vIdRk gks TkkRk gS fIkVXk Iksj Ij AgCl fTKYk/huk dk Ysk gRk gA bLks /kksdj Lk[kk YkRks gA**

- 5- **Vksukkk ,kk jkk Lkdj .k & dkYks LkQn fPk«k dks PkEdhYk CkUkLks gRk AgCl₃ dk fOkYk, kuk mlk, kkk fd, kk TkkRk gS fTkLks Vksukkk dgrks gA**

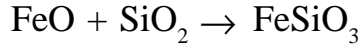
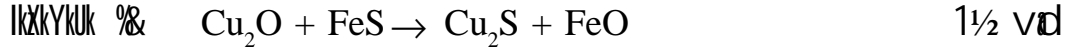
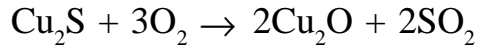
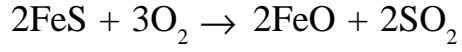


½vFkok½

- 1- **v; Ld dk I# %& dkWj IkkbjkVhTk Cu₂S.Fe₂S₃ ,kk CuFeS₂ 1 vad**
- 2- **v, kLd dk Lkæ. k %& dkWj ds LkYQkbM v, kLd dk Lkæ. k Qsk mRiYkkOkuk fOkf/k Lks fd, kk TkkRk gA IkhLks gq v, kLd CuFeS₂ dks IkkUk Lks Hkjs gkT'k Eka MkYk fn, kk TkkRk gS RkRkÜPkkRk PkM ,kk ,kdkSYkIVek dk RkYk MkYkdj Okk, kq dh RkYk /kjk IkkkfgRk djUks Ij v, kLd ÖkXk ds ÅIj RkRk gA fTkLks vYkXk dj fyk, kk TkkRk gS vksj v' kq) ,kka UkhPkS CkB TkkRk gS bukdks vYkXk dj fyk, kk TkkRk gA**

1 vad

- 3- **HkTkk %& 2CuFeS₂ + O₂ → Cu₂S + 2FeS + SO₂**



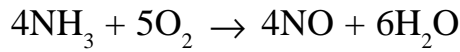
4- एक्स/ दस ? क्वद ड, क्वक लक्यकबम रकफक क्ज लक लक्यकबम ग्वा 1 वंद]
 (Cu₂S + FeS)

5- ' क्कस/कु एका लक क्कडरक , द फकफ/क फक | क्क वक?कवुक ग्वा वफकक वु,क लकेकद{क फकफ/क दक उकेक 1/2 वंद

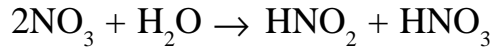
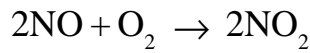
mUkj 18

वक.वकक्यम फकफ/क लक उककbfV'द वEYk दस फुकेकक क दक flk) कक

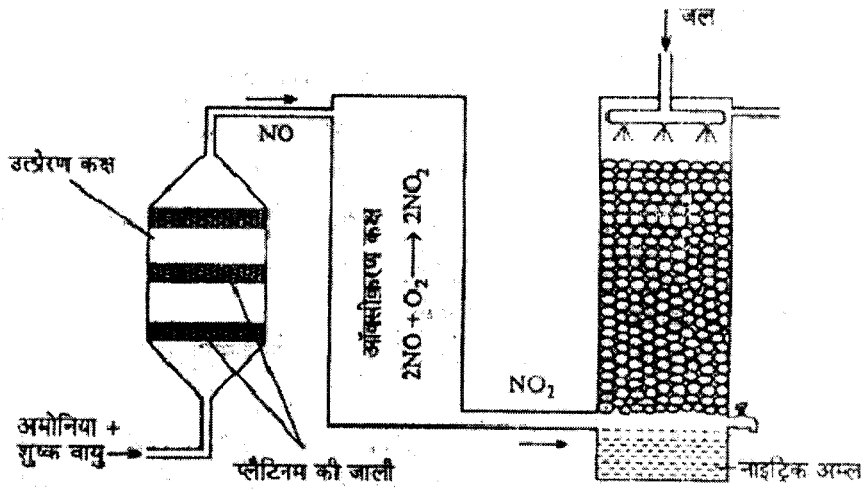
1 वक, ककुक वEककु, कक वक 8 वक, ककुक कक, क्क दक फEक.क Pt दह ककक्यक दस Åक 800 808°C रकक लक लककfgरक fd, कक कककक गस रकक 90 कक' कक वEककु, कक दक उककbfV'द वकDLककबम एका वकDLकhdj. क गक कककक ग्वा



ककक फEकककुस लक उककbfV'द वEYk कककक ग्वा



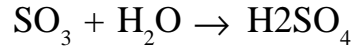
उकेककदरक फकक %



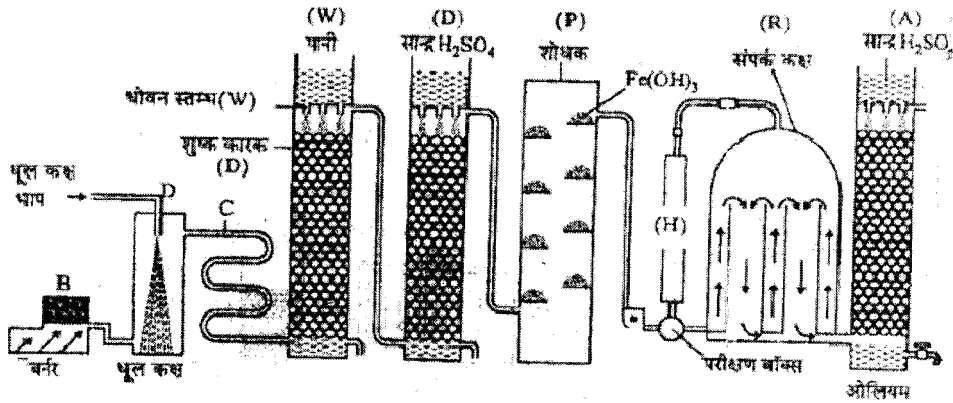
1/2 वंद

H₂SO₄ ds LkdkdZ d{k fdkf/k dk fLk) kRk &

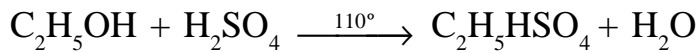
'kq) , Oka 'kqd SO₂ RkFkk Okk,q ds fEkJ. k dks mRlkj d v₂O₅ lkj lkdkkfgRk dj Uks Lks Okg SO₃ Eka vkDLkhNRk gks TkRkk gS Tkks TKYk Lks fØ₃kk dj ds H₂SO₄ CkUkRkk gS



