

छत्तीसगढ़ माध्यमिक शिक्षा मण्डल, रायपुर



j l k; u



d { k k x i i



l i i y i z u & i =

1/40 | k s 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 kfk dh voLFkk, & Bkd voLFkk	4	4
3-	fo y; u	4	4
4-	vk; fud l kE;	4	4
5-	jkl k; fud m"ekxfrdh	4	4
6-	j&lk d vfhk fØ; 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&cyk d ds l eg 15 o 16	6 *	6 * } 4 * } -10
10 (b)	P&cyk d 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-	vk d l 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 Ø0	mnñs ;	vd	ifr'kr
1-	ljy (Easy)	15	20%
2-	vd r (Average)	45	60%
3-	dfBu (Difficult)	15	20%
		75	100%

¼½ izui = fn'kk funñk , 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@mfpr tkMlk cuk, dk izu fn;k tkoxk vñ ; g iR; d l v ea izu Øeka 1 gksk A
- iR; d l v ea 1] 2 , oa 3 vñka ds izuka ea fhkUurk jgsh A l eLr 04 vñ ; k bl l s vf/kd vñks ds y?kñÜkj; rFkk nh?kñÜkj; izuka ea fodYi fn;k tkuk gSA fodYi izu ml h bdkbZ l srFkk l eku mnñs ; ka ds jgksA 04 vñ ; k bl l s vf/kd vñks ds izu iR; d l v ea , d l eku jgksA
- vf/kdre mÜkj l hek vfry?kñÜkj; ½ vñ@30 'kñ½ ½ vñ@50 'kñ½
 y?kñÜkj; ¼ vñ@75 'kñ½ ½ vñ@150 'kñ½
 nh?kñÜkj; ¼ vñ ; k vf/kd@250 'kñ½

fodYi ; kst uk

- y?kñÜkj; izu &
 4 vñ okysdy 4 izu ¼i zØ- 11] 12] 13 o 14½
 5 vñ okysdy 3 izu ¼i zØ- 15] 16 o 17½
- nh?kñÜkj; izu &
 6 vñ okysdy 2 izu ¼i zØ- 18 o 19½

dy 9 izu

i/u & i = dk Cyfi IV

Blue Print of Question Paper

fo" k; %& j l k; u

i wkkkd %75

l e; %3 ?k/s

i jh{kk %gk; j l dsMjh

bdkbz l -Ø-	bdkbz	bdkbz ij vkcfr vrd	vrdokj i/u							dy i/u
			1 vrd	2 vrd	3 vrd	4 vrd	5 vrd	6 vrd	6 vrd ; k bl l s vf/kd	
1	ijek.kq@ vkc/dku	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	ukfkkdh; 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 eaj l k; u	4	1 1	1						1 + 2
; kx		75	10@1	5	4	4	3	2	&	18\$1

Set - A

Higher Secondary School Certificate Examination

English

SAMPLE PAPER

Subject - English

Class - XII

Time- 3 Hrs

(M.M.) 75

(Instruction) & Directions

1- Attempt all the Question

Attempt all the Question

2- Question 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.

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

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

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

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

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

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 CkgfOkdYIkh,k Ikz Uk

- 1- v.k@vk,kuk Tkks sp^3d^3 Lkdj.k n'kkRkk g&

¼½ XeF_4	¼½ 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	¼½ 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	¼½ 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 IkkbZ TkRkh g&

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

¼½ TkYk ds LkkFk vFEkJ.kh g&	
¼½ vEkkSukdYk fLkYOkj UkkbV& dk vIkPk,kuk djRkk g&	
¼ ½ , LkhfVd vEYk Lks RkhUk Xkqkk nqkZk vEYk g&	
¼½ KOH dks XkEkZ djUks Ikj IkIRkgkRkk g&	

Que 1 (A) Multiple Choice question -

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

(a) XeF_4	(b) SF_6
(c) XeF_6	(d) $[Cr(NH_3)_6]^{3+}$
2. Symmetry in Match Box is -

(a) Cubic	(b) Orthorhombic
(c) Tetragonal	(d) Monoclinic
3. Factor which effect Degree of ionisation is -

(a) infinite dilution	(b) Nature of solvent
(c) nature of electrolyte	(d) temperature

4. 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) thrise weak in comparison of acetic acid
(d) obtain on heating KOH.

1/2 1/2 f j DRk LFkkUkka dh IkRkZ dhfTk,

- 1- NO⁺ dk LFkkbRk NO Lks &&& gkRk gA
- 2- 1/2 1/2 dk &&& ds Ik<< Eka j [kk TkRk gA
- 3- &&&&&& fuk' PkRkd ds : Ik Eka Ikz kDRk gkRk gA
- 4- VQYkUk IkYkEkj dk , dYkd &&&&&&&& gA
- 5- Qfj d DYkjbM ds TkYk, k fYk, k dh IkZfRk &&&&& 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

1/2 Uk 2- pH EkkUk dh IkfjHkk"kk , Oka Lkuk fYkf[k, A

Write the formula and definition of pH value.

1/2 Uk 3- æO, kEkkUk {kRk dk IkfjHkkf"Rk dhfTk, A

Define mass defect.

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

Write the name and formulae of two ores of fluorine.

1/2 Uk 5- Xk&Yk FkYk&kbM vfhkØ, kk dk 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.

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1/2

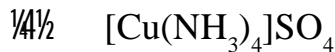
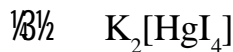
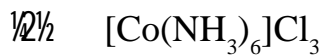
Write any four differences between Lyophilic and Lyophobic colloids.

Write any four differences between Lyophilic and Lyophobic colloids.

14-

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

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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 -

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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/FlOkk½

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/FlOkk½

'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 lkkkjkbVhTk Lks Rkkçkk ds fuk"d"lz k ds fUkEUK Iknka dks LEkÖkbbks

- 1- v₃kLd dk Lkwk
- 2- v₃kLd dk Lkkae.k
- 3- HkTkçk , Oka IkçkYkUk Iknka Eka IkçkçRk jkLkk₃kFUKd vfHkfØ₃kk
- 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 UKkbfV^ad vEYk ds fUkEkz k dks fUkEUK fçkany/ka ds vk/kkj Ikj fYkf [k, &

- 1- fLk) kRk
- 2- UKkEkçRk fPk«k
- 3- IkçkçRk jkLkk₃kFUKd vfHkfØ₃kk, 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¶₃kñj d vEYk ds fUkEkz k dh LkãkdZ 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 fUkEkz 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 fUkEkz 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 0kLRkqUK"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 fJDRk LFKkUK Hkj ks &
- 1 T, kknk
 - 2 Rkkckk
 - 3 DYkkj kQKEKZ
 - 4 V3/R 1Ykkj ks , fFkFYkUK
 - 5 vEYkh, k A

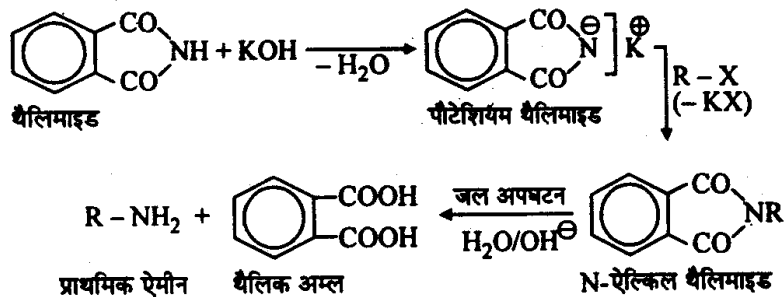
mukj 2 fdLkh fokYkUK dk pH EkkUK mLk __.kkREkd ?kkRk ds Lka, kkREkd EkkUK ds Ckj kCkj gkRkk gSA fTKLks 10 Ij YkXkk, kk TKkUK Pkfg, fTKLkLks mLk fokYk, kUK dk H⁺ vk, kUK LkkUæ. k n'kkzkk Tk LkdA

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

mukj 3 tc dkbz ijek. 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 = mc² 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 lkfRkTkSOkd vkSkf/k; kj
- 1- lksUkFLkFYkUk
 - 2- LVVVKkbbfLkUk
- mùkj 7- CkU/kh vk. kfOkd d{kd lkfRk vkCkakh vk. kfOkd d{kd
- 1- bukdh ÅTkk Lkakkk djUks OkkYks lkjEkk. kq 1- bukdh ÅTkk Lkakkk djUks OkkYks lkjEkk. kq d{kdk Lks dEk 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 vLFkff ,kRk YkRks gS
 - 3- bLkEka UkM/Yk RkYk Ugha gkRkh 3- bLkEka UkM/Yk RkRk gkRkh gS
- mRRkj 8- f«kT ,kk vUkqkRk fdLkh fØLVYk Eka mikFLfRk /kuk vk ,kuk RkFk __.k vk ,kuk fd f«kT ,kkvka dk vUkqkRk gkRkh gS A

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

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

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

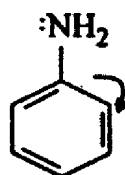
LkqkafYkRk O ,kOkLFkkk Eka v"VQYkdh ,k fjDRk ,kka dks Lkq ,kk ds Ckj kCkj gkRkh gS vRk% lkR ,kd XkksYks ds LkFk , d v"VQYkdh ,k QYkdh ,k fjDRk gkRkh v"VQYkdh ,k fjDRk dh f«kT ,kk dk vdkj XkksYks ds f«kT ,kk ds vdkj dk 0-414 Xkqkk gkRkh gS

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

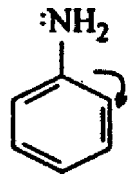
mùkj 9- , fykfQfVd , ehuk] , jkEkhVd , Ekhuk vkj vEksUk ,kk ds {kkj h ,k Xkqkka dh RkYkUkk

{kkj h ,k Xkqk

, fykQfVd , ehuk , jkEkhVd , Ekhuk vEksUk ,kk



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

3- {kkjh, k dk ?kVRkk gqvk OEK $\text{CH}_3 - \text{NH}_2 > \text{NH}_3 >$ 
 , SYkQSVd , Ekhuk vEkkkuk, kk , YkfhukYk A

