

2016

# JKU FOKKU

ifke izu i =

I KEU; VLS VDKZUD JKU

I e; %3%5 feuV

iwked 35

funzk % i k j EHK ds 15 feuV i j h { k k f k z ka d k s i z u & i = i < u s d s f y , f u / k k z j r g a

ukv/ & 1- I Hkh izu vfuok; ZgA i R; d izu dsfu/kkzjr vad muds l e { k f n ; s x ; s g A

2- x.kukRed izuka ea x.kuk ds l e Lr in Li "V : i l snhft ; A

3- izuka ds i k l f x d m R r j g h f y f [ k ; A

4- t g k ; v k o ' ; d g k j k l k ; f u d l e h d j . k n h f t ; A

1- bl izu ds i R; d [k.M eapkj fodYi fn; sx; sg] l gh fodYi p q d j m l s v i u h m R r j & i f l r d k e a f y f [ k ; A

d/2 3d<sup>3</sup> fudk; ds n i j s b y d v k u d h p k j k a D o k a / e l d ; k v k a d k l g h l s / g &

i) n = 3, l = 3, m = + 3, s = + 1/2

ii) n = 3, l = 2, m = + 2, s = + 1/2

iii) n = 3, l = 2, m = - 1, s = + 1/2

iv) n = 3, l = 2, m = 0, s = - 1/2 1

[k/2 i j e k u k d Y q ; f i j d , f l M e a l Y Q j d h v k D l h d j . k l d ; k g a 1

(i) + 6 (ii) - 6 (iii) + 3 (iv) - 3

x/2 Be, B, C, N r Fk O r R o k a d s i F k e v k ; u u f o h k o d k l g h O e g s & 1

i) B < Be < C < O < N ii) B < Be < C < N < O

iii) Be < B < C < N < O iv) Be < B < C < O < N

?k/2 SF<sub>6</sub> ea l Y Q j d k l d j . k g s & 1

(i) Sp<sup>2</sup>d<sup>3</sup> (ii) Sp<sup>3</sup>d<sup>2</sup> (iii) Spd<sup>4</sup> (iv) S<sup>2</sup>p<sup>2</sup>d<sup>2</sup>

M/2 n k s l d ; k v k a 2-781 r Fk 15-001 d s x q k u Q y e a l k F k z d v a k a d h l d ; k f d r u h g k s x h A 1

(i) rhu (ii) pkj (iii) i kp (iv) N%

2- d/2 fuEu ; k f x d k a d s l w f y f [ k ; A

(i) g D l k , e h u l y s / h u e (iv) D y l k j k ; M

(iii) M k b z D y l k j k ; V k s V s / k e h u d k s k Y V (iii) v k ; u 1/2 + 1/2

[k- v E y h ; o " k k z D ; k g s \ 1

x- d k s y j k m ' k f u ; e d h 0 ; k [ ; k d h f t ; A 1

- ?k- no dh ' ; kurk ij rki o nkc ds i Hkko dks l e>kb; A 1
- 3- d½ ml xYosuh l sy dks fpr dhft ; sft l eafuEufyf [kr vfhkfØ; k gkrh g& Zn (s) + 2 Ag+ (aq)-----> Zn++ (aq) + 2 Ag (s) 1
- [k½ CO<sub>2</sub> ds 4-4 xte ea eksy ks dh l [ ; k Kkr dhft ; A 1
- x½ vkn'kz x\$ l ehdj .k eaokUMj okYI us^vk; ru l akksku\* dksfdl idkj fu: fir fd; kA 1
- ?k½ vkstk u ijr ds vo{k; Deplition l svki dk D; k vfhki k; gA 1
- 4- dY vk; ju dsfulrki r v; Ld dk ixyu tc okR; k HkVvH eadjrsg\$ rksbl ds fofHkUu {ks=kaeagksusokyh døy jkl k; fud vfhkfØ; kvkadk mYys [k dhft ; A1
- [k½ ^20 vk; r H<sub>2</sub>O<sub>2</sub>” l sD; k vfhki k; gA bl l sml dh l kUnrk xte i fr yhVj eacrk b; A
- x½) fuEu vfhkfØ; k eadkj .k l fgr vi pk; d crkbz s Cl<sub>2</sub>(g) + 2 Br<sup>-</sup> (aq) -----> 2Cl<sup>-</sup> (aq) + Br<sub>2</sub> (aq) 1
- ii) , d rRo dsckg; dks k dk vyDVkfud fol; kl 4s<sup>2</sup>up<sup>5</sup> gSbl rRo dk i wkz byDVkfud fol; kl fy [kdj i jek.kqØekad crkb; A 1
- ?k½ d{k d D; k gS\ p vkchWYI dh fofHkUu vkdfr; ka dk fp=.k dhft ; A2
- 5- d½ dkj .k crkb; s%&
- i) cjlfy; e Be dk vk; uu fohko ckjksu B l svf/kd gA 1
- ii) mi l gl a kst d ; kfxd eayhxSM Ligands D; k gkrsgS\ , d mnkgj .k ndj crkb; A
- [k½ i) yBFksuk; M+ D; k gS\ 1
- ii) l Øe.k rRo vupqdh; xqk inf'kr djrsgSD; ka\ a) /kkfRod idfr b) vupqcdh; xqk 1/2 + 1/2 = 1
- x½ fl yhdki l D; k gS\ buds xqkka dk mYys [k dhft ; A 2
- ?k½ vUrj gSykst u ; kfxd D; k gkrsgsbudk oxhdj .k d\$ s djrsgA 2
- 6- D; k gkrk gS tc & %døy vfhkfØ; k dk l ehdj .k nhft ; %
- i) vfØLVyh; ckjksu xfy r l kM; e gk; MkdI k; M l svfhkfØ; k djrk gA 1
- ii) l YQj dks dklLVd l kMk foy; u ds l kFk xez djrsgA
- iii) vkFkkQkLQkjd , fl M dks xez djrsgA 1

vFkok

I e>kb; s&

i) i kbZ ckUM ( $\pi$ ) fl Xek ckUM ( $\sigma$ ) dh rnyuk ea nqzy gS 1

ii) vdkcZud cft hu D; k gS\ 1

iii) I kekU; rki ij H-F nD gS tcfD HCl xS

7- iz kx'kkyk ea 'kD) vkstku cukus dh dkbZ, d fof/k uekfdr fp= I fgr nhft; A  
vkstku dh fuEu I svfhkfo; kvk ds dDy jI k; fud I ehdj.k nhft; A

i) vEyh; LVBI Dykj; M ii) vEyh; Qjkl YQV

vFkok

I Yq; fjd, fl M dsfueZk dh ^I Ei dZfof/k\*\* dk dDy uekfdr fp=, oafI ) kUr  
nhft; A

D; k gkrk gS tc rkca dh Nhyu I kUnz H<sub>2</sub>SO<sub>4</sub> ea Mkyh tkrh gA 03

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2016

# JKU FOKKU

f}rh; izu i=

## HMSrd rFlk dkcud jI k; u

I e; %3%5 feuV

i wkked 35

fun7k % i kjEHk ds 15 feuV ij h{kkfFk; ka dks izu&i= i <us dsfy, fu/kkZjr gA

ukV & 1- I Hkh izu vfuok; ZgA iR; d izu dsfu/kkZjr vad muds l e{k fn; sx; sgA

2- x.kukRed izuka ea x.kuk ds l eLr in Li"V : i l snhft; A

3- izuka ds ikl fxd mRrj gh fyf[k; A

4- t gk; vko'; d gk; jkl k; fud l ehdj.k nhft; A

1- bl izu ds iR; d [k.M eapkj fodYi fn; sx; sg\$ l gh fodYi pUdj ml svi uh mRrj&i fLrdk ea fyf[k; A