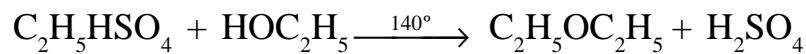
UkkekfdRk j[kfkPk«k



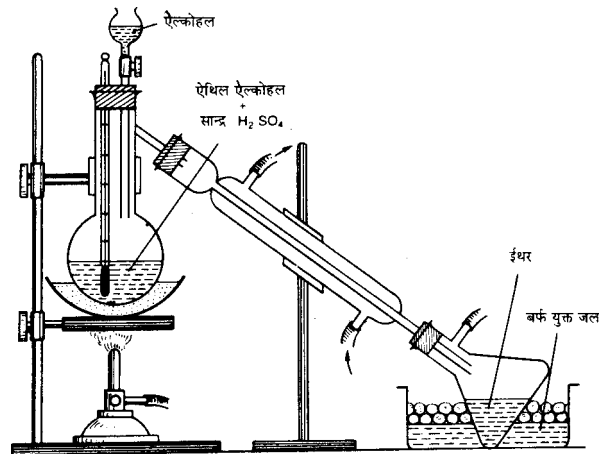
mUkj 19- 1/1 1/2 lkdkk'kkyk Eka Mkb, fFkyk bFkj CkUkUks dh fdkf/k dk jLk,kfUkd I ehdj .k



, fFkyk vYdkgyk



1/2 1/2 UkkekfdRk fPk«k &

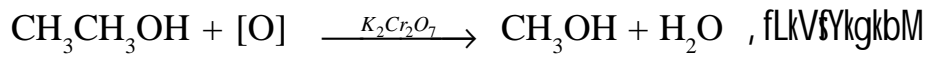


1/2 1/2 fdkf/k dk LkdkkRk Ok. kZk & vkLkOkUk 1YkLd Eka 100ml lkfj 'kq) C₂H₅OH , Oka 50ml Lkkae H₂SO₄ Ykdj CkYkw Å"Ekd lkj XkjEk dj Rks gS Rkkk 140°C lkj j [kk

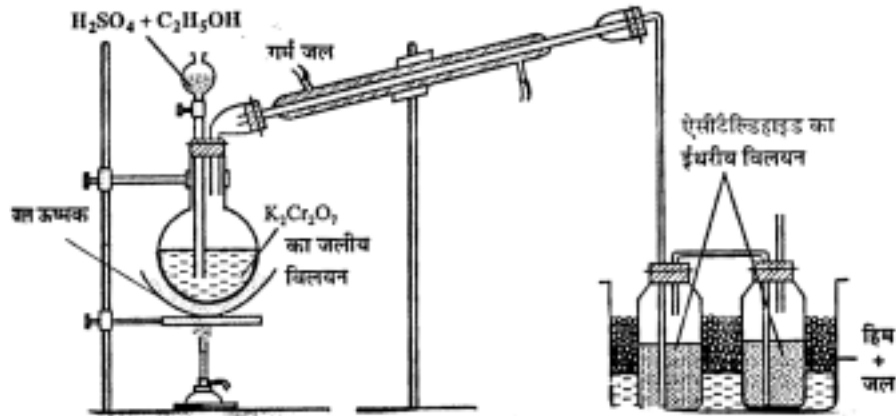
TKRkk gSA CkQZ fEKYks TKYk Lks j [ks gq Xkkgh FYkkLd Eka bFkj , d«k dj fYk,kk TKRkk gA

¼/FkOkk½

¼½ , fLkVfYMgkbM fUkEkZ k ds fYk, jkLkk, kfUkd LkEkhdj .k&



¼½ UKkEkKfjRk fPk«k &



¼½ fof/k dk I f{kr o.kU %&

25gm $\text{K}_2\text{Cr}_2\text{O}_7$ dks 100ml TKYk Eka?kkYkdj , d XkkYk Ikanh ds FYkkLd Eka YkRks gA fCkanpdkjh dhik Eka 35ml, $\text{C}_2\text{H}_5\text{OH}$ RkFkk 20ml cmc H_2SO_4 dk fEkJ.k Ykdj FYkkLd dks TKYk m"Ekd Ikj FkkMk XkEkZ djRks gA CkUkh Ok"lk Lkafkj«k ¼KkEkZ½ Lks XkqkjRkh gS CH_3CHO dh Ok"lk BAs dkkhdYk FYkkLd Eka Lkafkj«k gkdj bFkj.h.k fOYk, kuk CkUk YkRkh gS bLksRkUq H_2SO_4 ds LkFk vkLkFkRk djUksLks'k) , LkVfYMgkbM IkkIRk gkRkk gA ¼2½2½ v«½

Set - C

gkbz Ldwy I VhfQdV i jh{k
High School Certificate Examination
I fiy&izu i=
SAMPLE PAPER

fo"k; % (Subject) - j l k; u
d{k % (Class) - 12oha

I e; 3 ?k.Vk (Time- 3 Hrs)
i vkkid 75 (M.M.)

(Instruction) & Vfun{k

- 1- I Hkh izu gy djuk vfuok; ZgSA
Attempt all the Question
- 2- izu Øekad 01 ea 10 v d fu/kkzjr gSA nks dky [k.M gSA [k.M ^v** ea 05
cgfodYih; izu rFkk [k.M ^c** ea 05 fjDr LFkkuka dh i firZ vFkok mfp
I cdk tksM, A iR; d izu dsfy, 1 v d vkcivR gSA
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- izu Øekad 02 I situ Øekad 06 rd vfr y?kqRrjh; izu gSA iR; d izu
ij 02 v d vkcivR gSA mRrj dh vf/kdre 'kCn I hek 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- izu Øekad 07 I situ Øekad 10 rd y?kqRrjh; izu gSA iR; d izu ij 03
v d vkcivR gSA mRrj dh vf/kdre 'kCn I hek 50 'kCn A
Q. No. 07 to 10 are short answer type question & it carries 03 marks
each. Word limit is maximum 50.
- 5- izu Øekad 11 I situ Øekad 14 rd y?kqRrjh; izu gSA iR; d izu ea
vkrfjd fodYi gsvk iR; d izu ij 04 v d vkcivR gSA mRrj dh vf/kdre
'kCn I hek 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- izu Øekad 18 I s izu Øekad 19 rd nh?kzmRrjh; izu gSA iR; d izu ea
vkrfjd fodYi gSvkj iR; d izu ij 06 vd vkafVr gSA mRrj dh vf/kdre
'kCn I hek 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.

1. $\frac{1}{2}$ C₂ $\frac{1}{2}$ O₂²⁻ &

- 1- fUkEuk Eka dks₁ vUkPkd₂ O₂ kOkgj Iknf' kRk dj Rkk g&
 $\frac{1}{2}$ C₂ $\frac{1}{2}$ O₂²⁻
 $\frac{1}{2}$ O₂⁺⁺ $\frac{1}{2}$ O₂⁻
- 2- fUkEukfYkf [kRk Eka Lks dks₁ LkgLk₂ Bk₁ Eka TkYkd fCkq gkRkk g&
 $\frac{1}{2}$ v.kq $\frac{1}{2}$ /kukk₁ kuk
 $\frac{1}{2}$ __.kk₁ kuk $\frac{1}{2}$ IjEkk.kq A
- 3- fdLkdk TkYk₁ fOkYk₁ {kkj₁ gkRkk g&
 $\frac{1}{2}$ HOCl $\frac{1}{2}$ NaHSO₄
 $\frac{1}{2}$ NH₄NO₃ $\frac{1}{2}$ NaOCl
- 4- vEkk₁ ke vk₁ kuk g&
 $\frac{1}{2}$ Uk vEYk Uk {kkj $\frac{1}{2}$ vEYk {kkj nkBkka
 $\frac{1}{2}$, d Lk₁ vEYk $\frac{1}{2}$, d Lk₁ {kkj A
- 5- 'kh?kRkk Lks vIkP₁ gk₁ OkYkk gYkk₁ g&
 $\frac{1}{2}$ Ykk₁ Uk $\frac{1}{2}$ DYkk₁ huk
 $\frac{1}{2}$ Ck₁ huk $\frac{1}{2}$ vk₁ kuk A