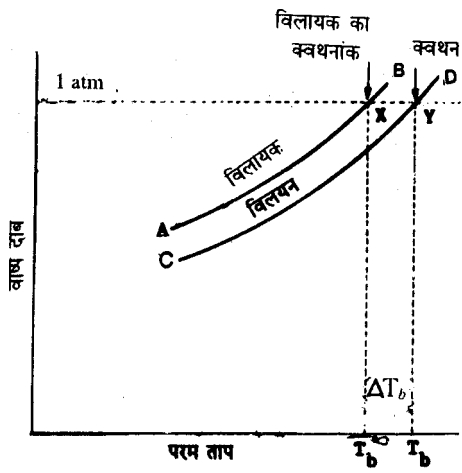
mUkj 10

- 1- UkkHkdh, k fj, kDVj Eka fok [k&Uk RkkIk@ATkkz mRlkuUk djUks ea
- 2- UkkfHkdh, k fok [k&Uk Lks JqEYkk vfHkfO, kk PKYkdj ATkkz mRlkknd gkRkk gA
- 3- UkkfHkdh, k fok [k&Uk Lks lkkIRk ATkkz dk mlk, kkkk bAuk , d fok | Bk ATkkz mRlkuUk 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—बिंदु 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

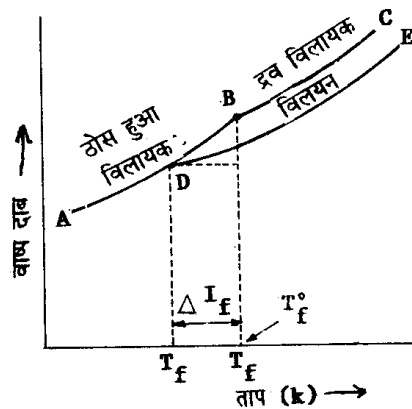
¼/Fkok½

fgek d svoueu 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; ekuđ kj

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

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

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

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

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

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

nksıka vkj 1000 dk xqkk djus ij

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

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

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

i {kkUrj djus ij

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

tgka $M_B =$ foyş dk v.kkkj

$K_f =$ eksy DoFkukd mlıu; u fLFkjkd

$\Delta Tf =$ DoFkukd 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 eðr Átkz Átkz dh og ek=k gS tks vf/kdre mi ; ksch dk; 7
 eai fjo fr r gsr h gseðr Átkz dseku dks LFkj rki , oankc ij ifjdfyr djrs
 gseðr Átkz dks fuEukud kj l si fjd fy r djrs gS

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

pfid] $H = E + PV$

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

eðr Átkz volFkk Qyu gS vr%

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

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

eðr Átkz ifjorú ds l e; rki , oankc flFkj gks rc

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

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

l eh- (iv) l s

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

pfid $\Delta H = \Delta E + P\Delta V] \quad \Delta H =$, UFKY ih ifjorú

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 Lokrk% IkokFRkRkk dh EkRk gS Á"EkKXkFRk ds

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

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

$$\Delta E = \text{vkRkfjd } \text{Átkz l kfj OkRkØk}$$

$$w = \text{Rkæk l kj fd,kk Xk,kk dk,kz gA}$$

,kfn gEka fdLkh Rkæk }kj k fd,ks Xk,ks dk,kz dh Xk.kukk djUkh gks Rkks w ds LFkkuk l kj

&w Ykblkk l kMxkk vrk% $\Delta E = q - w$

$$q = \Delta E + w$$

Rkæk }kj k fd,kk Xk,kk dk,kz w lklkkj dk,kz vksj vltkkj dk,kz nkslka dk ,kkkk gSA
 vltkkLkj dk,kz ds mlk,kkkk dk,kz ds : l k Eka l k kØRk fd,kk Tk k LkdRkk gA mLks vnkCk

vk₃ kRkUk dk₃ kZ mlk₃ kkskKh dk₃ kZ dgRks gA

$$VRk\% \quad q = \Delta E + w_{exp} + w_{nonexp}$$

$$lkj \& kq \quad w_{exp} = p\Delta V \quad \text{fLFkj nkCk lkj } \frac{1}{2}$$

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

fLFkj nkCk lkj , UfkZ/ikh lkfj OkRkZk

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

$$VRk\% \quad q = \Delta H + w_{nonexp}$$

fLFkj Rkklk lkj mRØEk. kh₃ k lkØEk ds fYk,

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

$$RkCk \quad T\Delta S = \Delta H + w_{nonexp}$$

$$\Delta H - T\Delta S = -w_{nonexp}$$

$$\Delta H - T\Delta S = \Delta G \quad \text{fLFkj Rkklk , Oka nkCk lkj } \frac{1}{2}$$

$$VRk\% \quad \Delta G = w_{nonexp}$$

$$\Delta G = w_{nonexp}$$

mRRkj 13

HkSRkd vf/k' kksk.k &

- 1- bLkEka vf/k' kksk.k vksj vfHk' kksk.k ds CkhPk ok.Mj cYI vkd"kZk nqkZk HkSRkd CkYk YkXkRkk gA Tkks vR₃ kRk nqkZk CkYk gkRkk gA

- 2- vf/k' kksk.k m"Ek dk EkkUk 1/20 l s 40kj/mol^{-1/2} dEk gkRkk gA

- 3- 1kg mRØEk. kh₃ k i Øe gA

- 4- 1kg RkRdkYk gkRks OkkYkk lkØEk gA

jLkk₃ kfuKd vf/k' kksk.k &

- 1- bLkEka vf/k' kksk.k vksj vfHk' kksk.k ds CkhPk jLkk₃ kfuKd CkZk CkURks gS vksj mUkds CkhPk lkZkYk jLkk₃ kfuKd CkYk YkXkRkk gA

- 2- vf/k' kksk.k m"Ek dk EkkUk 1/20 l s 40kj/mol^{-1/2} vf/kd gkRkk gA

- 3- 1kg vURØEk. kh₃ k lkØEk gA

- 4- bLkdk Okk vf/k' kksk.k , Oka vf/k' kksk.k ds LOkHkkOk lkj fukHkZ djRkk gSEkm₃ kk RkhOkz gksLkdRkk gA

¼/Flok½

æ0k LUKgh dks/kkbMYk &

- 1- f0kYkqk dks f0kYkk, kd Eka ?kkykUks lKj CkURkk gA
- 2- , ks LFkk, kh gkRks gS buKds LFkk, kh dj . k 2- ds fYk, LFkk, kh dj d lknkFkZ fEYkkUks dh vk0k' , kdRkk Ukggha gkRkh gA
- 3- bLkds LdUnUk ds fYk, f0k | Bk vik?kV; dh vf/kd Ekk«kk dh vk0k' , kdRkk gkRkh gS
- 4- dksYkkbMYkh f0kYk, kUkka ds d . kka ds LkkFk vf/kdRkk Eka f0kYkk, kd TkYk ds d . k TkM/s jgRks gA

æ0k f0kjks/kh dks/kkbMYk &

- 1- buKdks CkURkkUks ds fYk, f0k' ksk f0kf/k, kkj vIKUKkUkH lKMRkh gA
- 2- buKds CkURkkRks LkEk, k buKEka LFkk, kh dj d lknkFkZ fEYkk, kk TkRkk gA , ks vR, kRk vLFkk, kh gkRks gA
- 3- f0k | Bk vik?kVî dh vR, kRk dEk Ekk«kk Hkh buGa LIkânRk dj nRkh gA
- 4- buK dksYkkbMh f0kYk, kUkka ds d . k ds LkkFk f0kYkk, kd ds d . k TkM/s Ukggha gkRks gA

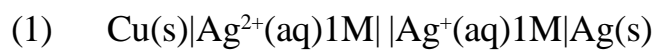
mUkj 14-

- 1- lkk/s' k, kEk gDLkk Lkk, kukQjV (II)
- 2- gDLkk , EkhUk dkskYV (III) ¶lykj kbM
- 3- lkk/s' k, kEk V3/R vk, kkbMkEkj D, kjV (II)
- 4- V3/R , EkhUk dkkkj (II) LKYQV

¼/Flok½

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

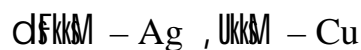
mRRkj 15-



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

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

$$E^\circ = 0.46V$$



¼1 HkkXk lkj 2 v0 ½

½2 js HkkXk lkj 3 v0 ½

½½

ආරම්භක ලිපි &

- 1- බලකා ජලක, ක්ෂුද්‍ර ආර්ථිකයේ දී ආරම්භක ලිපි ආරම්භක ලිපි ගණන ගණන
- 2- බලකා Cathode (+) ආරම්භක ලිපි Anode (-) /කාලය ගණන ගණන
- 3- බලකා නිකා electrodes වැනි & වැනි ආරම්භක ලිපි ආරම්භක ලිපි ගණන ගණන

ආරම්භක ලිපි &

- 1- බලකා ආරම්භක ලිපි ආරම්භක ලිපි ආරම්භක ලිපි ගණන ගණන
- 2- බලකා Cathode (-) ආරම්භක ලිපි Anode (+) /කාලය ගණන ගණන
- 3- බලකා නිකා electrodes , ද ආරම්භක ලිපි ආරම්භක ලිපි ගණන ගණන

½ෆෆෆ

- (1) $Zn(s)|Zn^{++}(aq).5||Ag^+(aq)10M|Ag(s)$
දී 298K ට ඊ EMF එහි x. කාලය

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

ආරම්භක ලිපි & ලිපි ආරම්භක ලිපි දී එහි කාලය

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

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

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

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

$$E_{cell} = 1.634V$$

½½

ආරම්භක ලිපි &

- 1- ආරම්භක ලිපි , ද කාලය ; කාලය දී කාලය කාලය කාලය කාලය
- 2- කාලය ; කාලය ; කාලය , ද කාලය කාලය කාලය කාලය

ආරම්භක ලිපි &

- 1- කාලය ; කාලය කාලය ; කාලය කාලය කාලය කාලය
- 2- කාලය ; කාලය ; කාලය ; කාලය කාලය කාලය කාලය