d½ 0.001 N H<sub>2</sub>SO<sub>4</sub> foy; u dk pH eku gksk 1

(i) 5 (ii) 2 (iii) 3 (iv) 11

[k½ H<sub>3</sub>PO<sub>4</sub> ds 1M foy; u dh ukeZyrk gS& 1

i) 0.5 N (ii) 1 N (iii) 2N (iv) 3 N

x½ , fl i u gS& 1

i) , l hfVy l syhfl fyd , fl M (ii) 2& feFkDI h catks d , fl M

iii) , l hfVy vkDt fyd , fl M iv) feFk; y cstks d , fl M

?k½ fuEu vfHkfØ; k fdl oKkfud ds uke ij gS& 1

i) 2 HCHO + NaOH (50%) -----> CH<sub>3</sub>-OH+HCOONa

(a) oVZt vfHkfØ; k (b) dkYcs vfHkfØ; k

(c) ijfdu vfHkfØ; k (d) dshhtkjs vfHkfØ; k

M½ I kSM; e Dykj kbM fØLVy ea Na+ vk; u dh l ello; I [; k gS& 1

i) 6 (ii) 8 (iii) 4 (iv) 1

2- d½ 0; uk&S ds fuekZk ds fy, jkl k; fud vfHkfØ; k dk l ehdj.k nhft; A 1

[k½ gkekl D; k gA 1

x½ ek=d dks'kdk dks fdl h , d mnkgj.k l s i jHkkf"kr dhft; A 1

?k½ 0°C ij 5% ; f; j; k foy; u ds ijkl j.k nkc dh x.kuk dhft; A 1

S = 0.0821 yhVj ok; e.My@fMxh@eky

- 3- d½ , UFKY i h vlsj vkuvfjd Åtkl ea D; k l EclU/k gS\ 1  
 [k½ fdl h , d jkl k; fud vfhkfØ; k l sLi "V dhft; sfd Xyudkst ea - CHO l emj mi fLFkr gÅ 1
- x½ uk; yk& & 66 D; k gS ; g dS scuk; k tkrk gÅ 1
- ?k½ fudk;  $2A(g) + B(g) \rightleftharpoons 3C(g)$  dsfy, l kE; fl Fkjkd dk eku crkb; Å1
- 4- d½ vfhkfØ; k dh dksV D; k gS\ i Fke dksV vfhkfØ; k dsfy, v/k vk; pky 0-6932 l dM gSbl vfhkfØ; k dsfy, osx fLFkjkd dh x.kuk dhft; Å 2  
 [k½ i) , Utkbe mRij .k dk , d mnkgj .k nhft; Å  
 ii) Ldnu rFk i sVhdj .k ea, d&, d varj crkb; Å 1\$1
- x½ i) icy vEy rFk icy {kj dh vfhkfØ; k eamnl huhdj .k m"ek dk eku l n& 13-7 K. Cal D; kajgrk gÅ 1  
 ii) AB i&kj dsyo.k dsy, foyş rk rFk foyş rk xqkuQy dk l EclEk fyf[k; Å 1
- ?k½ i) feFk; y Dykj k; M H<sub>3</sub>C-Cl ea gS/vsYfVd fonyu inf'kr dhft; Å 1  
 ii) fuEu dkcud ; k&sd ; ye dks l h l eko; rk inf'kr djrs gS vlsj D; ka  
 a)  $\text{CH}_3 - \text{C}(\text{O}) - \text{CH}_2 - \text{CH}_3$  & (b)  $\text{CH}_3 - \text{C}(\text{OH}) = \text{CH} - \text{CH}_3$   
 O OH 1
- 5- d½ csthu] nks ds d y s l = ka dk vuqkn l d j gS Li "V dhft; Å 2  
 [k½ dS si klr djsxs\  
 i) cat hu l sVh, u-Vh  
 ii) , fl fvYhu l s, l hvYMhgk; M 1+1 =2
- x½ , fFky , Ydkgy l s Dykj k QkeZcukus dh fof/k ea i z, Ør jkl k; fud vfhkfØ; kvka ds l ehdj .k fy [kdj] Dykj k QkeZdh KOH dh mi fLFkr ea Qhuky l sfØ; k fyf[k; Å 2
- ?k½ i) , fFky , eh u , d {kj ds: i ea D; ks 0; ogkj djrk gÅ  
 ii) uk; Vkcsthu dk vEyh; ek/; e l svip; u vfhkfØ; k; afyf[k; Å 1+1=2
- 6- d- i) fuEufyf[kr vfhkfØ; k dks i wkZ dhft; s rFk mRrj i qlrdk eafy [kdj A rFk B ; k&sdka ds uke crkb; s  

$$\text{CH}_3\text{COOH} + \text{N}_3\text{H} \xrightarrow[\text{xel djus ij}]{\text{Conc. H}_2\text{SO}_4} \text{A} \xrightarrow{\text{HNO}_2} \text{B}$$
 1  
 [k- Qhuky vlsj , fFky , Ydkgy nksuka es-OH l emj mi fLFkr gS i jUrQ Qhuky vEyh; gS tcf d , fFky , Ydkgy mnkl hu gS Li "V dhft; Å 1

x- i kFked] f}rh; d rFkk r}rh; d , Ydksyka ea foHksn djus dsfy, , d  
jkl k; fud ijh{k.k nhft ; A 1

7- iz kx'kkyk ea 'kq) , I hVksu cuksu dh fof/k dk ukelidr fp= jkl k; fud vfHkfØ; kvka  
ds I ehdj.k I fgr nhft ; A

vFkok

D; k gksrk gS tcf d % dny I ehdj.k nhft ; s &

i) Qhuksy dks I kUnz  $\text{HNO}_3$  rFkk I kUnz  $\text{H}_2\text{SO}_4$  ds feJ.k ds I kFk xeZ djrs gA

ii) QkeV Mhgk; M veksu; k I sfØ; k djrk gA

iii) cst V Mhgk; M] I kSM; e , I hV/ dh mi fLFkr ea, I hfVd , ugk; M<sup>+</sup> M I svfHkfØ; k  
djrk gA 3

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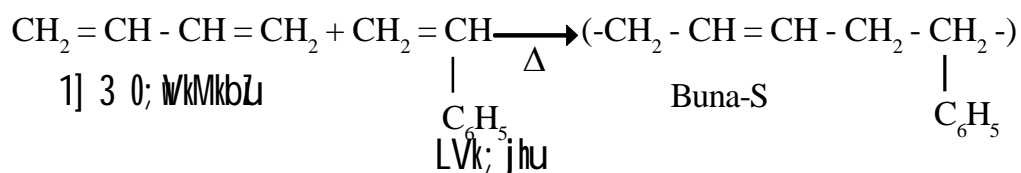
## j l k; u&foKku

f}rh; izu i =

1. "cgfodYi h; iz uk&ds mRrj\*\*"
  - (d) (iii) .....3
  - ([k) (iv) .....3N
  - (X) (i) ....., l hfVy l SyhfI fyd , fl M
  - (?k) (d) .....d&htkjka vfHkfØ; k
  - (M) (i) .....6

- 2- ½d½ 0; wk&s j c j d fueZk dsfy, j l k; fud l ehdj .k  
0; wk&s dk jkl k; fud uke %&

### LVk; j hu 0; WkMkbZ j c j (SBR)



¼[k½ gkek&l &

^os i nkFkZ tks 'kj hj dsfdl h Hkkx l smRI ftZr gkrk gS rFkk vU; LFkku i j

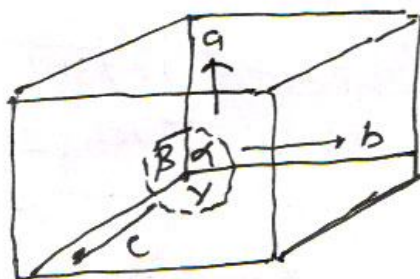
fdl h fof'k"V mi ki p; h fØ; k dks fu; ã=r djrk g\$ gkek&l dgykrs g& \*\*

gkek&l 'kcn dk iz kx l oZ Fke starling (1905) usfd; k FkA

### ½k½ek=d dks'kdk UNIT CELL

\*\*I Ei wkZ fØLVy l j p uk dh og Nk/h l s Nk/h bdkbZ tks fofHku fn'kkvka ea l eku  
: i l sckj&ckj i qjkoFRr ij fØLVy l j p uk dks i q% mRi lu dj nrh g\$ ek=d dks'kdk  
dgykrh g& \*\*

ek=d dks'kdk dh i gpk u N% foHkkvka vFkZr fd ukj ka, Ø fd ukj ka ds e/; dks kka a,  
b, c, α, β rFkk λ l sgksrh g&