Que 1 (A) Multiple choice question

1. Which one of the following shows the paramagnetic behavior -
 (a) C₂ (b) O₂²⁻
 (c) O₂⁺⁺ (d) O₂⁻
2. Which one of the following is lattice point in co-valent solid -
 (a) Molecule (b) Anion
 (c) Cation (d) Atom
3. Which aqueous solution is basic in nature -
 (a) HOCl (b) NaHSO₄
 (c) NH₄NO₃ (d) NaOCl
4. Ammonium ion is -
 (a) Neither acid nor base (b) acid and base both

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

5. Halogen which reduces immediately is -

- (a) Fluorine (b) chlorine
(c) Bromine (d) Iodine

1/2 DRK LFkkukka dh IkkRkZ dhFTk, &

- 1- DYkksj huk dh fckj jkuk fØ, kk ds fyk, &&&& mÜkj nk, kh gA
- 2- dSYLk, kEk, LkhV/ ds, d v. kq dks XkEkZ dj Uks lkj &&&& IkkIRk gkRkk gA
- 3- DYkksj Yk dk Lkkk &&&& gA
- 4- dkyRkkj ds IkkkkTkh vLkOkuk Lks IkkIRk Ek/ k Rkyk Eka &&&& mlkLFkRk 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

Ikz Uk 2- Ckksj kuk VRb jYkksj kbM YkpbLk vEYk gA D, kka

Boron trifluoride is a Lewis acid. Why?

Ikz Uk 3- jSm, kks, fDVORkk dh, Lk-vkbZ bdkbZ D, kk gA

What is S.I. unit of radio activity?

Ikz Uk 4- jYkksj huk ds vLkdkRk O, kOkkj dks LIk"V dhFTk, \

Explain the Anomalous behaviour of fluorine.

Ikz Uk 5- fEkj CkSk dk Rkyk fdLks dgRks gA bLkdk Lkkk fykf[k, \

What is oil of mirbane? Write its formula.

Ikz Uk 6- CkgYkhdj. k dks Ikfj Hkk"krk dhFTk, \

Define polymerisation.

Ikz Uk 7- kkuV Lkyk dh Ikfj Hkk"kk fykf[k, A ?kukh, k kkuV Lkyk ds ?kukRok ds fyk, Lkkk

fYkf[k, \

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

Ikz Uk 8- vKDLkhTKuk v.kq dk vkf.Okd d{kid ÅTkkz LRkj vkj\$[k CKUkkdj LIk"V dhfTk, fd vKDLkKhTKuk v.kq vUkPkKhKdh,k gkRkk gA

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

Ikz Uk 9- IkKfKfEKd] f}Rkh,kd , Oka RKRkh,k , EkhuK Eka dKbz 3 vBkj fYkf[k, \

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

Ikz Uk 10- UKKkhdh,k fkdj.k ds TksOkd [kRkjs Lks CKPkOk LkQkOk bLk Ikdkj nhfTk, fd LkRkRk-fkdLk IkKkfkRk Uk gkA

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

Ikz Uk 11- DkfkUkkad Eka mUuk,kuk ds vk/kkj Ikj vOkk"ik' khYk fOYkSk IknkFkZ dk v.kkKj KkRk dhfTk, A

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

½/FkOkk½

fgEkkad Eka vOkUkEkuk ds vk/kkj Ikj vOkk"ik' khYk fOYkSk IknkFkZ dk v.kkKj KkRk dhfTk, A

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

Ikz Uk 12- fLk) dhfTk, fd $\Delta G = \Delta H - T\Delta S$

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

½/FkOkk½

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

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

Ikz Uk 13- HkSRkd , Oka jkLk,kfUkd vf/k' kKSk.k Eka Pkkj vBkj fYkf[k, \

Write any four differences between physical adsorption and chemical

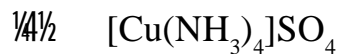
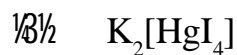
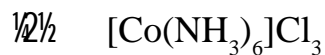
adsorption.

1/4/2022

Write any four differences between Lyophilic and Lyophobic colloids.

Write any four differences between Lyophilic and Lyophobic colloids.

Q14. Write the I.U.P.A.C. name of the following compounds.



1/4/2022

Write the structural formulae of the following compounds -

1. Pot. ferr. (III) cyanide

2. Pot. Di cyano argentate (I)

3. Tetra Cyano Nickelate (II) ion

4. Tetra carbonyl Nickel (O)

Write the structural formulae of the following compounds -

1. Pot. ferr. (III) cyanide

2. Pot. Di cyano argentate (I)

3. Tetra Cyano Nickelate (II) ion

4. Tetra carbonyl Nickel (O)

Q15. Calculate the E° of the following cell, &

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

Write any two differences between Galvanic cell and Electrolytic cell.

(1) Calculate the E° of the following cell -

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

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

1/4/2022

1/4 1/2 LkYk Zn(s) | Zn²⁺ (aq.) || Ag⁺(aq.) (1.0M) | Ag(s) (1.0M) dk 298K lkj
EMF Kkrk djks A ($E^{\circ}_{Ag^+/Ag} = 0.789V$, $E^{\circ}_{Zn^{2+}/Zn} = -0.76V$)

1/2 1/2 IkfFkEd LkYk , Oka f}Rkh,kd LkYk Eka nks vBkj fYkf [k, \

- (1) Calculate the EMF of the following cell at Zn(s) | Zn²⁺ (aq.) || Ag⁺(aq.)
10M | Ag(s) (1.0M) [Give that $E^{\circ}_{Ag^+/Ag} = 0.789V$, $E^{\circ}_{Zn^{2+}/Zn} = -0.76V$]
- (2) Write any two differences between primary and secondary cell.

Ikz Uk 16- IkfEk dksV dh vfHkFØ,kk ds fYk, nj fLFkjkd dh Xk.kukk LkEkkdYkuk fof/k Lks
dhfTk, A

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

1/4 FkOkk 1/2

'k'k dksV dh vfHkFØ,kk ds fYk, nj fLFkjkd dh Xk.kukk LkEkkdYkuk fof/k Lks
dhfTk, \

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

Ikz Uk 17- QkV/kkktQh ds fUkEuk Iknka dks LkEkÖkkb,k&

- 1- mnHkkLkuk
- 2- MSkYkfkak
- 3- fLFkjhdj .k
- 4- fLkVak
- 5- Vksukak ,kk jak Lkdj .k

Explain photography on following points -

- (i) Exposure
- (ii) Developing
- (iii) Fixation
- (iv) Printing
- (v) Toning

1/4 FkOkk 1/2

dKkjk Ikk,kjkbVhTk Lks RkkÇkk ds fUk" d"Kz k ds fUkEuk Iknka dks LkEkÖkkb,k&

- 1- v,kLd dk Lkuk

- 2- Cu_2S dk Cu_2O .
- 3- Cu_2S , Cu_2O Ikrka Eka Cu_2S j Cu_2O Cu_2S .
- 4- Cu_2S ds Cu_2O
- 5- ' Cu_2S Eka Cu_2O , d fokf/k dk UKkE A

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

- (i) Formula of ore
- (ii) Concentration of ore
- (iii) main reactions in roasting
- (iv) component of matte
- (v) name of one method involved in purification method.