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

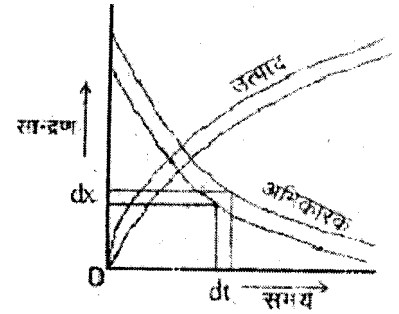
A $a_{gm M/L}$

; fn $t = T$, rc

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

æO, kkkkkkkk fØ,kk ds fuk, kkkkkkkkj

^vfHkdjd dh vfHkfØ,kk dh XfRk mLkds LkfØ, k Ekkkk ds Lkekku, kkkkkk 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

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

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

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

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 Ykkkk dks Lkekku, k Ykkkk Eka lkfj QkRkZk Lks

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

mRj 16 'k' dksV dh vfHkfo, dh dsfYk, vfHkfo, dh nj vfHkfo dka ds Lkkae. k ds 'k' k ?kRk ds LkEkkukRk gkRks gA

vfHkfo, 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 vfHkfo dka ds Lkkae. k/2

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

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

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

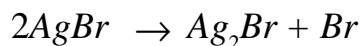
LkEkdj. k (iii) vkj (v) Lks

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

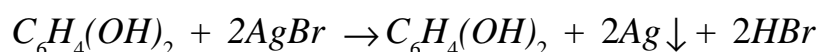
$$K = \frac{[R]_0 - [R]}{t}$$

mRj 17 Qk/kkQh ds lkn &

- 1- mnHkLkuk & dskjs ds Ykuk dks OkLRkq lkj dhæRk dj dN Lkd. M ds fYk, lkd'k k MkYRks gS bLks mnHkLkuk dkYk dgrks gA bLkLks OkLRkq dk fpkæ IYk/ lkj vk TkRk gA



- 2- MSYkfik & fdokkYk] lkbjkkYkYk gkbMkSDokkSk, kk fEkMkYk dk {kjh, k ?kYk MSYk lkj gkRk gSTkksfd AgBr ds Ag Eka vIkP, kuk dks lkwZ dj nBk gS bLkLks fukksVok lktRk gkRk gA

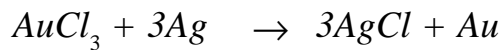


- 3- fLFkjhdj .k & LkksM₃kEk Fkk₃kkLKYQs/ ½gkbIkks fokyk₃kuk dk mlk₃kkkxk fukxksVok ds fLFkjhdj .k gBkqfd₃kk TkkRkk gS vIkzkpDRk AgBr gkbIkks Eka ?kykdj vYkXk gks TkkRkk g%



- 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 Lkd[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 IkhLks gq 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 OkkXk ds Aikj RkSRkk 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
 $FeO + SiO_2 \rightarrow FeSiO_3$

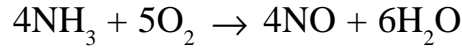
- 4- Eks/ ds ?kVd D₃kkLk LkYQkbM RkFkk QjLk LkYQkbM gA 1 vd]
 (Cu₂S + FeS)

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

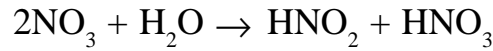
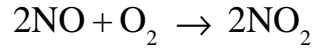
mùkj 18

vkL VOKYm fof/k Lk ukbfVd vEy ds fukEkz k dk fLk) kRk

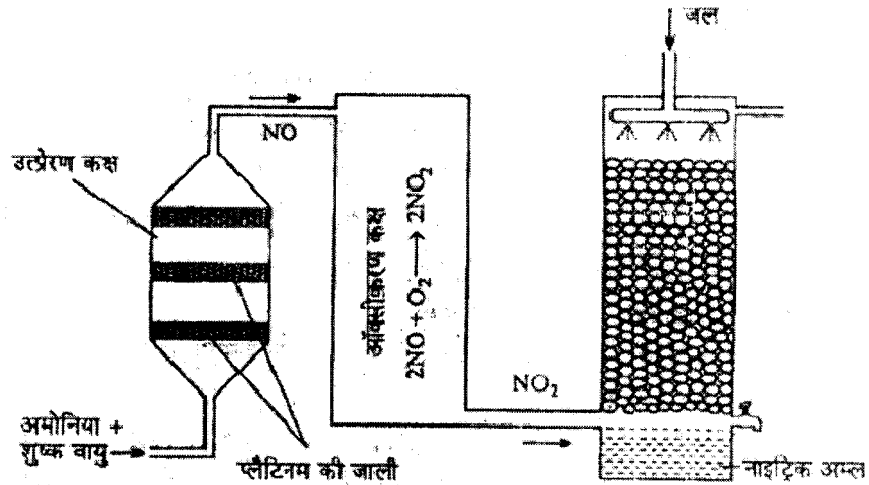
1 vk₃krkuk vEksuk₃kk vkj 8 vk₃krkuk Ok₃kq dk fEkJ.k Pt dh TkYkh ds Ålkj 800 808°C RkkIk lkj IkKkfgRk fd₃kk TkkRk gS Rkks 90 IkFR'kRk vEksuk₃kk dk ukbfVd vkDLkbbM Eka vkDLkhdj.k gks TkkRk gA



TKYk fEKYkkUks lkj ukbfVd vEy CkURkh gA



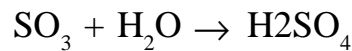
UkkEkfdRk fPk k %



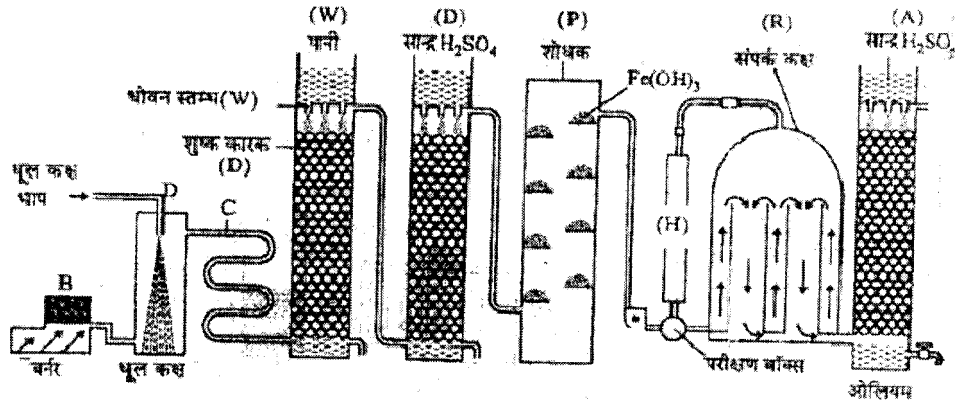
¼/FkOk½

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

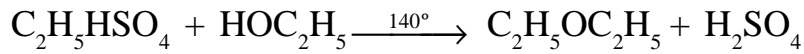
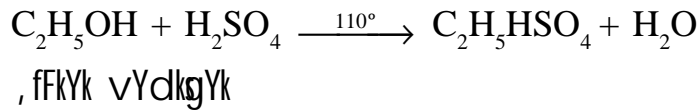
'kq) , Oka' ktd SO₂ RkFk Ok₃kq ds fEkJ.k dks mRlkj d V₂O₅ lkj IkKkfgRk djUks Lks Okg SO₃ Eka vkDLkhdjRk gks TkkRk gS Tkks TKYk Lk fØ₃kk dj ds H₂SO₄ CkURkRk gS



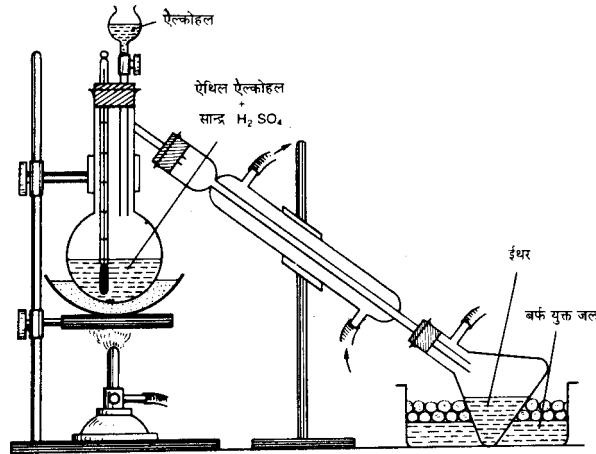
उत्कृष्टीकरण जलकृत



मुक्ति 19- 1/2 इतकक' कयक एका मक, फयक बफक कुकुकुस ध फक/क क जलक, कुकुद । एदज . क



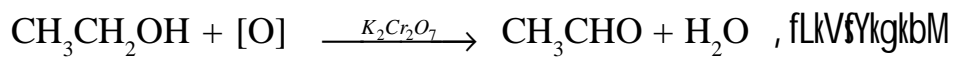
1/2 उत्कृष्टीकरण फक &



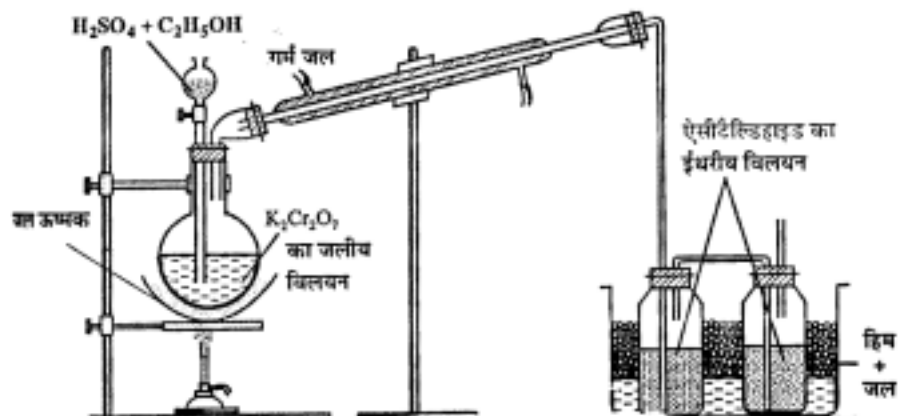
1/2 फक/क क लककक क. कक & वलकुक ययकलद एका 100ml कज' क) C_2H_5OH , एका 50ml लकके H_2SO_4 यकज कयक Å "एक इज खजक दज रकस गस रकक 140°C इज ज [क ककक गसा ककुकयक कयक लसज [कसग खकघ ययकलद एका बफक , दक दज फक, क ककक ग

1/2 फक

1/2 , फलकवयमककम फुककक क दस फक, जलक, कुकुद लककदज . क



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 RkFk 20ml emc H_2SO_4 dk fEkJ.k Ykdj 1YkkLd dks TKYk m"Ekd IkJ FkMk XkEkZ djRks gA CkUk Ok"ik LkRkfj«k Lks XkRkRk gS CH_3CHO dh Ok"ik BMs dkkhdYk 1YkkLd Eka LkRkfj«k gkdj bEkjh,k fOkYk,kUk CkUk YkRk gS bLks RkUq H_2SO_4 ds LkFk vLkfoRk djUks Lks 'k) , LkhSYMgkBM IkkIRk gkRk gA

1/2]2]2 v d 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 gsvk\$ 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. $\frac{1}{4}$ & $\frac{1}{2}$ marks each

1. O_2^{2-} has how many lone pairs of electrons?

$\frac{1}{4}$ 4	$\frac{1}{2}$ 6
$\frac{1}{4}$ 8	$\frac{1}{2}$ 10
2. Which of the following is a crystalline solid?