### 1/2 k/2 v d k Red i z u dk gy

5% ; f i j ; k dk v F k z g s 100 ml ea 5 gm ; f i j ; k  
; f i j ; k ds e k y k s dh l d ; k =  $\frac{w}{m} = \frac{5}{60}$

i z u k u d k j

$$T = 0 + 273 = 273 \text{ K}$$

$$S = .0821 \text{ y h V j ok; } \phi M y h @ f M x h @ e k y$$

$$V = 1 \text{ y h V j}$$

$$n = 5/60 \text{ e k y}$$

fo y ; u l e h d j . k -----  $PV = nST$

$$P = \frac{n}{V} ST$$
$$= \frac{5/60}{1} \times .0821 \times 273$$
$$= 18.67 \text{ ok; } \phi M y$$

3- 1/2 d 1/2 , U F K Y i h v k j v k r f j d A t k z ds l E c U / k

### v k r f j d A t k z E

f u f ' p r i f j f l F k r ; k a e a f d l h f u d k ; dh l E i w k z A t k z / k a d k ; k s x v k l r f j d  
A t k z d g y k r k g a

### , U F K Y i h H

f l F k j n k i j ^ f d l h f u d k ; dh v k r f j d A t k z E r F k n k & v k ; ru A t k z  
P V ds ; k s x d s c j k c j g k s h g a \*\*

E r F k H e a l E c / k f u E u l e h d j . k } k j k i n f ' k z f d ; k t k l d r k g a

$$\Delta H = \Delta E + \Delta nRT$$

$\Delta n =$  v f h k f O ; k e a H k k x y u s e k y k a dh l d p k e a i f j o r u

$\Delta H =$  , U F K Y i h i f j o r u

$\Delta E =$  v k r f j d A t k z i f j o r u

R = x s f u ; r k a d

T = i j e r k i

1/4 k k y v d k l e a , d -CHO l e g m i f l F k r g s &

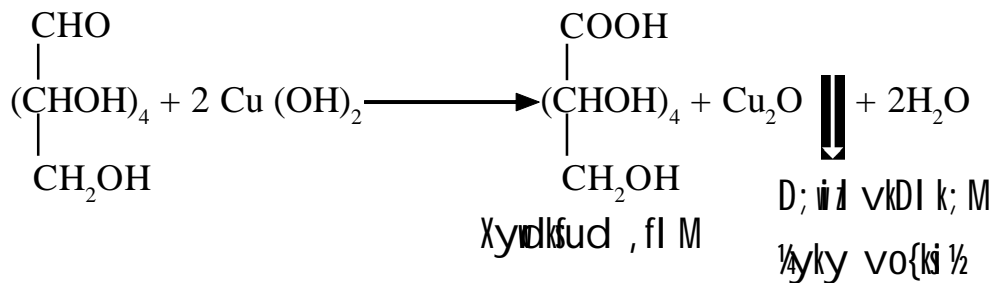
b l dh i q ' V X y v d k s t dh f u E u v f h k f O ; k l s dh t k l d r h g a

, Y M h g k ; M dh r j g X y v d k s t dk v k D l h d j . k r h o r k l s g k s h g s v r % ; g , d



vi pk; d dk dk; l djrk gA ; g vekudhy fl Yoj ukbVW ¼/kyu vfHkdeB½ rFkk  
 Ogfyx foy; u dks vi fpr dj nrk gA-----

Ogfyx foy; u l s Xydkst dh vfHkfØ; k -----



**(x½uk; yk & 66**

; g , d l akkuu cgyd gsftl ea- C - NH - fydst ik; k tkrk gA  

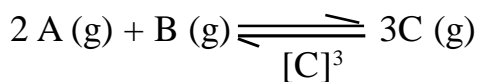
$$\begin{array}{c} \text{O} \\ || \\ \text{C} \end{array}$$

, Mhfi d , fl M rFkk gDI k efkyhu Mkbz , ehu ds l kFk vfHkfØ; k gks i j curk gA



mi ; ks & Vjhyhu ds oL = cukuseami ; kxh gA

3 (?k½ fuEu x½ h; fudk; %



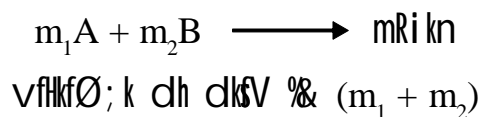
$$K_c \text{ ¼ KE; fl Fkj kd½} = \frac{[\text{C}]^3}{[\text{A}]^2 [\text{B}]}$$

t gk [A], [B] rFkk [C] Øe' l% A, B rFkk C ds l fØ; nØ; eku gA

**4- ¼d½ vfHkfØ; k dh dksV**

afdl h jkl k; fud vfHkfØ; k ea vfHkfØ; k ds ox dks fu/kkZjr djus oyks vfHkd kj d

v. kq/ka dh dgy l q; k dks vfHkfØ; k dh dksV dgrs gA\*\*



**x. kukRed gy**

i Fke dksV vfHkfØ; k ds fy, %

$$k = \frac{0.6932}{t_{1/2}}$$

i zukuq kj %

$$t_{1/2} = 0.6932 \text{ l jM}$$

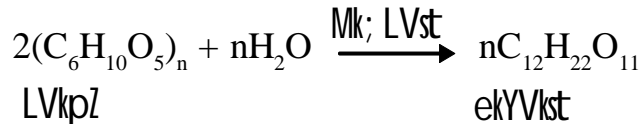
$$v_r\% k = \frac{0.6932}{0.6932}$$

$$= 1 \text{ i fr l dM}$$

1/2 (1) , Ut k; e & mRi j . k %

mngj . k %

v d i j r t i s } k j k m R i k f n r M k ; L V s t , U t k ; e L V k p z d k s e k Y V k s t ' k D d j e a i f j o r r r d j n r k g a



(ii) L d n u r F k k i s V h d j . k e a v l r j

L d n u	i s V h d j . k
<p>t c f d l h d k y k ; M f o y ; u e a f o / k r</p> <p>vi ? k V ; f e y k ; k t k r k g S r k s d k y k i M h</p> <p>d . k f o / k r m n k l h u g k d j v k o f { k l r g k s</p> <p>t k r s g S ; g f O ; k L d n u d g y k r h g a</p> <p>m n k g j . k</p> <p><math>As_2S_3 \xrightarrow{Ba^{++}} As_2S_3</math></p> <p>- SOL <span style="margin-left: 100px;">m n k l h u</span></p>	<p>r k t s c u s v o { k i d k s m i ; O r f d l h f o   r v i ? k V ;</p> <p>I s i u % d k y k ; M h f o y ; u e a i f j o f r r d j u s d k s</p> <p>i s V h d j . k d g r s g a</p> <p>m n k g j . k %</p> <p><math>Al(OH)_3 \xrightarrow[\text{mckyusij}]{\text{dieHCl ds l kFk}} Al(OH)_3</math></p> <p>I O n v o { k i <span style="margin-left: 150px;">I O n d k y k ; M</span></p>

1/2 i c y v E y r F k k i c y { k k j d h f O ; k e a &

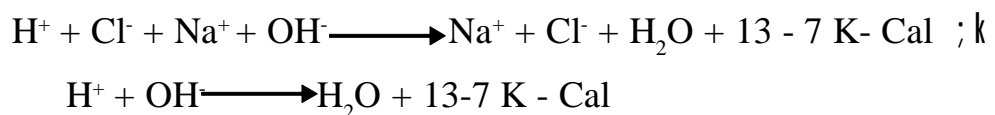
m n k l h u d j . k m " e k d k e k u l n b 13.7 K C a l j g r k g a

**d k j . k %**

D ; k f d i c y v E y r F k k i c y { k k j d k v k ; u u i w k z i l s g k s t k r k g a f t l l s

i k l r f o u ; u e a % [H+] = [OH-]

**m n k g j . k %**



(II) A B i d k j d s y o . k d s f y , f o y ; r k r F k k f o y s r k x q k u Q y e a l a d k