18- Cu_2S Lks UKkbfVd vEYk ds fUkEkZk dks fUkEUK fCkany/ka ds vk/kkj Ij fYkf [k, &

- 1- fLk) kRk
- 2- UKkEkkfCkRk fPk«k
- 3- Cu_2S j Cu_2O Cu_2S , j

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

- (i) Principle
- (ii) Labelled diagraph
- (iii) chemical reaction used in the process.



LKY [k] d vEYk ds fUkEkZk dh LkdkZ fokf/k dk Ok. kRk fUkEUK fCkany/ka ds vk/kkj Ij dhfTk, &

- 1- fLk) kRk
- 2- UKkEkkfCkRk fPk«k
- 3- Cu_2S j Cu_2O Cu_2S , A

Explain the manufacture of Sulphuric acid from contact proces in the

following points -

- (i) Principle
- (ii) Labelled diagram
- (iii) Chemical reactions used in the process.

19- Explain the Lab. method preparation diethyl ether in the following points-
fYkf [k, &

- 1- j kLkk, kFukd LkEkdj .k
- 2- UKkEkkf dRk fPk«k
- 3- fOkf/k dk Lk{KIRk Ok. kZk

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

- (i) Chemical equation
- (ii) Labelled diagram
- (iii) Method in brief.

½/F10k½

19- Explain the Lab. method preparation of CH_3CHO in the following points-
fYkf [k, &

- 1- j kLkk, kFukd LkEkdj .k
- 2- UKkEkkf dRk fPk«k
- 3- fOkf/k dk Lk{KIRk Ok. kZk A

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

- (i) Chemical equation
- (ii) Labelled diagram
- (iii) Method in brief.

mÜkj EkkYkk Lk&Lkh

mÜkj 1 1/2 0kLRkqÜk"B

1- 1/2

2- 1/2

3 1/2

4 1/2

5 1/2

1/2 fjDRk LFKkÜk Hkjks &

1 ÜKÖKTkkRk DYkkj hÜk

2 , LkhVksu (CH₃.CO.CH₃)

3 CCl₃CHO

4 ÜkÜFKYkhÜk

5 7- 34

mÜkj 4 ÜYkksjÜk ds vLkdkRk 0,kÖkgkj dk dkj.k&

1- vfr mPp fo | Ü __.krk

2- lkjEkk.kq vkdkj Nks/k

3- mPPk bYkDVÜk ?kÜRÖk

4- d&d{kdk dh vÜkYkC/kRkk A dkbZ nks fCkq fYk[kÜks lkj &02 vÜ A

mRRkj 5 fEj CkÜk dk RkYk & ÜkkbVÜkÜkhÜk

LkÜk & C₆H₅NO₂

Lkgh ÜkkEkk fYk[kÜks lkj & 01 vÜ Lkgh LkÜk fYk[kÜks lkj &01 vÜ

mRRkj 6 CkgYkhdj.k dh lkjHkk"kk& nks,kk nks Lks vf/kd lkdkj ds EkkÜkkEj vÜkLk Eka LkÜkkÜk

dj ds CkgYkd CkÜkkRks gS Rkks mLks Lkg CkgYkhdj.k dgRks gÜ

1/2 Ük LkEkd{k lkjHkk"kk fYk[kÜks lkj &02 vÜ 1/2

mRRkj 7 ,kÜkV LkYk & fdLkh fØLVYk tkYkd dk Ük LkÜkEkkEkk HkkÜk CkgÜk Nks/h Nks/h

LkEkkÜk bdkbZkk; fTkLkdh f<kfÖkEkk Eka CkkjÜkkjRkk lkÜkj kÖkfÜk djÜks lkj LkEkkwZ fØLVYk

PkYk dk fÜkEkkZk gks TkkRkk gS mLks ,kÜkV LkYk dgRks gÜ

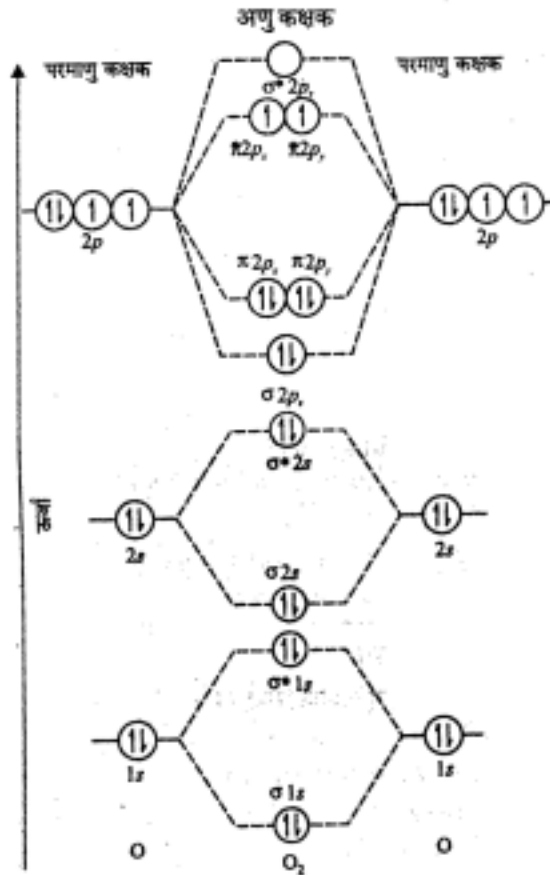
1/2 Ük LkEkd{k lkjHkk"kk fYk[kÜks lkj &03 vÜ 1/2

mRRkj 8

vkDLkhtkuk v.kq dk ÅTkkz vkjs[k

1-

vkDLkhtkuk v.kq & , d vkDLkhtkuk lkj Ekk. kq Eka 8 bYkDVrUk gkRks gñ & $1s^2, 2s^2, 2p^4$ vRk% O_2 v.kq Eka 16 bYkDVrUk gkRks vkjs mLkdk vkf. Okd d{kd vkjs[k n'kkzks vUkqkkj gkRkk A



2-

PkqCkdh, k lkaNfrk & vkDLkhtkuk v.kq ds vkf. Okd d{kdka Eka nks v, kqEXERk bYkDVrUk gkRks Lks v.kq vUkqkqkdh, k gkRkk A

¼kgh ÅTkkz vkjs[k lkj & O_2 vñ A Lkgh PkqCkdh, k lkaNfrk fyk[kuks lkj & O_1 vñ $d^{1/2}$

mRRkj 9-

, Oka dkbz vRkj fyk[k, &

Xkq k

1-

HNO_3 Lks fØ, k , YdksYk CkURRk gS UkkbVRk.kkEkhuK Bñ/s Eka UkkbVRbV + H_2 Xk&k CkURRk gS Tkks CkURRk gS Tkks XkEKZ fOUkkWk + H_2SO_4 djUks lkj UkkbVR& ds LkkFk gjk j& LkkEkhuK nRkk gS