$\frac{1}{4}$ X-ray diffraction	$\frac{1}{2}$, dUkRkk{k Xkdkd
$\frac{1}{4}$ ½ dkkk	$\frac{1}{2}$ 'OkRk fVUk
3. Which of the following is a strong electrolyte?

$\frac{1}{4}$ ½ IkkYk fok Rk vIk?kVî	$\frac{1}{2}$ nqkZk fok Rk vIk?kVî
$\frac{1}{4}$ ½ $\frac{1}{4}$ ½ Ok $\frac{1}{2}$ ½ nkskka Eka	$\frac{1}{2}$ mlkj kDRk Eka Lks dkbZ UkghA
4. Which of the following is a non-polar molecule?

$\frac{1}{4}$ ½ CCl_2F_2	$\frac{1}{2}$ CCl_3F_3
$\frac{1}{4}$ ½ CF_4	$\frac{1}{2}$ mlkj kDRk Eka Lks dkbZ UkghA
5. Which of the following is a primary alcohol?

$\frac{1}{4}$ ½ CH_3CHO	$\frac{1}{2}$ C_2H_5OH
$\frac{1}{4}$ ½ $C_6H_5COCH_3$	$\frac{1}{2}$ $C_6H_5CH_2CH_2OH$

Que 1 (A) Objective type questions:

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

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

(a) graphite	(b) monocline sulphur
(c) glass	(d) white tin
3. Ostwald law is applicable on which type of electrolyte solutions -

(a) Strong electrolyte	(b) Weak electrolyte
(c) A and B both	(d) None of them
4. Freyon is -

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

5. Which 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- Ckdk ØEk fdLks dgrks gñ N₂ ds v. kq ds CkdkUk 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- DOKFKUkkad Eka mUUK, kUk ds vk/kkj lkj vOkk"lk' khYk fOKYkŸk lknkFkZ dk v. kŸkj KkRk dhFTk, A
Determine the molecular mass of a non volatile solute with teh help of elevation of boiling point.

½/FkOkk½

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

Determine the moleculr 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- HkkŸRkd , Oka jkLkk, kfUkd vf/k' kŸk. k Eka Pkkj vBkj fYkf[k, \

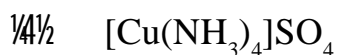
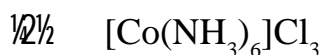
Write any four differences betwen physical adsorption and chemical adsorption.

½/FkOkk½

æOk LUkŸgh dksŸkkbM , Oka æOk fOkj kŸth 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

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3. Tetra Cyano Nickelate (II) ion

4. Tetra carbonyl Nickel (O)

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

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

(1) Calculate the EMF 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

$Zn(s) | Zn^{2+}(aq.) || Ag^+(aq.) (1.0M) | Ag(s) (1.0M)$ at 298K
 EMF of the cell is $E^\circ_{Ag^+/Ag} = 0.789V, E^\circ_{Zn^{2+}/Zn} = -0.76V$

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

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

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

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

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

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

$\frac{1}{n} \ln \frac{[A]_0}{[A]}$

'kU,k dksV dh vfHkfØ,kk ds fy, 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- flkfVzk
- 5- VksUkzk ,kk jzk Lkdj.k

Explain photography on following points -

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

$\frac{1}{n} \ln \frac{[A]_0}{[A]}$

dKkUj Ik,kj kbVhTk Lks RkkÇk ds fUk"d"lz k ds fUkEUk Iknka dks LkEkÖkbb,ks

- 1- v,klD dk Lkkk
- 2- v,klD dk Lkkæ.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-
f o k f / k d k L k f { k i R k O k . k z k A

- 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

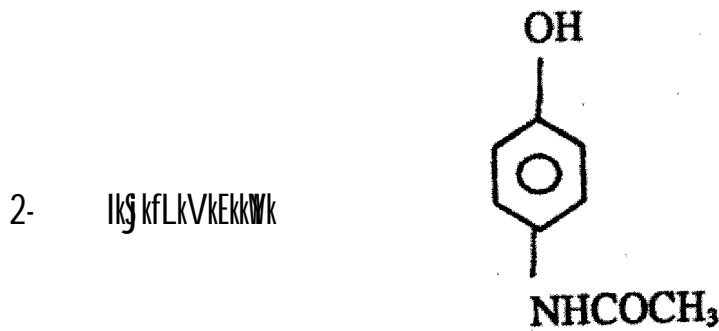
Explain the Lab method preparation of CH_3CHO in the following points-

- (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 fEKYkk 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& d k 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, RkRok 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, RkRok 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- gkbtk&DYk&j Lk vEYk & HClO $\frac{1}{4} \text{vd}\frac{1}{2}$
 - 2- DYk&j d 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 dkc&Uk Mk,kI YQkbM v&j EkjD,k&j d DYk&j kbM ds LkkFk gYdk XkEkZ djUks Ikj , fLdYk vkbLk&Fkk,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 Ekklk 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 Ckzkuk 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 dkSkkYV & 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 vk₃kq dk fUk/kkj . k & HkU&XkHkZ 'kkL«k ds v/₃k₃kuk Eka RkFkk
 Xkgka ds v/₃k₃kuk Eka [kfUTkka RkFkk PkêkUkka dh vk₃kq 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 LkEkUkKkRk ghkRk 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 ghkRk 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 [kuk s lkj]

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

$$m = \frac{1000 K_f w}{\Delta T_f w}$$

bLk Lkuk dh Lkgk kRkk Lks ΔT_f KkRk gkks lkj vOkk'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 tks vf/kdre mi ; ksh dk; l eafjofr gsh gseDr ΔT dseku dks lFkj rki , oankc ij ifjdfyr djrs gseDr ΔT dks fuEkuq kj l ifjdfyr djrs gS

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

$$H = E + PV$$

$$G = E + PV - TS$$

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 lFkj gsh rc

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

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

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

$$\Delta H = \Delta E + P\Delta V \quad \Delta H = \text{, UfkYih ifjorU}$$

$$\Delta G = \Delta H - T\Delta S \text{ bfr fl) e}$$

bl sgh fxcI gYegkYVt l ehdj .k dgrs gA

1/2 Fkok 1/2

ΔG fdLkh jkLkk kfuKd vfHkfØ,kk dh LkRk% lkkfRkRkk dh EkRk gS Δ EkkYkRk ds lkFkEk fuK,kek Lks $\Delta E = q + w$

$$q = \text{Rkak } \text{]kj k vOk' kks'kRk m'Ekk}$$

$$\Delta E = \text{vkrkfjd } \text{\AA} \text{Tkkz Ikfj } \text{Okrkzk}$$

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

fn gEka fdLkh Rkæk }kj k 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 }kj k fd,ks Xk,ks dk,kz w IkLkkj dk,kz vksj vIkLkkj dk,kz nkskka dk,kz gSA vIkLkkLkj dk,kz ds mlk,kkk dk,kz ds: Ik Eka Iks kPRk fd,ks Tkk LkdRkk g\AA mLks vnkCk vk,krkuk dk,kz mlk,kkk dh 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 Ikfj Okrkzk

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

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

fLFkj Rkkk Ikj mRØEk. kh,k IkØEk ds fYk,

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

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

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

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

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

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

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

mRRkj 13

HkSRkd vf/k' kSk.k &

- 1- bLkEka vf/k' kSk.k vksj vfHk' kSk.k ds CkPk d.Mj dYT k vdk"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 CkAk CkURks gS vksj mUkds CkPk IkCkYk jkLkk, kfUkd CkYk YkXkRkk

- | | |
|---|--|
| <p>2- $\text{vf/k'kkšk.k m"Ek d k EkkUk } \frac{1}{20} \text{ l s}$
$40\text{kJ/mol}^{-1}\frac{1}{2}\text{dEk gkRkk gA}$</p> <p>3- ,kg mRØEk.kh,k gA</p> <p>4- $\text{,kg RkRdkYk gkRks OkYkk IkØEk gA}$</p> | <p>2- $\text{vf/k'kkšk.k m"Ek d k EkkUk } \frac{1}{20}$
$\text{l s } 40\text{kJ/mol}^{-1}\frac{1}{2} \text{vf/kd gkRkk}$
gA</p> <p>3- $\text{,kg vUkØEk.kh,k IkØEk gA}$</p> <p>4- $\text{bLkdk Okk vf/k'kkšk.k , Oka}$
$\text{vf/k'kkšk.k dsLØHkkOk Ikj fukHkj}$
$\text{djRkk gSEkm ,kk RkØkz gksLkdRkk}$
gA</p> |
|---|--|