4 1/2 (ii)  $AB \rightleftharpoons A^+ + B^-$

e k u k A B d h f o y s r k s e k y @ y h V j g S v k s ; g f o y ; u e a i w k z ; i l s v k ; f u r g l s

t k r k g S r c

$$[A^+] = S e k y @ y h V j$$

$$[B^-] = S e k y @ y h V j$$

foys rk xqkuQy dsvuđ kj

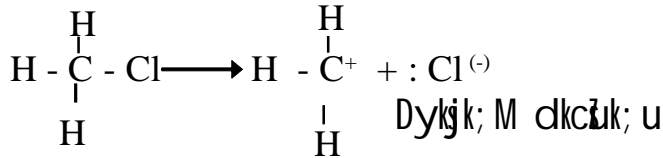
$$K_{sp} = [A^+] [B^-]$$

$$= 5 \times 5$$

$$K_{sp} = S^2$$

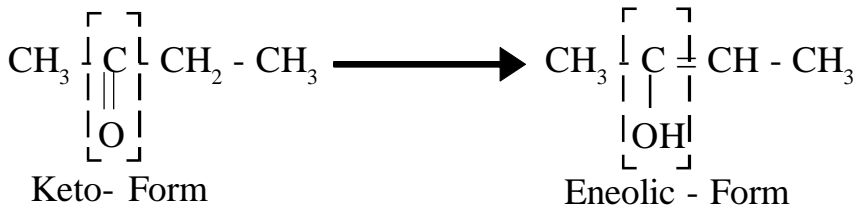
$$S = \sqrt{K_{sp}}$$

(i)  $CH_3 - Cl$  e agVkyVd fonyu

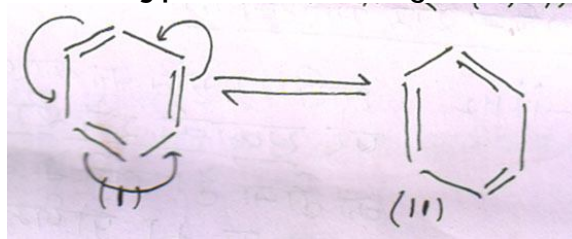


$ECl > EH$  e fky; e vk; u

(ii) izu eafn; s x; s dkcžud ; e dVkybžky I Hko; ork 1/2 pykoork 1/2 inf'kr djsrgA fuEu fp=.k I s; g Li "V gA

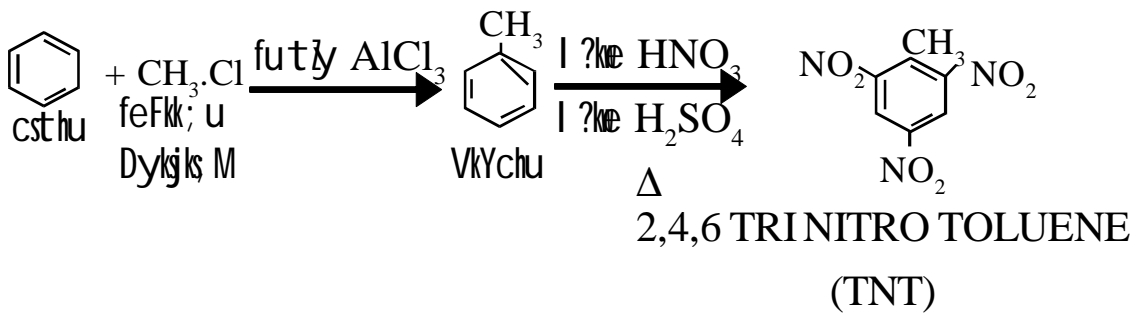


5- 1/2 o k fud d dyauscathu I j puk dsfy, pykoi oh ifjdYi uk nhA ft I ds vuđ kj cathu dsf}cU/k fLFkj ughagks cfyd yxkrkj xfr djsrgsgS vr%csth u fuEu nks I j pukvka dk feJ.k gA

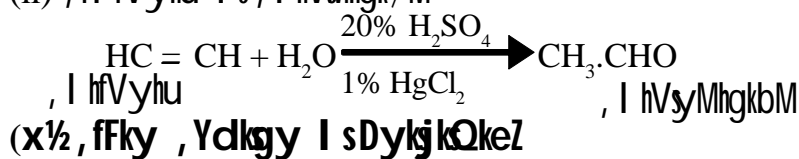


1/2 s iklr djsx&

(i) cathu I sVh-, u-Vh-

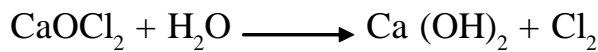


(ii) , fl fVyu l s , l hVhMhgk; M



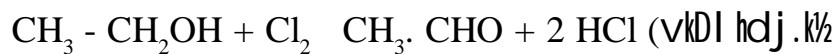
(x½, fFky , Ydkgy l s DykjkQkeZ

, fFky , Ydkgy dk tc Cyhfpæ i kmMj ds l kFk xeZdj rsgSrks; g fØ; k fuEu i nka ea i wKz gkrh gA

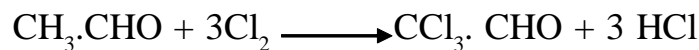


Cyhfpæ i kmMj

eÞr Dykjhuj bFki y , Ygky dk vkDI hdj .k , l hVhMhgk; M ea djrh gA



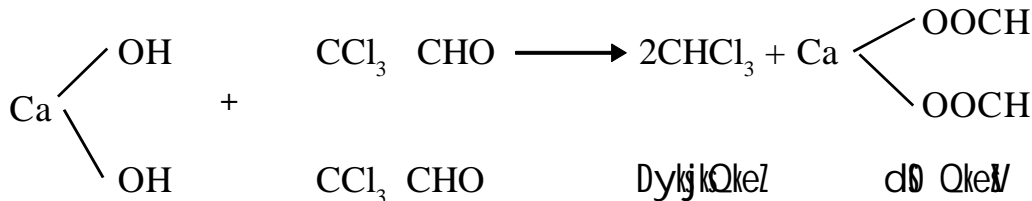
; gh eÞr Dykjhuj , l hVhMhgk; M ds -CH<sub>3</sub> l eg dk Dykjhuhdj .k dj Dykji cukrh gA



Dykji y

½Dykjhuhdj .k½

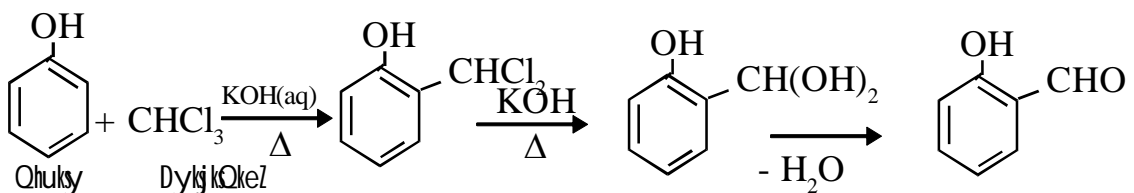
; g Dykji Ca(OH)<sub>2</sub> ds }kjk ty vi?kVr gkdj DykjkQkeZ nrk gA



DykjkQkeZ

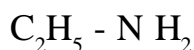
dØ QkeZ

KOH dh mi fLFkr ea Ohuky dh fØ; k DykjkQkeZ ds l kFk



½k½ (i) , fFky , eh , d {kjk ds: i ea

l Syhfl r , yMhgk; M



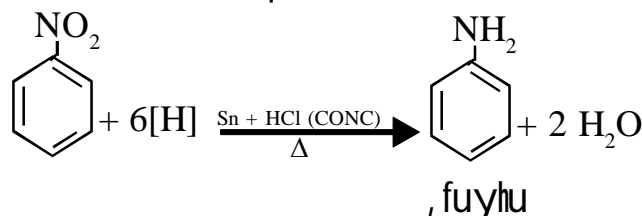
{kjh; iZfr dk dkj .k ukbVrstu i jek.kqij , dkdh

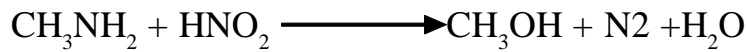
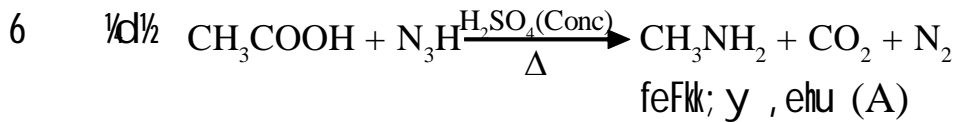
byDVks; ; ðe dh mi fLFkr dk gksuk gA bl h ds dkj .k

, Ydk; y l eg dk + I ijf.kd i Hkko vf/kd gkrk gA

(ii) uk; Vksathu dk vEyh; ek; e ea vip; u

tc uk; Vksathu dksfVu /kkrqrFk l kUnzHCl ds l kFk xeZdj rsgSrks, fuyhu i kr gkrk gA

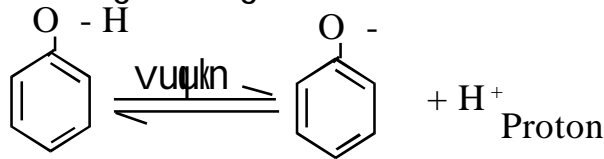




; kfxd A \_\_\_\_\_ feFkk; y , ehu feFkk; y , Ydksy (B)