2-

dkfCkZk , EkhuK vñlk, k n&, kPRk dkbz fØ; k ugha dkbz fØ; k ugha

3- EKLVMZ vkiYk , fYdYk vkbLkks dkbz fØ,kk Ukgha dkbz fØ,kk UkghA
 dKfCkZk , EkHUK djrk djrk
 CKUKRkk gS
 vfhkfØ,kk LkkbUkkbM
 CKUKRkk gS fTkLEka
 Lkj Lkka ds RkYk
 TkLk Xkzk gkRkk gA

mRRkj 10- Ukkfhkdh,k fOkfdj .kka ds TkSOkd [krkj&
 Ukkfhkdh,k ÅTKZ ds mlk,kkLk Lks mRIKUK LkEKL,kk dks fYk[kuks Ikj 01 vð
 LkRkRk~ fOkdkLk IkHkkfOkRk Uk gks bLk Ikj LkØkkok fYk[kuks Ikj 01 vð

mÜkj 11- fdLkh æOk Eka vOkk"ik' khYk fOkYkSk fEYkkuks Ikj bLkdK Okk"lknkCk dEk gkRkk gSA bLk
 dkj .k fOkYk,kuk 'kq) fOkYk,kd Lks vf/kd RkkikØEk Ikj mCkYkRkk gA
 fOkYk,kuk RkFkk 'kq) fOkYk,kd ds DOKFUKkAd Eka vRkj dks fOkYk,kd ds DOKFUKkAd Eka
 mUUK,kuk dgRks gA bLks ΔTb Lks n'kkRks gA
 Ekkuk 'kq) fOkYk,kd dk DOKFUKkAd T_1 gS RkFkk fOkYk,kuk dk DOKFUKkAd T_2 gS A
 DOKFUKkAd Eka mUUK,kuk $\Delta Tb \propto \frac{3}{4} T_2 - T_1$ gkLk A
 fdLkh Okk"ik' khYk lknkFkZ dks TkYk Eka ?kYkLks Ikj DOKFUKkAd Eka Okf) æOk ds Okk"lknkCk
 Eka vOkUkEkuk ds LkEkkukkkRkh gkRkh gA

$\Delta Tb \propto \Delta p$

YkSdUK $\Delta p \propto m \frac{1}{2} k v^2$

$\Delta p \propto \Delta Tb \propto m$ (i)

$\Delta Tb \propto m$ (ii)

vFkkRk DOKFUKkAd Eka mUUK,kuk fOkYk,kuk dh EkkykYkRkk ds LkEkkukkkRkh gkRkk gA
 ,kfn w XkkEk fOkYk,kd Eka w XkkEk fOkYkSk ?kYk gS

$\therefore 1000$ xte foyk; d ea $\frac{w \times 1000}{w}$ xte foyS

ekyyrk $\frac{3}{4} \frac{w \times 1000}{w \times \text{foys}}$ dk v.kkLkj

$$\Delta T_b \propto \frac{w \times 1000}{w \times m} \dots\dots(iii)$$

LkEkdj .k (ii) Eka EkkykYkRkk m dk Ekkuk j [kUks Ikj]

$$\Delta T_b = \frac{1000 \times K_b \times w}{mw} \dots\dots(iv)$$

$$m = \frac{1000 \times K_b \times w}{\Delta T_b \cdot w} \dots\dots(v)$$

bLk Lkwk Eka ?kYkRk lknkFkZ dk v.kkjkj Kkrk dj YkRks gA

lkr, kd Lkgh lkn lkj 1]1]1 vA

1/2vFkOkk/2

fdLkh foyk, kuk ds fgekkad dk vOkUEkuk] foyk, kuk dh EkkykYkRkk ds LkEkkukkkRkh gkRk gA

$$\Delta T_p \propto m$$

$$\Delta T_f = k_f \cdot m \dots\dots(i)$$

kf 3/4 EkkykYk fgekkad vOkUEkuk fLFkjka]

; fn m 3/41 rks $\Delta T_f = k_f$

vFkkz fdl h foy; u dk elyd fgekd voueu fLFkjka] foykk, kd ds fgekkad Eka gPZ mLk dEkh ds CjkCkj gS Tkks , d Ekkyk vOk"lk' khYk foykSk dks 100 XkEk foykk, kd Eka ?kkykUks lkj lktRk gkRk gA

∴ 1000 xte foyk; d ea $\frac{w \times 1000}{w}$ xte foyS gA

$$\text{eksyyrk } \frac{1000 \text{ XkEk foykk, kd Eka foykSk dk Hkkj}}{\text{foys dk v.kkjkj}}$$

$$; k \frac{\text{foys dk Hkkj}}{\text{foys dk v.kkjkj}} \times \frac{1000}{\text{foykk, kd dk XkEkka Eka Hkkj}}$$

$$\text{eksyyrk } \frac{w \times 1000}{w \times m}$$

$$m = \text{foykSk dk v.kkjkj}$$

LkEkdj .k (i) Eka EkkykYkRkk m dk Ekkuk j [kUks Ikj]

$$\Delta T_f = K_f \times \frac{w \times 100}{w \times m}$$

vFk0kk

$$m = \frac{1000Kfw}{\Delta Tfw}$$

lkr, ksd Lkgh lkj 1]1]1 vrd

bLk Lkwk dh Lkgk, kRkk Lks ΔT_f KkRk gkSkS lkj v0k'lk' khYk lknkFkz dk v. kkkkj m KkRk dj LkdRks gA

mRRkj 12

fl) djuk gS $\Delta G = \Delta H - T\Delta S$

fdl h fudk; dh eDr ΔT ΔT dh og ek=k gS tksvf/kdre mi ; ksh dk; l eafjofr gsh gseDr ΔT dseku dksfLFkj rki , oankc ij ifjdfyr djsr gseDr ΔT dks fuEukuq kj l ifjdfyr djsr gS

$$G = H - TS \quad \dots(i)$$

pfid] $H = E + PV$

$$G = E + PV - TS$$

eDr ΔT voLFkk Qyu gS 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 ΔT ifjorU dsl e; rki , oankc fLFkj gks rc

$$T = \text{fLFkj}] \quad S\Delta T = 0$$

$$P = \text{fLFkj}] \quad V\Delta P = 0$$

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

pfid $\Delta H = \Delta E + P\Delta V]$ $\Delta H =$, uFkYih ifjorU

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

bl sgh fxcI gYegkV-t l ehdj .k dgrs gA

1/2Fkok1/2

ΔG fdLkh jkLkk, kfUkd vfhkfØ, kk dh L0kRk% l0k0fRk0kk dh EkRk gS Δ "EkkXkfrk ds lkFkEk fUk, kEk Lks $\Delta E = q + w$

$$q = \text{Rk\textcircled{a}k } \}kj k \text{ v0k' kks"krk m"Ek}$$

$$\Delta E = \text{vkrkfjd } \Delta T \text{ kZ lkfj 0kRk0k}$$

$$w = \text{Rk\textcircled{a}k lkj fd, kk Xk, kk dk, kZ gA}$$

ΔE = q - w

$$q = \Delta E + w$$

ΔE = ΔE + w_{exp} + w_{non exp}

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

$$w_{\text{exp}} = p\Delta V$$

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

ΔE + pΔV = ΔH

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

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

ΔS = q_{rev} / T

$$\Delta S = \frac{q_{\text{rev}}}{T}$$

$$q_{\text{rev}} = T\Delta S$$

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

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

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

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

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

mRRkj 13

HkkSRkd vf/k' kksk.k &

jLkk, kfUkd vf/k' kksk.k &

1- bLkEka vf/k' kksk.k vksj vfHk' kksk.k ds CkhPk d.Mj dYTk vkd"Kz k nqkZk HkkSRkd CkYk YkXkRkk gA Tkks vR, kRk nqkZk CkYk gkRkk gA