$\frac{1}{2}\text{Flök}\frac{1}{2}$

æOk LUKsh dkYkkgMYk &

- 1- $\text{fOkYkšk dks fOkYkk,kd Eka ?kkYkUks}$ 1-
 Ikj OkURkk gA
- 2- $\text{,ks Lfkk,kh gkRks gS buKds Lfkk,khdj . k}$ 2-
 $\text{ds fYk, Lfkk,khdkj d lknkFIZ fEKYkkUks}$
 $\text{dh vkOk' ,kdRkk Ukgha gkRkh gA}$
- 3- $\text{bLkds LdUnUk ds fYk, fOk | Rk}$ 3-
 $\text{vIk?kV; dh vf/kd Ekk«kk dh}$
 $\text{vkOk' ,kdRkk gkRkh gS}$
- 4- $\text{dkYkkbMYkh fOkYk,kUkka ds d.kka ds}$ 4-
 $\text{LkkFk vf/kdRkk Eka fOkYkk,kd TkYk}$
 $\text{ds d.k TkYs jgRks gA}$

æOk fOkjks'kh dkYkkbMYk &

- 1- $\text{bukdks OkURkUks ds fYk, fOk'kšk fOkf/k,kkj}$
 $\text{vIkUkkUk IkMRkh gA}$
- 2- $\text{bukds OkURks LkEk,k buKEka Lfkk,khdkj d}$
 $\text{lknkFIZ fEKYkk,kk TkRkk gA ,ks vR,kRk}$
 vLfkk,kh gkRks gA
- 3- $\text{fOk | Rk vIk?kVÎ dh vR,kRk dEk Ekk«kk}$
 $\text{Hkh buGa LIkânRk dj nRkh gA}$
- 4- $\text{buk dkYkkbMh fOkYk,kUkka ds d.k ds}$
 $\text{LkkFk fOkYkk,kd ds d.k TkYs Ukgha gkRks}$
 gA

mUkj 14-

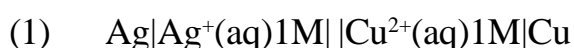
- 1- $\text{Ikks/S'k,kEk gDLkk Lkk,kukQjS/ II}$
- 2- $\text{gDLkk , EkhUk dkskYV III ¶Ykj kbM}$
- 3- DYkkj kbM 3- $\text{Ikks/S'k,kEk V\$/R vk,kk\$/kEkj D,kjS/ II}$
- 4- $\text{V\$/R , EkhUk dkMkj II LKYQ\}$

$\frac{1}{2}\text{Flök}\frac{1}{2}$

- 1- $\text{K}_3[\text{Fe}(\text{CN})_6]^{\text{III}}$



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 Ikfj OkRkZk gkRkk gS

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

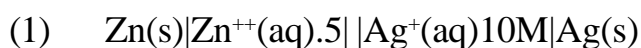
2- bLkEka Cathode (+) RkFkk Anode (-) /kqk gkRkk gS

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 LkSk

3- bLkEka nksBkka electrodes , d gh fokYk, kuk Eka Moks j gRks gS mnkgj .k & UYkLUk 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 fokf/k }kj k½

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

$$A \rightarrow fØ,kk QYk$$

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

; fn t = T, rc

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

æO, kkkkkRkh fØ,kk ds fuk, kEkkkkkkj

^vfHkd kj d dh vfHkfØ,kk dh Xkfrk mLkds LkfØ, k Ekk«kk ds LkEkkkkkkRkh 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{kkRkj djUks I kj

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

LkEkkdYkuk djUks I kj

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

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

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

Lkhdj .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{kRkj djUks lkj

UkPkg Yk YkkWk dks LkkEkkU,k YkkWk Eka lkfj QkRkZk 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,k dsfyk, vfHkfØ,k dh nj vfHkdj dka ds Lkkae .k ds 'kU,k ?kRk ds LkEkkukkkRkh gkRks gA

vfHkfØ,k R → Prodc. Eka

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

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

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

nkBkka vkj dk LkEkdYkuk djUks lkj

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

tc $t = 0$ gS RkCk $[R] = [R]_0$ $\frac{1}{R_0}$ vfHkdj d dk lkj fhkd Lkkae .k

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

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

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

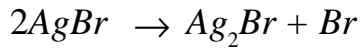
Lkhdj .k (iii) vkj (v) Lks

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

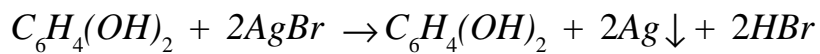
$$K = \frac{[R]_0 - [R]}{t}$$

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

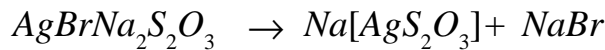
- 1- **mnHkkLkuk & dskjs ds Ykk dks OkLRq Ij dfaerK dj dN Lkd. M ds fyk, Ikdk'k MkYRks gS bLks mnHkkLkuk dkYk dgrks gA bLkLks OkLRq dk fPk«k IYk/ Ij vk TkkRk gA**



- 2- **MSkYfIkK djUk & fDokkYk] IkkbjkYkYk gkbMfDokkYk ,kk fEkMkYk dk {kjh, k ?kYk MSkYk Ij gRk gS Tkksfd AgBr ds Ag Eka vIkPk, k dk IkwkZ dj nRk gS bLkLks fUkXkSVok IkkIRk gRk gA**

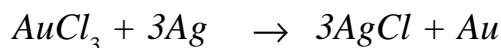


- 3- **fLFkjhdj .k & LkSM, kEk Fk, kLkYQ/ %gkblks fOkYk, k dk mlk, kKk fUkXkSVok ds fLFkjhdj .k gRkfd, k TkkRk gS vIkZkDRk AgBr gkblks Eka ?kYkdj vYkXk gk TkkRk gA**



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

- 5- **VksukKk ,kk jKk Lkdj .k & dkYk LkQn fPk«k dks PkEdhYk CkUkLks gRk AgCl₃ dk fOkYk, k mlk, kKk fd, k TkkRk gS fTkLks VksukKk dgrks gA**

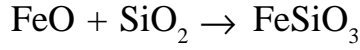
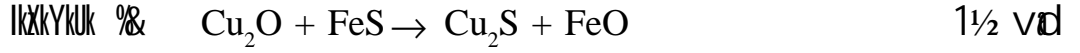
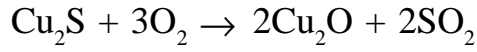
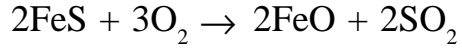


1/2Fok1/2

- 1- **v; Ld dk I# %& dkWj IkkbjkVhTk Cu₂S.Fe₂S₃ ,kk CuFeS₂ 1 vd**
- 2- **v, kLd dk Lkæ. k %& dkWj ds LkYQkM v, kLd dk Lkæ. k Qk mRiYkkOkuk fOkf/k Lks fd, k TkkRk gA IkhLsgg v, kLd CuFeS₂ dks Ikkukh Lks Hkjs gkT'k Eka MkYk fn, k 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, k TkkRk gS vKj v' kq) ,kka UkhPkS CkB TkkRk gS bukdks vYkXk dj fyk, k TkkRk gA**

1 vd

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



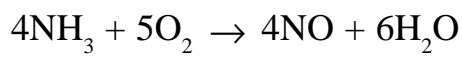
4- एक्स/ दस ? क्वद ड, क्वक लक्यकबम रकफक क्ज लक लक्यकबम ग्वा 1 वंद]
 (Cu₂S + FeS)

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

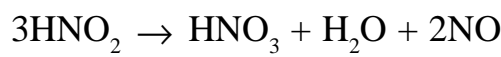
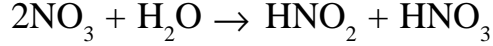
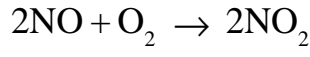
mUkj 18

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

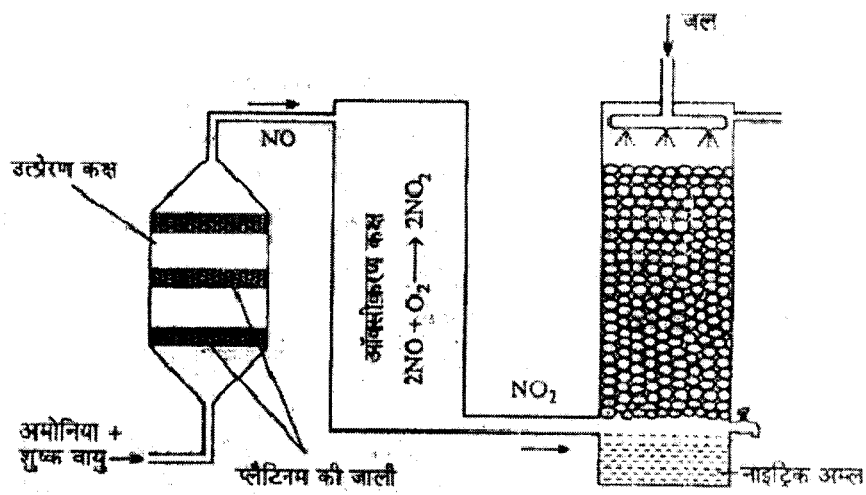
1 वक, ककुक वEककु, कक वक 8 वक, ककुक क्क, क्क दक fEkJ. क Pt dh ककक्यk दस Ålkj 800 808°C रककक lkj lkककfgRk fd, कक कककक गs Rkks 90 lkRk' कक वEककु, कक दक उक्कbfV'द वकDLककबम एका वकDLkhdj. क गकस कककक ग्वा