; kfxd B \_\_\_\_\_ feFkk; y , Ydksy

][kVQuksy ds vk; hudj.k l s i kVksu H+ mRiUu gkrk gs vks cuk fQukDI k; M vk; u vuqkn ds }kjk LFkk; h gks tkrk gA



$\text{C}_2\text{H}_5\text{OH}$  mnkl hu gkrk gs i jUrqi kVksu H+ xg.k djusdh i dfr dsdkj.k ctuLVSM cd vks  $\text{C}_2\text{H}_5\text{-O-H}$  ds vkdI ht u i jek.kqij mi fLFkr , dkdh byDVksu ; Ye dsdkj.k Y; b l cd dh rjg dk; Zdjrk gA

$\frac{1}{2}$  i kFkfed] f}rh; d rFk rrh; d , Ygdksy eafoHkn

Y; vdkl i jh{k.k ds }kjk fd; k tkrk gA

**Yv dkl vfhkdeD %**

; g l kUnz HCl vks futy  $\text{ZnCl}_2$  dk 1 % l feJ.k gkrk gA

; g vfhkdeD foHku , Ydksy ka ds l kFk fHku&fHku xfr l s vfhkdeD; k djds vfoys , ldk; y Dyk; M cukrk gA

**fof/k %**

iR; d , Ydksy dk fuf'pr vk; ru vyx&vyx ij [k uyh ea ydj iR; d ea Y; vdkl vfhkdeD dk fuf'pr vk; ru feykrsgA

**fujh{k.k %**

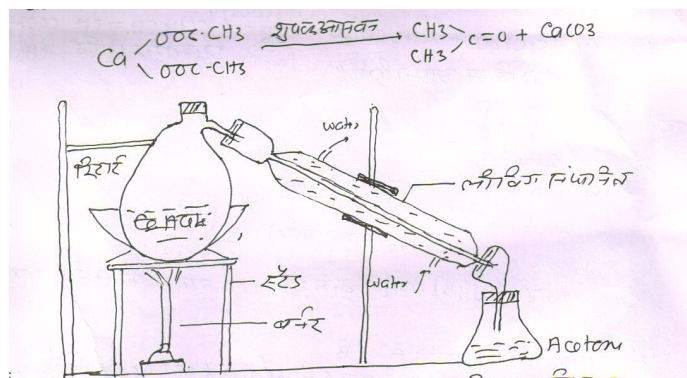
1- ; fn 'kh?k l Qn vo{ki vkrk gS rks rrh; d , Ydksy

2- ; fn 3&5 feuV ckn l Qn vo{ki rksf}rh; , Ydksy

3- ; fn dkbZ vo{ki ugha vkrk gS rks i kFkfed

**7- i z kx'kyk ea'kd , l hVksu**

dsYl ; e , l hV/ dk 'kd vkl ou djus ij



'kksku %&

i klr , I hvksu ea I kSM; e ckbZ I YQk; V foy; u feyk dj fgykrsgSft I I s, I hvksu I kSM; e ckbZ I YQk; V dsfØLVy i klr gkrsgSft lga Nkudj vyx dj yrsrgA

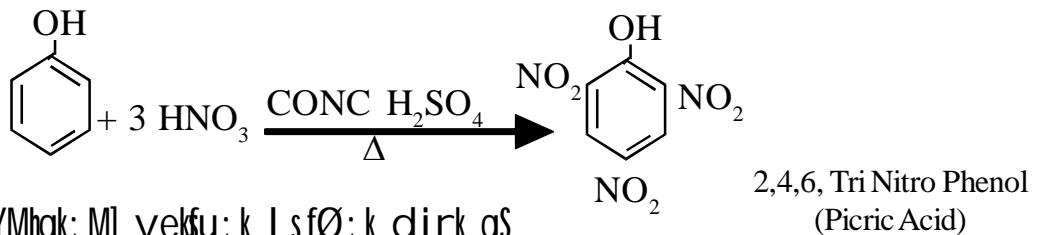
bl fØLVyka dks I kSM; e dkcku/ ds I arlr foy; u ds I kFk vkl ou djus ij yxHkx 'kq) , I hvksu i klr gkrk gA

vHkh Hkh bl eaty dh vYi ek=k gkrh gsft I snij djusdsfy, futy CaCl2 Mky nrsrgSckn ea Nkudj CaCl2 dks i klr dj nrsrgSrfk 'kSk nØ dk vkl ou 56°C ij djus ij 'kq) , I hvksu i klr gkrk gA

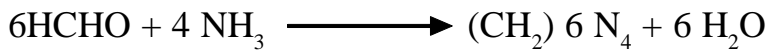
vFkok

D; k gkrk gs tcfD -----

1- Qhuksy dks I kUnz HNO<sub>3</sub> rFk I kUnz H<sub>2</sub>SO<sub>4</sub> dsfeJ.k ds I kFk xel djrs gA

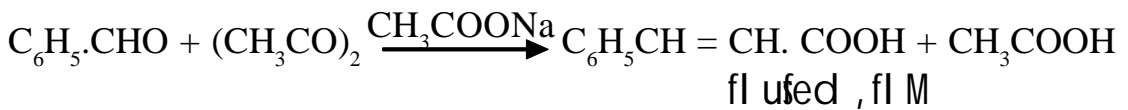


2- QkeY Mhgk; Mj veksu; k I sfØ; k djrk gS



gDI k esFkyhu gs/kehu ¼ jks/ki hu ½

3- cat Y Mhgk; Mj I kSM; e , I hvS/ dh mi fLFkfr ea , I hfVd , ugk; Mk; M I s fd; k djrk gA



----- ^i jfdu vfHkfØ; k\* -----

## ji k; u&foKku

i Fke izu i =

I kekU; vksj vdkcZud ji k; u

1/4 1/2 d 1/2 -----(iii)

$$n = 3, e = 2, m = -1, s = +1/2$$

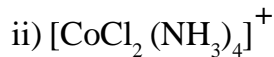
[k 1/2 -----(i) + 6

X 1/2 ----- (i) B < Be < c < N < O

?k 1/2 -----(i) Sp<sup>2</sup>d<sup>3</sup>

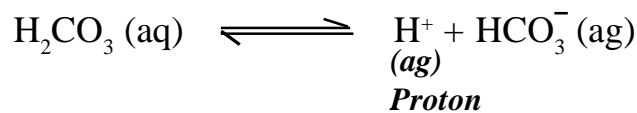
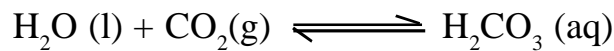
M 1/2 -----(iv) N%

2 d 1/2 ; kfxdkads I w&



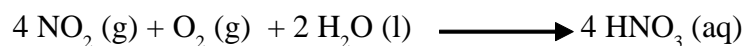
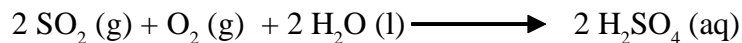
[k 1/2 vEyh; o"kkZ (ACIDIC.RAIN)

'kq) ty dh pH 7 gkrk gS i jUr qo"kkZ ds ty dh pH yxHkx 5-6 gkrk gS D; kfid o"kkZ dk ty ok; qeMyh; CO<sub>2</sub> ds I kFk fØ; k djds dkckZud vEY cukrk gA



vr% ^tc dHkh Hkh o"kkZ ds ty dh pH 5.6 I sde gks tkrh gS rks ; g o"kkZ vEY o"kkZ dgykrh gS

vksj kfxd {k=kq} ÅtkZ I a=kS I smRi lu gkusokys vksj N ds vKDI kbM ok; qe.Myh; vKDI htU o ty I sfØ; k djds I Yq; fijd , fl M rFkk ukbfV'd , fl M cukrsg% tks vEyh; o"kkZ ds iæqk dkj.k gA



vEyh; o"kkZ I sl tho futHb nksuka gh i Hkkfor gkrsgA

x 1/2 dkyjkm'k

dkyjkmI usI u-1875 evullr ruqk ij fo | r vi ?kV; kadsfoY; kuka dh rY; kadh; pkydrk dks I e>kusdsfy, , d fu; e ifrikfnr fd; kj ftI ds vuq kj&