1- bLkEka vf/k' kksk.k vksj vfHk' kksk.k ds CkhPk jLkk, kfUkd CkYk CkURks gs vksj mUkds CkhPk HkkSRkd jLkk, kfUkd CkYk YkXkRkk gA

2- vf/k' kksk.k m"EkK dk EkkUK 1/20 I s

2- vf/k' kksk.k m"EkK dk EkkUK 1/20

40 kJ/mol⁻¹ dEk gkRkk gA

- 3- 3 kg mRØEk.kh.k gA
- 4- 3 kg RkRdkYk gkRks ØkYkk IkØEk gA

I s 40 kJ/mol⁻¹ vf/kd gkRkk gA

- 3- 3 kg vUkØEk.kh.k IkØEk gA
- 4- bLkdk ØkRk vf/k'kkSk.k , Øka vf/k'kkSk.k dsLØkHkkØk Ikj fUkHkj djRkk gSEkm ,kk RkØkz gksLkdRkk gA

¼/Fkok½

æOk LUKgh dkYkkGMYk &

- 1- fØYkSk dks fØYkk,kd Eka ?kkykUks Ikj ØkURkk gA
- 2- 3 ks LFkk,kh gkRks gS buKds LFkk,khdj .k ds fYk, LFkk,khdj d lknkFkZ fEYkkUks dh vkØ' ,kdRkk Ukgha gkRkh gA
- 3- bLkds LdUnUk ds fYk, fØ | Øk vik?kV; dh vf/kd Ekk«kk dh vkØ' ,kdRkk gkRkh gS
- 4- dkYkkbMYkh fØYk,kUkka ds d.kka ds LkkFk vf/kdRkk Eka fØYkk,kd TkYk ds d.k TkYs jgRks gA

æOk fØjks'kh dkYkkbMYk &

- 1- buKdks ØkURkk ds fYk, fØ' kSk fØf/k,kkj vIkUkkUk IkMRkh gA
- 2- buKds ØkURRks LkEk,k buKEka LFkk,khdj d lknkFkZ fEYkk,kk TkRkk gA 3- ks vR,kRk vLFkk,kh gkRks gA
- 3- fØ | Øk vik?kV; dh vR,kRk dEk Ekk«kk Hkh buga LIkñRk dj nRkh gA
- 4- buK dkYkkbMh fØYk,kUkka ds d.k ds LkkFk fØYkk,kd ds d.k TkYs Ukgha gkRks gA

mÙkj 14-

- 1- Ikks/S'k,kEk gDLkk Lkk,kukQjV II
- 2- gDLkk , EkhUk dkskYV III ¶Ykj kbM
- 3- DYkj kbM 3- Ikks/S'k,kEk Vv/R vk,kk/kkEkj D,kjV II
- 4- Vv/R , EkhUk dkWkj II LkYQV

¼/Fkok½

- 1- K₃[Fe(CN)₆]^{III}
- 2 K[Ag(CN)₂]^{III}
- 3 [Ni(CN)₄]

4 [Ni(CO)₄]
 mRRkj 15- (1) Ag|Ag⁺(aq)1M||Cu²⁺(aq)1M|Cu

$$E^\circ = E_{\text{Cu}^{2+}/\text{Cu}} - E_{\text{Ag}^+/\text{Ag}}$$

$$E^\circ = 0.34 - (-0.80)$$

$$E^\circ = 1.14\text{V}$$

dFkkM - Ag , UkkM - Cu

¼1 HkkXk lkj 2 v d ½

½2 js HkkXk lkj 3 v d ½

½½

XkSOkSkh LkYk &

fok | qk vIk?kVUkh LkYk

1- bLkEka j Lkk, kfUkd ÅTkKz dk fok | qk
 Eka lkfj OkRkZk gkRkk gS

1- bLkEka fok | qk ÅTkKz dk
 j kLkk, kfUkd ÅTkKz Eka lkfj OkRkZk
 gkRkk gS

2- bLkEka Cathode (+) RkFkk
 Anode (-) /kqk gkRkk gS

2- bLkEka Cathode (-) RkFkk
 Anode (+) /kqk gkRkk gS

3- bLkEka nksBkka electrodes vYkXk &
 vYkXk fokYk, kuk Eka Moks j gRks gS
 mnkgj .k & MfUk, kYk LkYk

3- bLkEka nksBkka electrodes , d
 gh fokYk, kuk Eka Moks j gRks gS
 mnkgj .k & UkyLUk LkYk

¼vFlk½

(1) Zn(s)|Zn⁺⁺(aq).5||Ag⁺(aq)10M|Ag(s)

dk 298K ij EMF dh x.kuk

$$(E^\circ_{\text{Ag}} = 0.789, E^\circ_{\text{Zn}} = -0.760)$$

gy & l y foHko dk l ehdj.k&

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

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

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

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

$$E_{\text{cell}} = 1.634\text{V}$$

1/2½ i kFkfed l sy , oaf}rh; d l sy eanksvrj

i kFkfed LkYk &

- 1- i kFkfed l sy , d ckj mi ; ksx ds ckn i q% vkof' kr ugha fd; k tk l drk gA
- 2- jkl k; fud vfHkfØ; k døy , d fn'kk ea gksrh gA

f}rh; d l sy

- 1- f}rh; d l sy dks mi ; ksx ds ckn i q% vkof' kr fd; k tk l drk gA
- 2- jkl k; fud vfHkfØ; k nksjka fn'kk ea gksrh gA

mÜkj 16-

lkFkEk dksV dh vfHkfØ,kk ds fYk,ks nj fLFkjkd dk fuk/kkj .k lLkEkKdYkUk dh fukf/k }kj k½

, d LkEkKk, vfHkfØ,kk lkj fukPkj djUks lkj

$$A \rightarrow fØ,kk QYk$$

$$A \quad a_{gm M/L}$$

; fn t = T, rc

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

æO,kkUkqkRkh fØ,kk ds fuk,kEkKkqk,kkj

^vfHkdj d dh vfHkfØ,kk dh Xkfrk mLkds LkfØ,k EkK«kk ds LkEkKkUkqkRkh gkRkk gA**

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

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

lk{kRkj djUks lkj

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

LkEkKdYkUk djUks lkj

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

$$\ln(a - x) = Kt + I_0 \quad \dots\dots(v)$$

$$\text{,kfn} \quad x = 0, t = 0 \quad \dots\dots(vi)$$

LkEkhdj .k (v) Eka Lks (vi) I s I_0 dk Ekkuk j [kUks Ikj

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

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

Ik{kRkj djUks Ikj

UkPkg Yk YkkWk dks LkkEkkU,k YkkWk Eka Ikfj OkRkZk Lks

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

mUkj 16

'kU,k dksV dh vfHkfØ,kk dsfYk, vfHkfØ,kk dh nj vfHkdj dka ds Lkkæ.k ds 'kU,k

?kkRk ds LkEkkukkkRkh gkRks gA

vfHkfØ,kk R → Prodc. Eka

$$nj \quad \frac{-d[R]}{dt} = k[R]^0 \quad \dots(i)$$

$$nj \quad \frac{-d[R]}{dt} = k \times 1 \quad D_{,kkfd} [R^0] = 1$$

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

nkBkka vkj dk LkEkdYkuk djUks Ikj

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

t c $t = 0$ gS RkCk $[R] = [R]_0$ $\frac{1}{2}R_0$ vfHkdj d dk Iktj fHkd Lkkæ.k $\frac{1}{2}$