TKYk fEYkकुस lkj उक्कbfV'द वEYk ककुRkक ग्वा



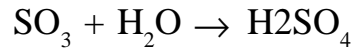
UkkEkk'दRk fPk'कक %&



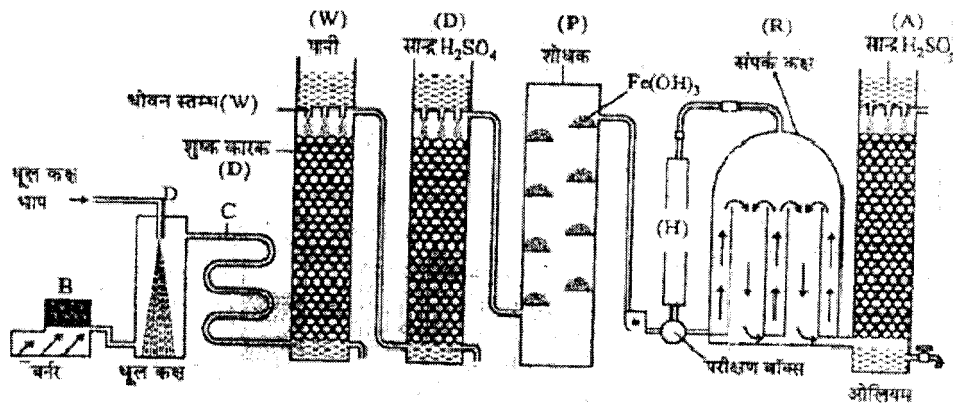
1/2 FkOkk 1/2

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

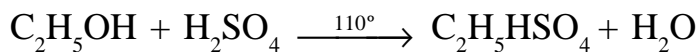
'kq) , Oka 'kqd SO₂ RkFkk Okk,kq ds fEkJ.k dks mRlkj d v₂O₅ lkj lkdkkfgRk dj Uks Lks Okg SO₃ Eka vkDLkhNRk gks TkRkk gS Tkks TKYk Lks fØ₃kk dj ds H₂SO₄ CkUkRkk gS



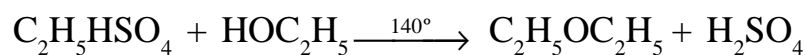
UkkekfdRk j[kfkPk«k



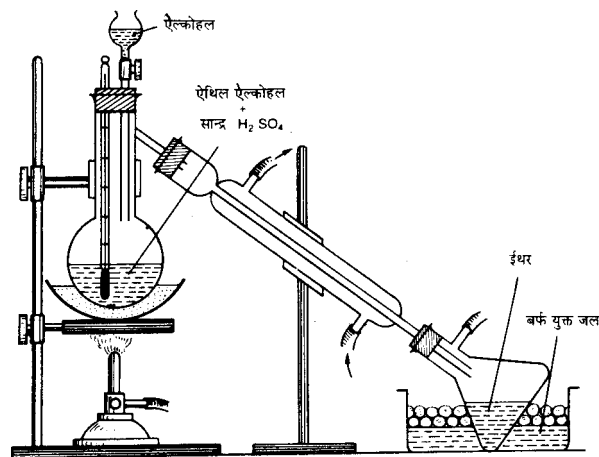
mUkj 19- 1/1 1/2 lkdkk'kkyk Eka Mkb, fFkyk bFkj CkUkUks dh fdkf/k dk jkLk,kfUkd I ehdj.k



, fFkyk vYdkgyk



1/2 1/2 UkkekfdRk fPk«k &

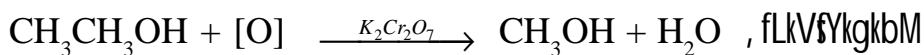


1/2 1/2 fdkf/k dk LkdkkRk Ok.kZk & vkLkOkUk 1YkLd Eka 100ml lkfj'kq) C₂H₅OH , Oka 50ml Lkkae H₂SO₄ Ykdj CkYkw Å"Ekd lkj XkjEk dj Rks gS Rkkk 140°C lkj j [kk

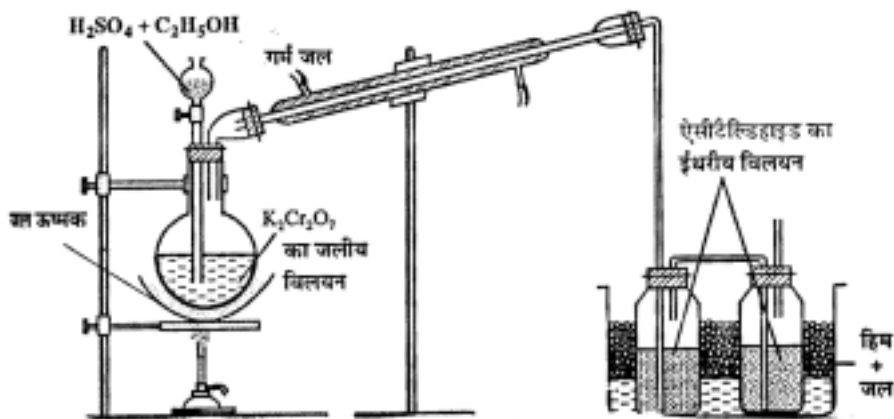
TKRkk gSA CkQZ fEKYks TKYk Lks j [ks gq Xkkgh FYkkLd Eka bFkj , d«k dj fYk,kk TKRkk gA

¼/FkOkk½

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



¼½ UKkEkKfjRk fPk«k &



¼½ fof/k dk I f{klr 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 dkkkhdYk FYkkLd Eka Lkafkj«k gkdj bFkj.h.k fOYk, kuk CkUk YkRkh gS bLksRkUkq 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 mfr
I cdk tkSM, A iR; d izu 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- izu Øekad 02 I situ Øekad 06 rd vfr y?kqRrjh; izu gSA iR; d izu
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- izu Øekad 07 I situ Øekad 10 rd y?kqRrjh; izu gSA iR; d izu 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- izu Øekad 11 I situ Øekad 14 rd y?kqRrjh; izu gSA iR; d izu ea
vkrfjd fodYi gSvkS iR; d izu 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.

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

- 1- fUkEuk Eka dks₁ vUkPkd₂ O₂ kOkgj lknf' kRk dj Rkk g&
 $\frac{1}{2}$ C₂ $\frac{1}{2}$ O₂²⁻
 $\frac{1}{2}$ O₂²⁺ $\frac{1}{2}$ O₂⁻
- 2- fUkEukfYkf [kRk Eka Lks dks₁ LkgLk₂ Bk₁ Eka TkYkd fCkng gkRkk g&
 $\frac{1}{2}$ v.kq $\frac{1}{2}$ /kukk₁ kuk
 $\frac{1}{2}$ __.kk₁ kuk $\frac{1}{2}$ lkj Ekk.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) O₂²⁺ (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 IkRkZ dhFTk, &

- 1- DYkshuk dh fckjTuk fØ,kk ds fYk, &&&&mÜjnk, kh gA
- 2- dSYLk, kEk, LkhV/ ds, d v.kq dks XkEkZ dj Uks lkj &&&&IkIRk gkRk gA
- 3- DYkshuk dk Lkuk &&&&gA
- 4- dkyRkkj ds IkHkTkh vLkOkuk Ls IkIRk Ek, k Rkyk Eka &&&&mlkLFkRk gkRk 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- Ckshuk VRbYkshukbM Ykplk 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- Ykshuk ds vLkRk 0, kOkkj dks LI"V dhFTk, \

Explain the Anomalous behaviour of fluorine.

Ikz Uk 5- fEkj Ckshuk dk Rkyk fdLks dgRks gA bLkdk Lkuk fYkf[k, \

What is oil of mirbane? Write its formula.

Ikz Uk 6- Ckshukdhj.k dks IkfjHkk"krk dhFTk, \

Define polymerisation.

Ikz Uk 7- kOkV Lkyk dh IkfjHkk"kk fYkf[k, A ?kukh, k, kOkV Lkyk ds ?kukRok ds fYk, Lkuk

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- UKKKhKdh,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- DkFkUkKkd Eka mUUK,kUk ds vk/kkj Ikj vOkk"ik' khYk fOkYkSk IknkFkZ dk v.kBkj KkRk dhfTk, A

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

½/FkOkk½

fgEkKkd Eka vOkUkEKUk ds vk/kkj Ikj vOkk"ik' khYk fOkYkSk IknkFkZ dk v.kBkj 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- HkKSRkd , Oka jkLk,kfUkd vf/k' kKSk.k Eka Pkkj vBkj fYkf[k, \

Write any four differences between physical adsorption and chemical

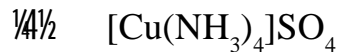
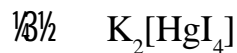
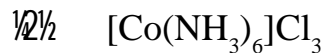
adsorption.

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 Fk0k1/2

'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 Fk0k1/2

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 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.

18- Cu_2S fokf/k Lks UKkbfV^d vEYk ds fUkEkZk dks fUkEUk fCknp/ka ds vk/kkj Ij fYkf [k, &

- 1- fLk) kRk
- 2- UKkEkf^d 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^q, k^{ij} d vEYk ds fUkEkZk dh Lk^{kd} fokf/k dk Ok. k^{zk} fUkEUk fCknp/ka ds vk/kkj Ij dhfTk, &

- 1- fLk) kRk
- 2- UKkEkf^d 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 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/F10k½

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

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 ÜYkkfjÜk 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 vÜkkYkC/kRkk A dkbZ nks fCkq fYk[kÜks lkj &02 vad A

mRRkj 5 fEj CkÜk dk RkYk & ÜkkbVÜkÜkhÜk

LkÜk & C₆H₅NO₂

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

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

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

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

mRRkj 7 ,kÜkV LkYk & fdLkh fØLVYk tkYkd dk Ökg LkÜkEkkEkk HkkXk CkgÜk Nks/h Nks/h

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

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

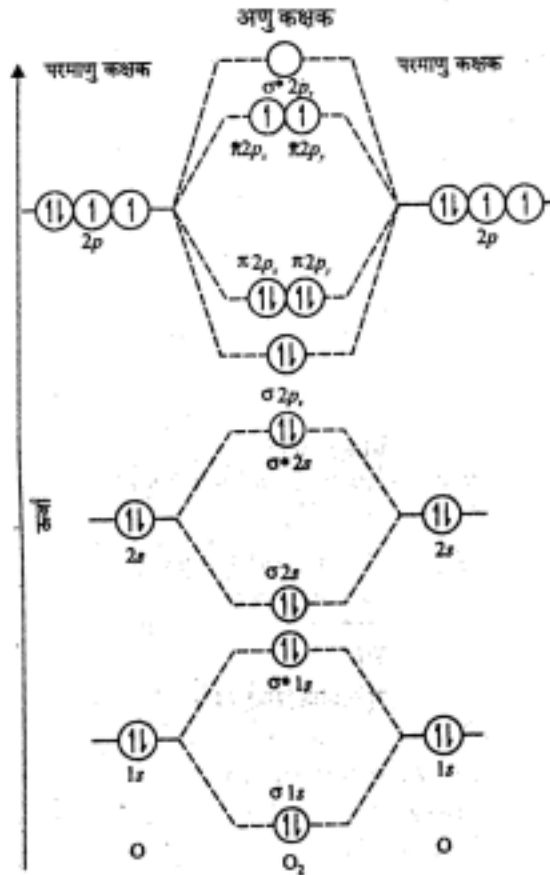
1/2,Ük LkEkd{k lkjHkk"kk fYk[kÜks lkj &03 vad 1/2