^vullr ruqk ij fdl h fo | r vi ?kV; dh rY; kadh pkydrk dk eku vk; fud pkydrkvka dseku ds ; kx dscjkj gkrk gS

$$A^{\infty} = A_c^0 + A_a^0$$

$A^{\infty}$ ----- vullr ruþk ij rþ; kadh þkydrk

$A_c^0$ ----- vullr ruþk ij /kuk; u dh vk; fud þkydrk

$A_a^0$ ----- vullr ruþk ij \_\_.kkRed vk; fud þkydrk

dkykjkm'k us vius fu; e l s; g Hkh fu"d"lz fudkyk fd vurr ruþk ij iwkz fo; kstu ij iR; d vk; u fo|q vi?kV; dh rþ; kadh þkydrk ea, d fuf'pr ; ksnku djrk gþ ftl s----- vullr ruþk ij vk; fud þkydrk dgrsgþ

**?k½nð dh ' ; kurk ij rki , oankc dk iHko**

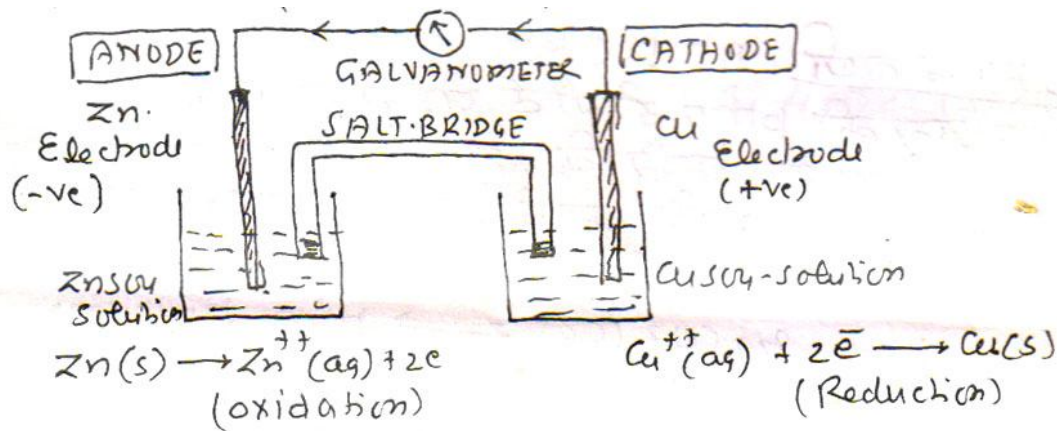
**' ; kurk ij rki dk iHko**

rki c<kusij nð dh ' ; kurk ?kVrh gSD; kfid rki c<kusij l Øe.k Åtkzc<rh gð

**' ; kurk ij nkc dk iHko**

nkc c<kusij nð dh ' ; kurk c<rh gþ D; kfid nkc c<kusij fjDr LFku ?kV tkrsgþrFkk nð ds v.kþ/ka dks Hke.k djuse adfBukbz gksh gþ bl h dkj.k vf/kd nkc ij nð d fBukbz l scgrk gþ vkþ' ; kurk dk eku Hkh c<+tkrk gð

**3- d½xþofud l y dk fp=.k%**



[k½ eksyka dh l ; k =  $\frac{\text{Hkkj } \frac{1}{2} \times \text{ke e} \frac{1}{2}}{\text{xte v.k} \frac{1}{2} \text{kkj}}$

izukuþ kj ----- CO<sub>2</sub> dk Hkkj xte ea 4.4  
 ----- CO<sub>2</sub> dk v.kþkkj cjkj 12 \$ 32  
 ¾ 44

vr% eksyka dh = 4.4/44 = 0.1 eksy

x½ v.kþ/ka ds fuf'pr vkdkj rFkk fuf'pr vk; ru ds dkj.k ckUMjoky us, d l ákkku dkjd 0; Dr fd; k ftl softþ vk; ru dgrsgð



okLrfod xS ka dsfy, I akks/kr vk; ru fuEu izdkj g&

, d eksy xS dsfy, -----

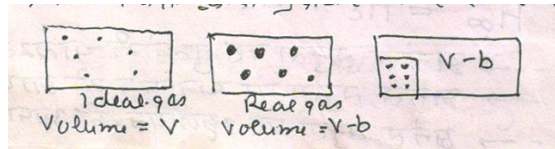
I akks/kr vk; ru = V-b

xS ds n eksy/ka dsfy,

I akks/kr vk; ru = V-nb

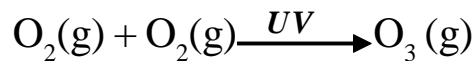
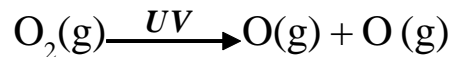
okLrfod xS ds oftr vk; ru rFkk I akks/kr vk; ru dks fuEu dks fuEu fp= }kj k

inf'kr dj I drsg&-----



?k½ vkstk u ijr dk vol ;

I erki eMy eavkstk u dk fuelzk , d I rr-fuelzk I rr-ifØ; k gS



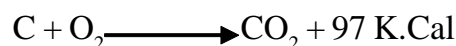
- yfdu fQj Hkh vkstk u I erki eMy eavf/kd ek=k ea, df=r ughagk i krh] bl dk dkj .k ; g gSfd I erki e.My eavkstk u dk ikdfrd : i I srFkk euq; ka }kj k ok; e. My eafuxr j l k; ukads }kj k {k; gsrk jgrk g& ok; e. My eavkstk u ds {k; dks vkstk u ijr dk vo{k; dgrsg&

vkstk u ijr dk vo{k; e[; : i I suk; fv³d vkDI kbM] i jek.kfod vkDI ht u rFkk gk; MRSDI y enydk ds mi fLFkr ds dkj .k gsrk g&

Dyjk kfykj k dkcZu Hkh vo{k; dk dkj .k g& bl h ds dkj .k vkstk u fNnz curs g& 4-d½ okR; k HkVh ea vk; ju ds fuLrkfi r v; Ld dk izxyu rFkk ml ea gkus okyh i e[ k jkl k; fud vfHkfØ; k ea fuEu pkj {k=ka ea foHkfr gS

### i) ZONE OF COMBUSTION ngu [k.M

; g HkVh dk I cl sfupyk Hkx gsrk gSft I dk rki yxHkx 1500&1600°C gsrk g& bl Hkx eadkd dk ngu gsrk g&



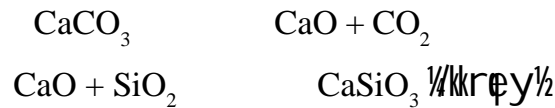
### ii) ZONE OF FUSION xyr [k.M

bl [k.M dk rki yxHkx 1200&1300°C gsrk gSbl h Hkx ea C,S,P, Si, Mn vkfn

dh v'ki) ; ka ds dkj.k vk; ju 1300°C ij fi?ky tkrk gS vkj HkVh ds i'ns ea PIG-IRON dPpk ykjk ; k <yok ykjk ds : i ea ikr gkrk gA

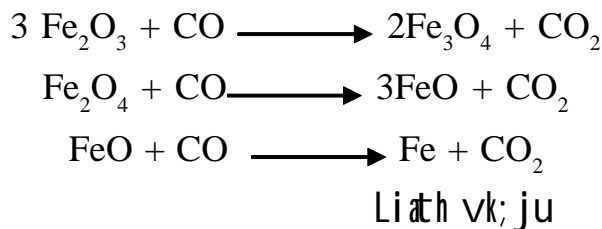
**(iii) ZONE OF SLAG /kkrepy [k.M**

/kkrepy [k.M ; g HkVh dk e/; Hkx gkrk gSftl dk rki 800&1000°C gkrk gA bl [k.M eafuEu izdkj /kkrepy curk gA



**iv) ZONE OF REDUCTION vip; u (k-**

; g HkVh dk Ajh Hkx gkrk gSftl dk rki yxHkx 400&700°C gkrk gA bl [k.M ea CO xj Fe<sub>2</sub>O<sub>3</sub> dk vip; u Li'nh ykjk eadkrk gA



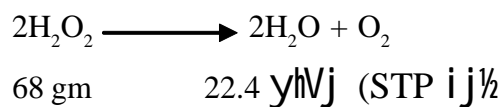
**[k½ ^20 vk; ru H<sub>2</sub>O<sub>2</sub>”**

dk vfHkik; gSfd ^1ml H<sub>2</sub>O<sub>2</sub> ds iwZvi?kVu l s STP ij 20ml vkDI ht u xj ikr gkrh gA\*\*