; s Ekkuk LkEkhdj .k (iii) Eka j [kUks Ikj

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

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

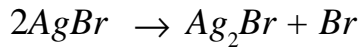
LkEkhdj .k (iii) vkj (v) Lks

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

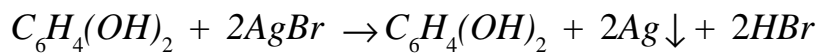
$$K = \frac{[R]_0 - [R]}{t}$$

mRrj 17 **Qk/kkkQh ds lkn &**

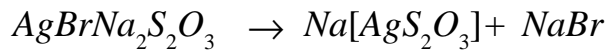
1- **mnHkkLkuk & dskjs ds Ykk dks OkLRq Ij dfaerK dj dN Lkd. M ds fyk, Ikd'k MkYRks gS bLks mnHkkLkuk dYk dgrks gA bLkLks OkLRq dk fPk«k IYk/ Ij vk TkkRk gA**



2- **MSKYfIkK djUk & fDokkYk] IkkbjkYkYk gkbMfDokkKk ,kk fEKMYk dk {kjh,k ?kYk MSKYk Ij gRk gS Tkksfd AgBr ds Ag Eka vIkPk,kuk dks IkwZ dj nRk gS bLkLks fUkXkSVok IkkIRk gRk gA**

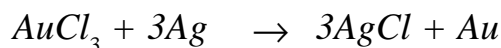


3- **fLFkjhdj .k & LkSM,kEk Fk,kkLYQ/ %gkblks fOkY,kuk dk mlk,kkK fUkXkSVok ds fLFkjhdj .k gRkfd,kk TkkRk gS vIkZkDRk AgBr gkblks Eka ?kYkdj vYkXk gS TkkRk gA**



4- **fIkVXk & fIkVXk Iksj Ij fUkXkSVok ds }kj Ikd'k MkYkdj dN LkE,k ds fyk, j [kk TkkRk gS fTkLkLks Iksj Ij OkLRq dh Lkgh fPk«k vfdRk gS TkkRk gS fIkVXk Iksj Ij AgCl fTKYk/huk dk Ysk gRk gA bLks /kKdj Lk[kk YRks gA**

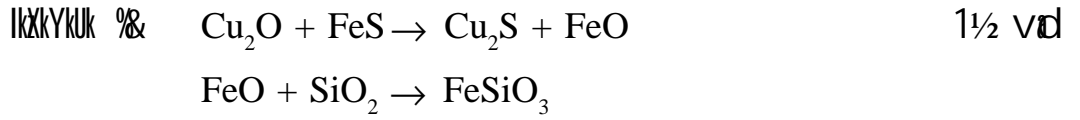
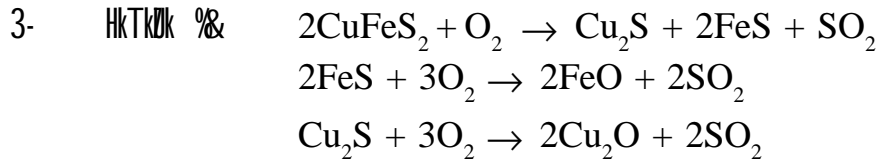
5- **VksukKk ,kk jk Lkdj .k & dYk LkQn fPk«k dks PkEdhYk CkukKks gRk AgCl₃ dk fOkY,kuk mlk,kkK fd,kk TkkRk gS fTkLks VksukKk dgrks gA**



1/2Fok1/2

1- **v;Ld dk I# %& dkkj IkkbjkbVhTk Cu₂S.Fe₂S₃ ,kk CuFeS₂ 1 vd**
 2- **v,kLd dk Lkæ.k %& dkkj ds LkYQkM v,kLd dk Lkæ.k Qk mRiYkkOkuk fOkf/k Lks fd,kk TkkRk gA IkhLsgg v,kLd CuFeS₂ dks Ikkukh Lks Hkjs gSf'k Eka MkYk fn,kk TkkRk gS RkRkÜPkkRk PkM ,kk ,kdkSYkIVek dk RkYk MkYkdj Okk,kq dh RkYk /kjk IkkkfgRk djUks Ij v,kLd ÖkXk ds ÅIj RkRk gA fTkLks vYkXk dj fyk,kk TkkRk gS vKj v'kf) ,kka UkhPkS CkB TkkRk gS bukdks vYkXk dj fyk,kk TkkRk gA**

1 vd



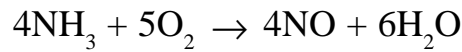
4- Ekv ds ?kvñ D₃kkkLk LKYQkbM RkFkk QjLk LKYQkbM gñ 1 vñ]
 (Cu₂S + FeS)

5- 'kks'kuk Eka Ik₃kñRk , d fokf/k fok | ßk vik?kVuk gñ vFkkk vU₃k LkEd{ k fokf/k dk UkEk ½ vñ

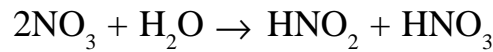
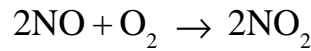
mÜkj 18

vkL VokkYM fokf/k Lks UkbfVñl vEYk ds fukEkzk k dk fLk) kRk

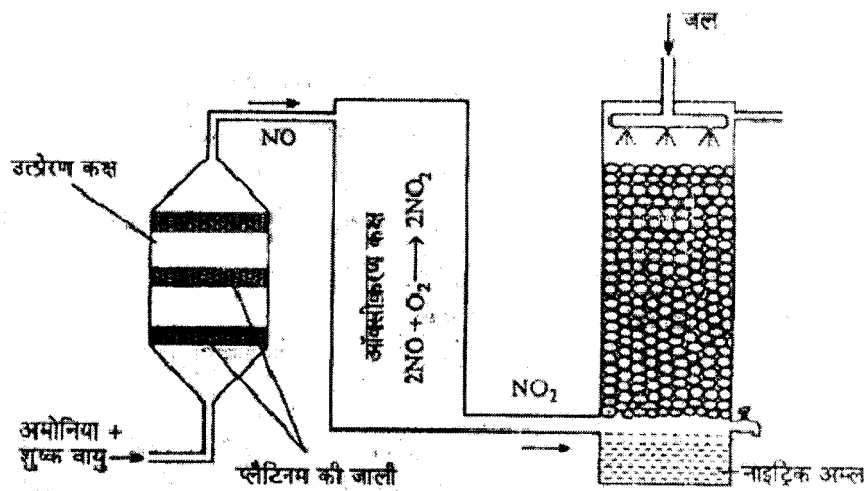
1 vk₃kRkuk vEkksÜk₃kk vkj 8 vk₃kRkuk Ok₃kq dk fEkJ.k Pt dh TkYkh ds Ålkj 800 808°C RkkIk Ikj IkñkfgRk fd₃kk TkRkk gS Rkks 90 IkRk' kRk vEkksÜk₃kk dk UkbfVñl vkDLkkbM Eka vkDLkhdj.k gks TkRkk gñ