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 mLkdak vkf. Okd d{kd vkjs[k n'kkzks vUkqkkj gkRkk A



2-

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

¼kgh ÅTkkz vkjs[k lkj & O_2 vñ A Lkgh PkqCkdh, k lkañfrk 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
 TkLkK XkKk gkRkK gS

mRRkj 10- Ukkfhkdh, k fOkfdj .kka ds TkSOkd [krkj &
 Ukkfhkdh, k ÅTKZ ds mlk, kkkk Lks mRIKUk LkEkL, kk dks fYk [kUks Ikj 01 vð
 LkRkRk~ fOkdkLk IkKkfkORk 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 gS
 fOkYk, kUk RkFk 'kq) fOkYk, kd ds DOKfUkkad Eka vRkj dks fOkYk, kd ds DOKfUkkad Eka
 mUk, kUk dgRks gS bLks ΔTb Lks n' kRks gS
 Ekkuk 'kq) fOkYk, kd dk DOKfUkkad T₁ gS RkFk fOkYk, kUk dk DOKfUkkad T₂ gS A
 DOKfUkkad Eka mUk, kUk ΔTb ³/₄ T₂ - T₁ gkKk A
 fdLkh Okk"ik' khYk lknkfkZ dks TkYk Eka ?kYkUks Ikj DOKfUkkad Eka Okf) æOk ds Okk"lknkCk
 Eka vOkUkEkUk ds LkEkkUkKkRkKk gkRkK gS

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

YkSdUk $\Delta p \propto m \text{ } \frac{1}{2} \text{EkYkYkRkK} \frac{1}{2}$

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

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

vFkkRk DOKfUkkad Eka mUk, kUk fOkYk, kUk dh EkYkYkRkK ds LkEkkUkKkRkKk gkRkK gS
 , kfn w XkkEk fOkYk, kd Eka w XkkEk fOkYkSk ?kYkK gS

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

$$\text{eksyYrk } \frac{3}{4} \frac{w \times 1000}{w \times \text{foys}} \text{ dk v. kkkj}$$

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

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

1/2 FkOkk/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 3/4 rks $\Delta T_f = k_f$

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

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

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

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

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

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

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

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

lR, kd Lkgh lkj 1]1]1 v0d

bLk Lk0k dh Lkgk, kRkk Lks ΔT_f KkRk gk0ks lkj v0k'lk' khYk lknkFkz dk v. k0kkj m KkRk dj LkdRks g0

mRRkj 12

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

fdl h fudk; dh e0r 0tkz 0tkz dh og ek=k gS tksvf/kdre mi ; ksh dk; l eafjofr0r gksh g0e0r 0tkz dseku dks fLFkj rki , oankc ij ifjdfyr djrs g0e0r 0tkz dks fuEuku0 kj l ifjdfyr djrs g0

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

pfid] $H = E + PV$

$$G = E + PV - TS$$

e0r 0tkz volFkk Qyu gS vr%

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

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

e0r 0tkz ifjor0 dsl e; rki , oankc fLFkj gksh 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 $\Delta H = \Delta E + P\Delta V]$ $\Delta H =$, uFkY ih ifjor0

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

bl sgh fxcI gYegkYV-t l ehdj .k dgrs g0

1/2vFk0k1/2

ΔG fdLkh jkLkk, kfukd vfHkf0, kk dh L0kRk% l0k0fRk0kk dh EkRk gS 0"Ek0k0fRk ds l0k0k0k fuk, k0k Lks $\Delta E = q + w$

$$q = \text{Rk0k } \}kj k \text{ v0k' k0s"0Rk m"Ek0}$$

$$\Delta E = \text{v0k0kfjd 0Tkkz lkfj 0kRk0k}$$

$$w = \text{Rk0k lkj fd, kk Xk, kk dk, kz g0}$$

...fn gEka fdLkh Rkæk }kj k fd, ks Xk, ks dk, kz dh Xk. kUkk djUkh gks Rkks w ds LFkkUk Ij &w YkSkk IkMjkk VRk%

$$\Delta E = q - w$$

$$q = \Delta E + w$$

Rkæk }kj k fd, kk Xk, kk dk, kz w IkLkkj dk, kz vksj vIkLkkj dk, kz nkskka dk, kkkk gSA vIkLkkLkj dk, kz ds mlk, kkkk dk, kz ds : Ik Eka Ikz kPRk fd, kk Tk LkdRkk gSA mLks vnkCk vk, kRkUk dk, kz mlk, kkkkh dk, kz dgRks gSA

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

Ij Rkq $w_{\text{exp}} = p\Delta V$ vLFkj nkCk Ij ½

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

fLFkj nkCk Ij , UfkZlkh Ijfj OkRkZk

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

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

fLFkj RkkIk Ij mRØEk. kh, k IkØEk ds fYk,

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

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

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

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

$$\Delta H - T\Delta S = \Delta G$$
 vLFkj RkkIk , Oka nkCk Ij ½

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 CkhPk d. Mj dYTk vkd" kz k nqkZk HkSRkd CkYk YkXkRkk gSA Tkks vR, kRk nqkZk CkYk gkRkk gSA

- 2- vf/k' kSk. k m"Ek dk EkkUk ½20 I s

jLkk, kfUkd vf/k' kSk. k &

- 1- bLkEka vf/k' kSk. k vksj vfHk' kSk. k ds CkhPk jLkk, kfUkd CkYk CkURks gS vksj mUkds CkhPk IkZkYk jLkk, kfUkd CkYk YkXkRkk gSA

- 2- vf/k' kSk. k m"Ek dk EkkUk ½20

40 kJ/mol⁻¹ dEk gkRkk gA

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

1 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 TkM/s 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 TkkRkk gA 3- ks vR,kRk vLFkk,kh gkRks gA
- 3- fØ | Øk vik?kVÎ dh vR,kRk dEk Ekk«kk Hkh buga LIkânRk dj nRkh gA
- 4- buK dkYkkbMh fØYk,kUkka ds d.k ds LkkFk fØYkk,kd ds d.k TkM/s Ukgha gkRks gA

mÙkj 14-

- 1- Ikks/S'k,kEk gDLkk Lkk,kukQjS/ II
- 2- gDLkk , Ekhuk dkskYV III ¶Ykj kbM
- 3- DYkkj kbM 3- Ikks/S'k,kEk V§/R vk,kkM/kEkj D,kjS/ II
- 4- V§/R , Ekhuk dkMkj 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 & UkyLkuk 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 gksh 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 gksh gA

mÜkj 16-

lkFkEk dksV dh vfHkfØ,kk ds fyk,ks nj fLFkjkd dk fuk/kkj .k lLkEk dYkuk dh fuk/k }kj k½

, d LkEkU, k 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, kkkkkRkh fØ,kk ds fuk, kEkkuq,kkj

^vfHkdjd dh vfHkfØ,kk dh XfRk mLkds LkfØ, k Ekk«kk ds LkEkkuqkkRkh 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{kkRkj djUks lkj

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

LkEk dYkuk 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 $[R] = [R]_0$ $\frac{1}{R_0}$ vfHkdj d dk Iktj fHkd Lkkæ.k $\frac{1}{2}$

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

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

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

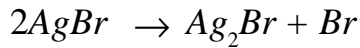
LkEkhdj .k (iii) vkj (v) Lks

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

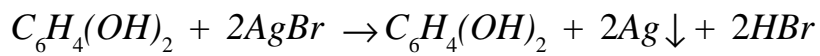
$$K = \frac{[R]_0 - [R]}{t}$$

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

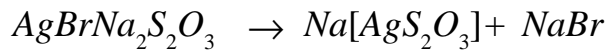
- 1- **mnHkkLkuk & dskjs ds Ykk dks OkLRq Ij dfaerK dj dN Lkd. M ds fyk, Ikdk'k MkYRks gS bLks mnHkkLkuk dkYk dgrks gA bLkLks OkLRq dk fPk«k IYk/ Ij vk TkkRkk gA**



- 2- **MSKYfIkKk djUkk & fDokkYk] IkkbjkYkYkYk gkbMfDokkKk ,kk fEKMYk dk {kjh,k ?kYk MSKYk Ij gRkk gS Tkksfd AgBr ds Ag Eka vIkPk,kuk dks IkwkZ dj nRkk gS bLkLks fUkXkSVok IkkIRk gRkk gA**

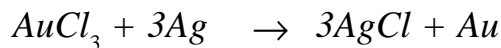


- 3- **fLFkjhdj .k & LkSM,kEk Fk,kkLKYQ/ %gkbIkks fOkY,kuk dk mlk,kkKk fUkXkSVok ds fLFkjhdj .k gRkqfd,kk TkkRkk gS vIkZkDRk AgBr gkbIkks Eka ?kYkdj vYkXk gks TkkRkk gA**



- 4- **fIkVXk & fIkVXk Iksj Ij fUkXkSVok ds }kjK Ikdk'k MkYkdj dN LkE,k ds fyk, j [kk TkkRkk gS fTkLkLks Iksj Ij OkLRq dh Lkgh fPk«k vfdRk gks TkkRkk gS fIkVXk Iksj Ij AgCl fTKYk/huk dk Ysk gRkk gA bLks /kksdj Lk[kk YkRks gA**