**^20 vk; ru H<sub>2</sub>O<sub>2</sub>” dh l khrk**

1 ml H<sub>2</sub>O<sub>2</sub> foy; u l s STP ij ikr O<sub>2</sub> = 20 ml  
 1000 ml H<sub>2</sub>O<sub>2</sub> foy; u l s STP ij ikr O<sub>2</sub> = 20x1000 ml  
 = 20000 ml  
 ¾ 20 yhVj

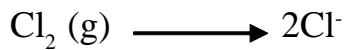
H<sub>2</sub>O<sub>2</sub> dk vi?kVu fuEu izdkj gkrk gS



22.4 yhVj O<sub>2</sub> STP ij ikr gkrh gS = 68 gm H<sub>2</sub>O<sub>2</sub> l s  
 %20 yhVj        \*\*        \*\*        = 68x20/22.4 xte H<sub>2</sub>O<sub>2</sub> l s  
 = 60.71 xte H<sub>2</sub>O<sub>2</sub> l s

vr%20 vk; ru H<sub>2</sub>O<sub>2</sub> foy; u dh l khrk = 60.71 xte@yhVj

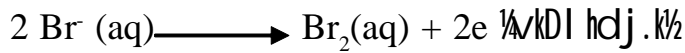
1/2 x 1/2 1/2 fn; s x; s l ehdj .k dks fuEu v/kz vfHkfØ; k; ka ea foHkkftr djus ij



; k  $\text{Cl}_2 + 2\text{e}^- \longrightarrow 2\text{Cl}^-$  1/2 vi p; u 1/2

D; kfd  $\text{Cl}_2$  nks byDVku xg.k dj vi fpr gks jgk gS

vr%; gka  $\text{Cl}_2$  vkDI hdki d gksck



D; kfd  $\text{Br}^-$  byDVku R; kx dj vkDI hdr gks jgk gA vr%  $\text{Br}^-$  vi p; d gksck

B(ii)  $1\text{S}^2, 2\text{S}^2 2\text{P}^6, 3\text{S}^2 3\text{P}^6 3\text{d}^{10}, 4\text{S}^2 4\text{P}^5$  ----- i wkz foll; kl pfid

pfid dgy byDVku ksdh I 4; k 35 gS vr% rRo dk ijek.kq Øekad 35 gksckA

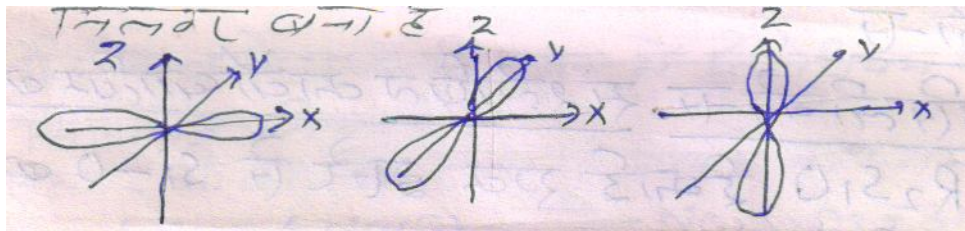
**1/2 d {kd ORBITALS**

^fd l h ijek.kq ukfHkd dspkjkavkj dk og f=foe {ks= ft l eabyDVku i k; stkusdh I okz/kd l EHkkouk gksrh gS ijek.kq d {kd dgykrk gS

, d d {kd eafoi jhr pØ.k ds vf/kdre nks byDVku l EHko gA

**p--vkfcl/y dh vkdf;r; kag&**

, d p&mi dksk rhu p&d {kd ksp<sub>x</sub>, p<sub>y</sub>, p<sub>z</sub> l sfeydj cuk gA



5- d 1/2

(i) cjhfy; e Be dk vk; uu foHko ckjku B l s vf/kd D; ks

4 Be	2, 2	1s <sup>2</sup> 2s <sup>2</sup>	
		<span style="border: 1px solid black; padding: 2px;">1L</span> <span style="border: 1px solid black; padding: 2px;">2L</span>	----- स्थायी वि-यास (2s <sup>2</sup> पूर्ण भर है)
5 B	2, 3	1s <sup>2</sup> , 2s <sup>2</sup> 2p <sup>1</sup> 2p <sup>0</sup> 2p <sup>2</sup>	
		<span style="border: 1px solid black; padding: 2px;">1L</span> <span style="border: 1px solid black; padding: 2px;">2L</span> <span style="border: 1px solid black; padding: 2px;">1</span> <span style="border: 1px solid black; padding: 2px;"> </span> <span style="border: 1px solid black; padding: 2px;"> </span> <span style="border: 1px solid black; padding: 2px;"> </span>	----- अस्थायी वि-यास

t kshk vkoh/YI ; k rks vk/ksHkjs gks; k i wkzHkjs gks muds fol; kl LFkk; h gksrgS vr% bul s byDVku fudkyus ds fy, vf/kd Åtkz dh vko'; drk gksrh gA

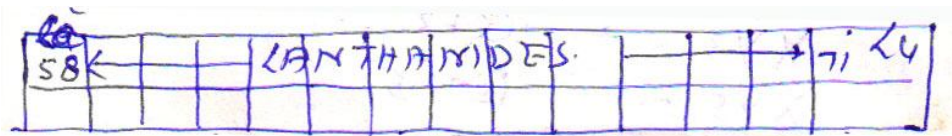
**(ii) mi l gl a kst d ; ksd eayh xMI**

og vk.kfod vFkok vk; fud Li l ht tks l dj ; ksd eadbnh; /kkrq ijek.kq vFkok vk; u l s LFkk; h : i l s t q/h gksrh gS yhxMI dgykrh gA

mnkgj .kkFkZ &K4 {Fe (CN)6} ea CN- vk; u yhxšM gSD; kšd ; g l d j ea dšnh; - Fe++ vk; u l s tšMk gšz

yhxšM dšnh; /kkrq l s mi l gl a kst d cl/k }kjk tšMk gšrk gš ; s mnkl hu rFkk \_\_.kkRed nksuka gks l drsgš

[K<sub>2</sub>(i) yšFkuk; MI & ^i jek. kšØekš 58 l s 71 dsrRo yšFkuk; M Jskh dsrRo yšFkuk; M+ ; k 4f Jskh dsrRo ; k ngyšM enk rRo dgykrk gš

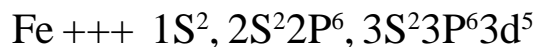
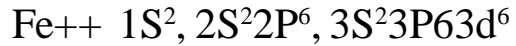
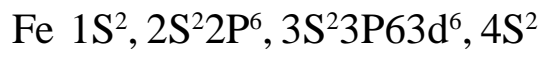


yšFkuk; M Jskh ea byšVku 4f sub shell ea Hkjrs gš

**(ii) l Øe.k rRo dk vupšdh; xqk**

l Øe.k rRo vupšdh; xqk inf'kr d jrs gSD; kšd buds d- orbital's ea v; Øer byšVku gšrs gš

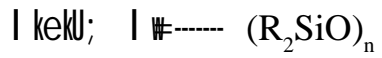
mnkgj .k&



; s l Hkh vupšdh; xqk inf'kr d jrs gSD; kšd buds 3d vkohš/y ea v; Øer byšVku gš

**xšfl yhdšl -**

fl yhdšl l šyš'kr dkoš /kkRod cgyd gš buea R<sub>2</sub>SiO bdkbz , d nš js l s Si - O cl/k }kjk tšMh jgrh gš



tgkaR = , fyd ; k , f j y l eš

pšd budk l kekl; l # dhVku ds l kekl; l # R<sub>2</sub>CO ds l eku gš bl hf y , ; šfl yhdšl dgykrsgš

**xqk %&**

- 1- fl yhdšl jš[kh; ] 'kk[kk; Ør ; k pØh; gks l drsgš
- 2- budk m"eh; LFkkf; Ro cgyr vf/kd gšrk gš bl hf y , blga "mPp rki cgyd" Hkh dgk tkrk gš
- 3- 473 k rd xel djk; s tkus i j Hkh ; s LFkk; h rFkk vok"; 'khy gšrs gš
- 4- jkl k; fud nš"Vdsk l šfuf"Ø; gšrs gš