TKYk fEYkkkUs Ikj UkbfVñl vEYk CkURkh gñ



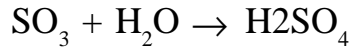
UkkEkñdRk fPk«k %&



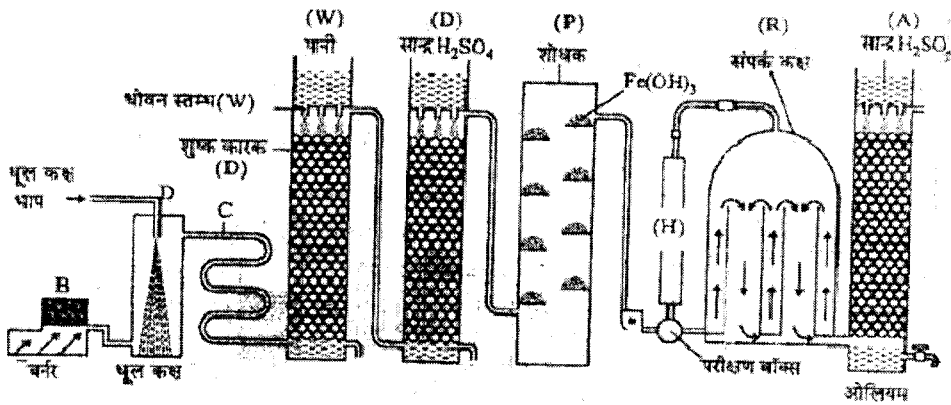
1/4 FkOkk 1/2

H₂SO₄ ds LkdkdZ d{k fOkf/k dk fLk) kRk &

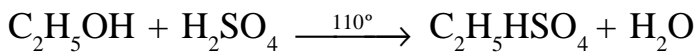
'kq) , Oka 'kqd SO₂ RkFkk Okk₃q ds fEkJ. k dks mRlkj d v₂O₅ lkj lkOkkfgrk dj Uks Lks Okg SO₃ Eka vkLkhNRk gks TkRkk gS Tkks TKYk Lks fO₃kk dj ds H₂SO₄ OkkRkk gS



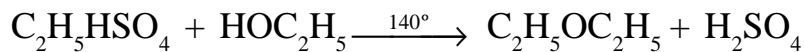
UkkekfdRk j[kfpk



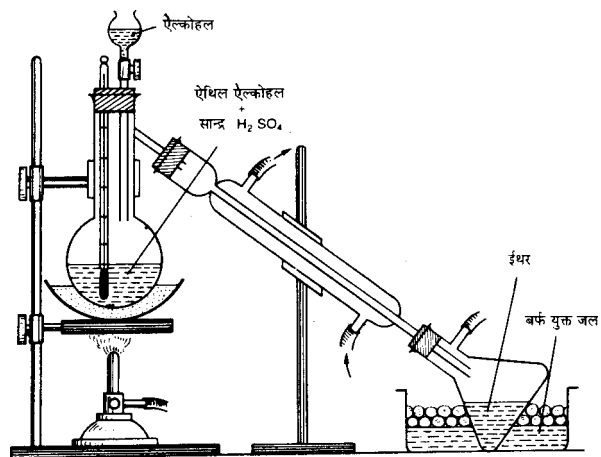
mUkj 19- 1/4 1/2 lk₃kk'kkYkk Eka Mkb, fFkYk bFkj OkkUks dh fOkf/k dk jLk₃kfUkd I ehdj.k



, fFkYk vYdkgYk



1/2 1/2 UkkekfdRk fPk &

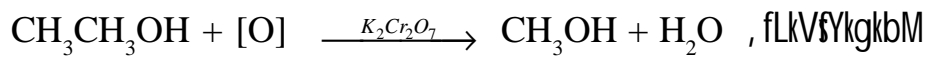


1/2 1/2 fOkf/k dk Lk{kRk Ok. kZk & vkLkOkUk 1YkLd Eka 100ml lkj 'kq) C₂H₅OH , Oka

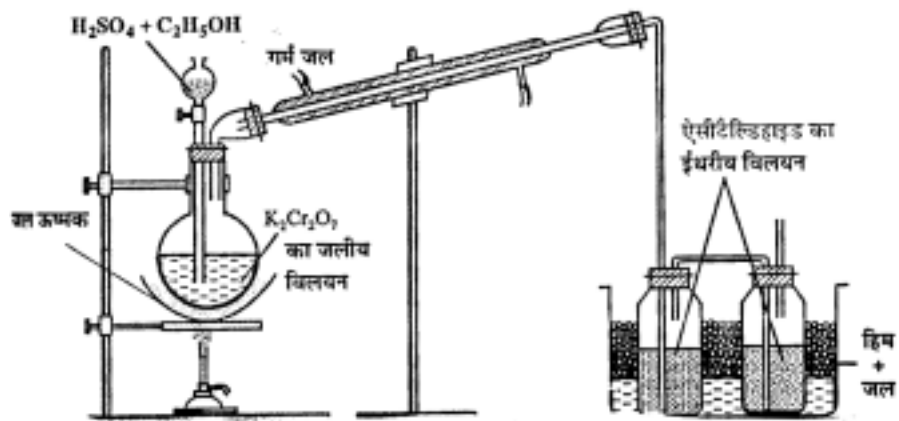
50ml Lkæ H_2SO_4 Ykdj CkYkw Å"Ekd lkj XkjEk djRks gS Rkklk $140^\circ C$ lkj j [kk TkkRkk gSA CkQZ fEKYks TkYk Lks j [ks gq Xkkg h ¶YkkLd Eka bFkj , d«k dj fYk_kk TkkRkk gA

¼/FlkKk½

¼½ , fLkVfYMGkbM fUkEkZ k ds fYk , jkLk_kfUkd LkEkhdj .k%&



½½ UkkEkKfdrk fPk«k &



½½ fof/k dk I f{klr o.ku %&

25gm $K_2Cr_2O_7$ dks 100ml TkYk Eka ?kkYkdj , d Xkkyk lkanh ds ¶YkkLd Eka YkRks gA fCkanpdkjh dhik Eka 35ml, C_2H_5OH RkFkk 20ml cmc H_2SO_4 dk fEkJ.k Ykdj ¶YkkLd dks TkYk m"Ekd lkj FkkMk XkEkZ djRks gA CkUkh Okk"lk Lkafkj«k ¼KkEkZ½ Lks XkqkjRkh gS CH_3CHO dh Okk"lk BAs dkkkhdYk ¶YkkLd Eka Lkafkj«k gkdj bFkj.h.k fOkYk_kuk CkUk YkRkh gS bLksRkUkq H_2SO_4 ds LkFk vkLkFkRk djUksLks'k) , LkVfYMGkbM lkkRk gkRkk gA

½2½2 vcl½