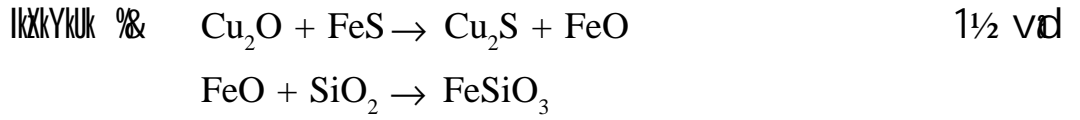
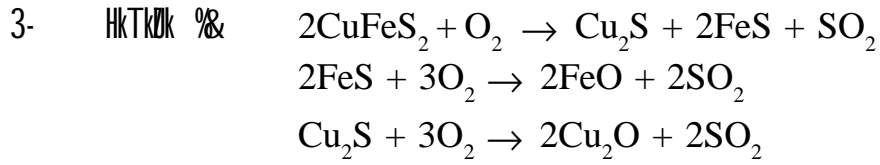
- 5- **VksukKk ,kk jKk Lkdj .k & dkYks LkQn fPk«k dks PkEdhYkK CkUKkUs gRkq AgCl₃ dk fOkY,kuk mlk,kkKk fd,kk TkkRkk gS fTkLks VksukKk dgrks gA**



1/2Fkok1/2

- 1- **v;Ld dk I# %& dkWkj IkkbjkbVhTk Cu₂S.Fe₂S₃ ,kk CuFeS₂ 1 vad**
- 2- **v,kLd dk Lkkae.k %& dkWkj ds LkYQkbM v,kLd dk Lkkae.k QSk mRiYkkOkuk fOkf/k Lks fd,kk TkkRkk gA IkhLks gq v,kLd CuFeS₂ dks IkkUkh Lks Hkjs gkT'k Eka MkYk fn,kk TkkRkk gS RkRkUPkRk PkM ,kk ,kdkSYkIVek dk RkYk MkYkdj Okk,kq dh RkYk /kjk IkdkfgRk djUks Ij v,kLd OkkXk ds Aikj RkRk gA fTkLks vYkXk dj fyk,kk TkkRkk gS vks v'kf) ,kka UkhPkS CkB TkkRk gS buk dks vYkXk dj fyk,kk TkkRkk gA**

1 vad



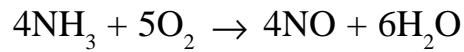
4- Ekv ds ?kvñ D₃kkkLk LKYQkbM RkFkk QjLk LKYQkbM gñ 1 vñ]
 (Cu₂S + FeS)

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

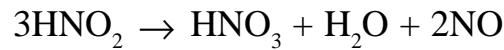
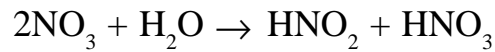
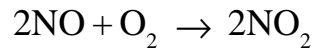
mÜkj 18

vkL VokkYM fñf/k Lks UkbfVñl vEYk ds fñkEkkz k dk fLk) kñk

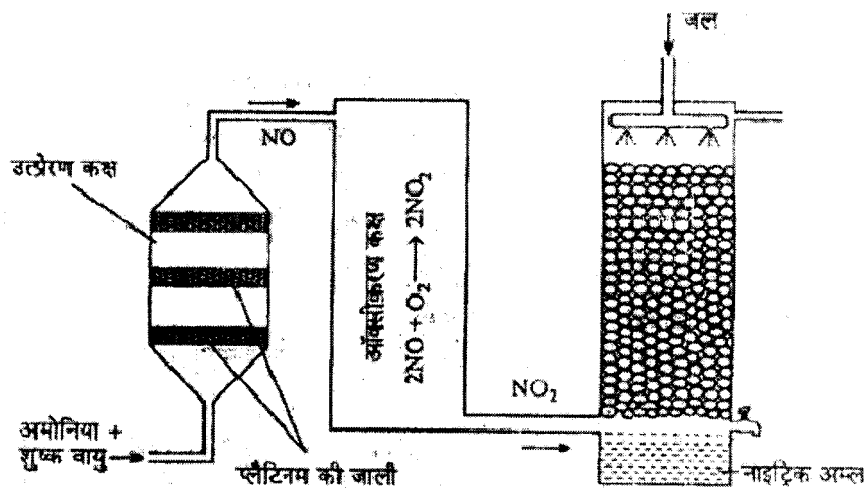
1 vk₃kñkuk vEkkñU₃kk vkñ 8 vk₃kñkuk Ok₃kq dk fEkJ.k Pt dh TkYkh ds Ålkj 800 808°C RkkIk Ikj IkñkfgRk fd₃kk TkRkk gS Rkks 90 IkRk' kñk vEkkñU₃kk dk UkbfVñl vkDLkkbM Eka vkDLkhdj.k gks TkRkk gñ



TKYk fEYkkUks Ikj UkbfVñl vEYk CkURkh gñ



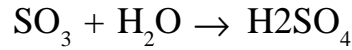
UkkEkkñdRk fPk«k %&



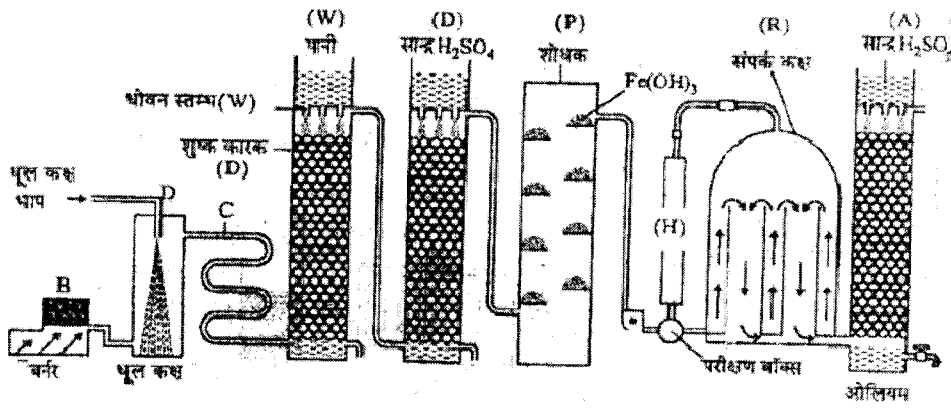
1/4 FkOkk 1/2

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

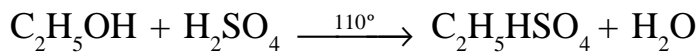
'kq) , Oka 'kqd SO₂ RkFkk Okk₃q ds fEkJ. k dks mRlkj d v₂O₅ lkj lkOkkfgRk dj Uks Lks Okg SO₃ Eka vkLkhNRk gks TkRkk gS Tkks TKYk Lks fØ₃kk dj ds H₂SO₄ OkkRkk gS



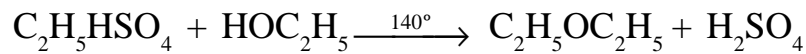
UkkekfdRk j[kfpk<k



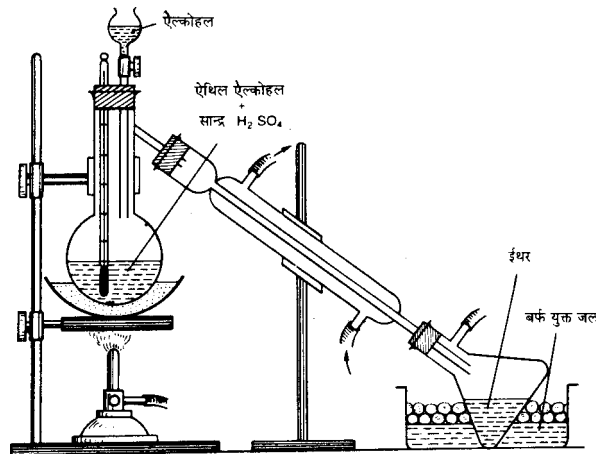
mUkj 19- 1/4 1/2 lk₃kkk'kkYkk Eka Mkb, fFkYk bFkj OkkUks dh fOkf/k dk jkLk₃kfUkd I ehdj.k



, fFkYk vYdkgYk



1/2 1/2 UkkekfdRk fPk<k &

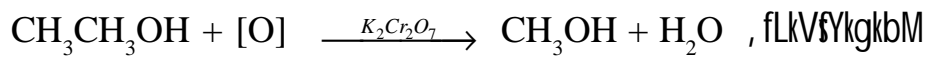


1/2 1/2 fOkf/k dk Lk{kRk Ok. kZk & vkLkOkk ¶YkkLd Eka 100ml lkj 'kq) C₂H₅OH , Oka

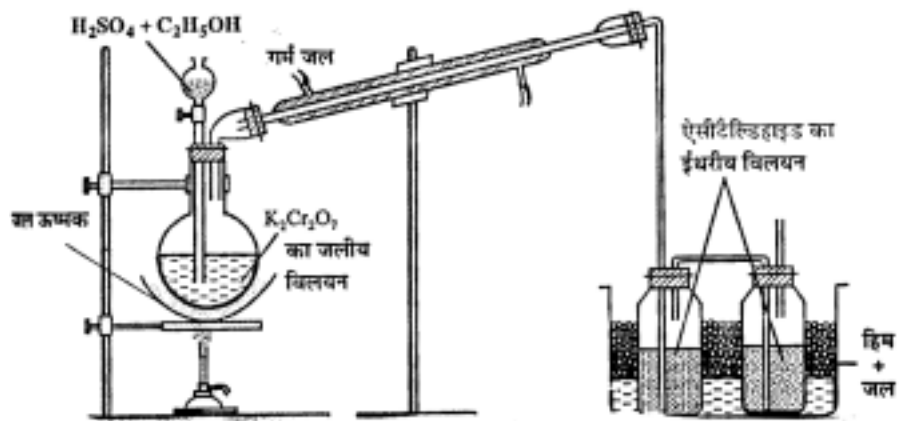
50ml Lkæ H_2SO_4 Ykdj CkYkw Å"Ekd lkj XkjEk djRks gS Rkklk $140^\circ C$ lkj j [kk TkkRkk gSA CkQZ fEKYks TkYk Lks j [ks gq Xkkg h ¶YkkLd Eka bFkj , d«k dj fYk_kk TkkRkk gA

¼/FlkKk½

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



½½ UkkEkKfdrk fPk«k &



½½ fof/k dk l 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 dj UksLks'k) , LkVfYMgkbM lkkRk gkRkk gA

½]2]2 vcl½