**½vurj gSystu ; kSxd**

gSystu ijLij fØ; k dj l kell; l # XYn idkj dsftu ; kSxdakd fuekZk djrs gð vrj gSystu ; kSxd dgYkr gð

XY = fHkUu gSystu i jek.kq

n = , d i wkkZd gSftl dk eku 1] 3] 5] 7 gkrk gð

x = gSystu dk vkdkj y gSystu ds vkdkj l scMk gkrk Gð oxhZdj.k

xy .....CIF

Xy3 .....CIF<sub>3</sub>

Xy5 .....BrF<sub>5</sub>

XY7 ..... IF7

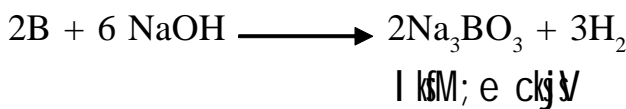
**l kell; y{k.k %&**

1- l gl a ktd rFkk ok'i 'khy gkrsgð

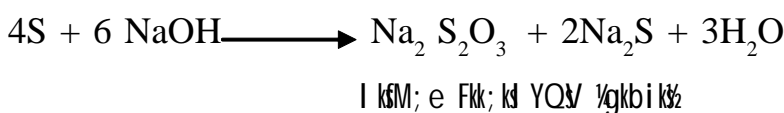
2- idfr ifr pædhi; gkrh gð

6- D; k gkrk gS tc &

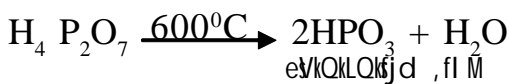
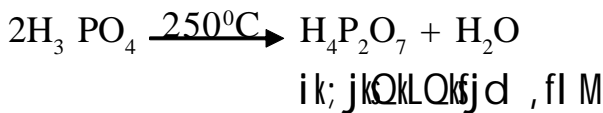
1- vfØLVyh; ckjktu xfyr l kSM; e gk; MKDI k; M l s vfHkfØ; k djrk gð



2- l YQj dks dkfLVd l kMk foy; u ds l kFk xel djrs gð



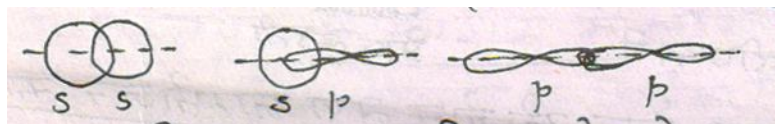
3- vkFkkQkLQkjd , fl M dks xel djrs gð



vFkok

(i) **ikZokUM fl Xek ckUM dh rgyuk eançy gS**

tc nks vk/ksHkjs vkchV/Yka ds v{k; vfr0; ki ual stkscl/ kcurk gSog fl Xek ckUM dgYkrk gð



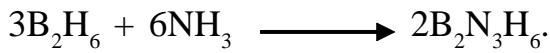
**Li "Vhdj .k**

fl Xek cl/k cuusea i jek.kfod vkchV/uka dk vfr0; ki u vf/kdre gkrk gS tcf d i kbZ cl/k cuusea i jek.kfod vkchV/uka dk vfr0; ki u vkf' kd gkrk gA

**(ii) vdkcfud csth**

MkbZ ckf su veku; k ds l kfk l a Dr gkdj

$B_2H_6 \cdot 2BH_3$ ; kskRed ; kfxd cukrk gA tks mPp rki ij ckjktky cukrk gA

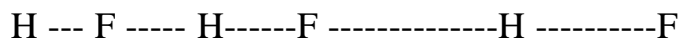


1/ckjktk 1/2

pfid ckjktky dh l j puk csth ds l eku gkrh gA vr%l svdckfud csth jgrs gA

**(iii) l kkl; rki ij HF nD gS tcf d HCl xS**

H-F ds l eku v.kqvUrj v.kpd gkbMkst u cl/k ds dkj .k , d nll jsdh vkj vkdf'kr jgrsgS vr%; kfxdka ds v.kv/ka l xqku dh fLFkr jgus ds dkj .k nD gA



tcfd HCl eabl idkj dk gkbMkst u cl/k ugha gkrk vj osfoyx jgrs gA

**7-'k) vstkuskus dh fof/k %**

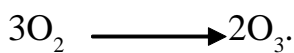
iz ksk'kkyk ea vstkuskus dk fuekZk fuEu nks idkj ds vktkuktjka }kjk fd; k gA

1- l hesu dk vstkusk; tj

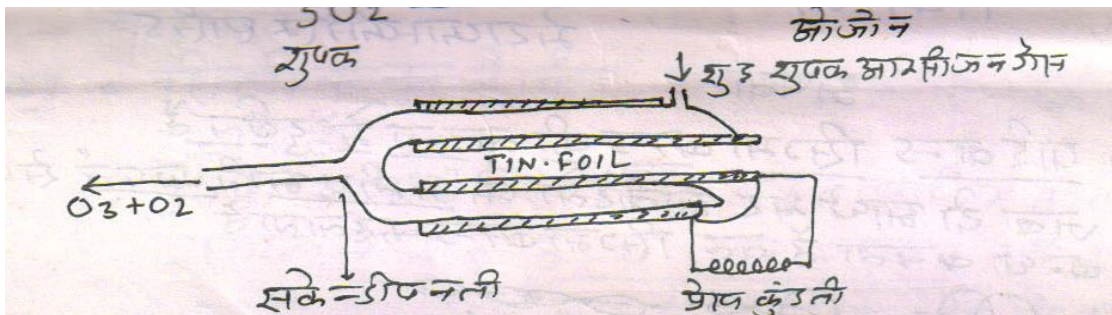
2- ckMh dk vstkusk; tj

**l hesu dk vstkukt ; j**

'khd vkDI ht u xS eauhjo fo | r fol xZ i dkfgr djus ij



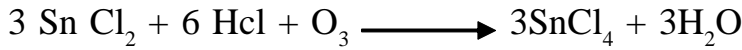
'khd vstkuk



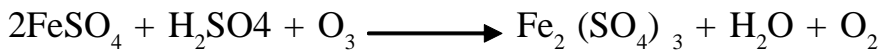
bl fof/k l smRiUu xS vstkuk rFkk vkDI ht u dk feJ.k gkrk gS ft l ea vktkuk yxHkx 15% gkrk gA

'kksku %&

vkstkahdr vkDI htu dks nfor ok; qea BMk djrs gA - 119°C ij vkstku xgjs uhysjak dsno ea ifjofr r gk tkrh gsrFkk vkDI htu xS h; voLFkk ea 'kksk jg tkrh gA uhysno dk l ko/kuhi d d ok"i u djus ij yxHkx 100% 'kq vkstku i klr gk tkrh gA vkstku dh vEyh; SnCl<sub>2</sub> ds l kfk vfHkØ; k



vkstku dh vEyh; FeSO<sub>4</sub> ds l kfk vfHkØ; k



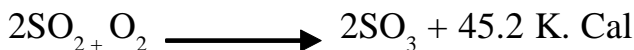
Osjd l YQV

vFkok

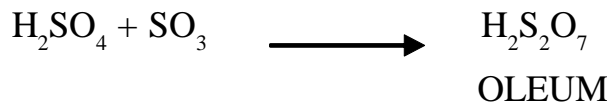
l Yq; fjd , fl M dsfuekzk dh l Ei dzfof/k

fl ) klr %&

- 1- 'kq) vkj 'kqd SO<sub>2</sub> rFkk ok; qdsfeJ.k dks 450°C rki ij lys/hue , LcLVI ; k csuSM.; e i k vkDI kbM l kUnz (mRi j d 1/2 dh mi fLFkr ea 2 ok; qea Myh; nkc ij idkfr djus ij SO<sub>3</sub> i klr gk r h gA



- 2- SO<sub>3</sub> dks l kUnz H<sub>2</sub>SO<sub>4</sub> ea vo'kks"kr djus ij i k; jkd Yq; fjd , fl M (OLEUM) i klr gk r k gA



- 3- OLEUM ea ty dh mfr ek=k feykus ij l kUnz H<sub>2</sub>SO<sub>4</sub> i klr gk r k gA



vfHkdkj dkdh 'kq) rk

vfHkdkjd SO<sub>2</sub> rFkk ok; q dk feJ.k 'kq) gksuk pkfg, s D; kd /kny ds d.k rFkk vki sud vkDI k; M mRi j d dsfy, mRi j d fo" k dk dk; Z djrs gA

l a = dk j [kd r fp=

