

CLASS – X

vEy/ {kjd, oayo.k
ACID, BASE & SALT

(v) *dN vEy LokLF; ij cjk izHk Myrs gA*

izu 5- {*lkj dsikp xqk dksfy/l*

*m*lkj & {*lkj dsxqk fuufyf/kr g%*

- (i) *buck Lokn dMek glrk g*
- (ii) ; *s l kcp t sfpdus glrsg rFlk Ropk dks glfu igpkrsg*
- (iii) ; *syky fyVel dksulyk dj nrsg*
- (iv) ; *sgYnh dsjæ dksHyk yky dj nrsg*
- (v) ; *svEyk dsl kfk fØ; k djdsyo. k rFlk ty cukrsg*

izu 6- {*lkj dsmi; lx crlo*

*m*lkj & {*lkj dsmi; lx fuufyf/kr g%*

- (i) *bl dk mi; lx l kcp cukuseafd; k t lrk g*
- (ii) *blga {lkj; cVj; laeiz Ør fd; k t lrk g*
- (iii) *buck mi; lx iVky fjQlbfuæ vlf dkxt m/lx eaz Ør glrk g*
- (iv) *dBkj ty dksenqcukuseabl dk mi; lx fd; k t lrk g*

izu 7- *vEY rFlk {lkj eavaj Li "V dj*

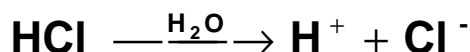
*m*lkj & *vEY rFlk {lkj eafuufyf/kr varj g%*

<i>vEY</i>	<i>{lkj</i>
(i) <i>bl dk Lokn /KVk glrk g</i>	(i) <i>bl dk Lokn dMek glrk g</i>
(ii) ; <i>g uhysfyVel i= dksyky dj nrk g</i>	(ii) ; <i>g yky fyVel i= dksulyk dj nrk g</i>
(iii) ; <i>g ty eafosy glkj glbM u vk u (H⁺) nrk g</i>	(iii) ; <i>g ty eafosy glkj glbM lbM vk u (OH⁻) nrk g</i>
(iv) ; <i>g {lkj d dksmkl hu dj nrk g</i>	(iv) ; <i>g vEY dksmkl hu dj nrk g</i>
(v) <i>bl dkpH eku 7 l sde glrk g</i>	(v) <i>bl dkpH eku 7 l svfæcl glrk g</i>

izu 8- *vlggsul }kjknhxbZvEY rFlk HLe dhifjHk nk n*

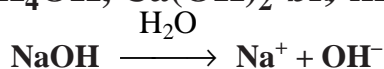
*m*lkj & *vEY* & *vEY* og *inkfZgSt ksty ea?lydj glbM u vk u (H⁺) inku djrk g*

t s s HCl, H₂SO₄, HNO₃, CH₃COOH *br k nA*



HLe & *HLe* og *inkfZgSt ksty ea?lydj glbM lbM (OH⁻) vk u nrk g*

t s s NaOH, KOH, NH₄OH, Ca(OH)₂ *br k nA*



izu 9- vk uhdj. k ds vlekj ij vEyladk foHkt u fdu oxkææfd; k t krk gS¹ o. kã dja

mũkj & vk uhdj. k ds vlekj ij vEyladk foHkt u nksoxkææfd; k t krk gS²

- (i) **izy vEy (Strong Acid)** – t k vEy ty ea?lydj yxHx i vLZ% vk fur ghdj gbmMt u vk u(H^+) izku dgrsg t s& gbmMdykjd vEy(HCl), ulbfVd vEy(HNO_3), l YÝ; fjd vEy(H_2SO_4) bR, kñA
- (ii) **nqZ vEy (Weak Acid)** – osvEy t k ty ea?lydj fl QZvLk'kd : i l s vk fur gkrs gS ml snqZ vEy dgrsg t s& dkkhnd vEy(H_2CO_3), , l hfVd vEy(CH_3COOH), nqZ vEy gS chjd vEy(H_3BO_3) Hh, d nqZ vEy gS ft l dk mi; kx , d h fVd ds: i ea gkrk gS

izu 10- foy; u eamifLFkr vEy dh ek=k ds vuq kj vEyladk foHkt u fdu oxkææfd; k t krk gS¹ o. kã dja

mũkj & fo; yu eamifLFkr vEy dh ek=k ds vuq kj vEyladk nksoxkææfd; k t krk gS²

- (i) **l kæ vEy (Concentrated Acid)** – t c foy; u eavEy dh vfekd ek=k mifLFkr jgrh gS rks ml s l kæ vEy dgrsg l kæ vEy eat y dh ek=k de jgrh gS
- (ii) **ruqvEy (Dilute Acid)** – t c foy; u eavEy dh ek=k de jgrh gS rks ml s ruqvEy dgrsg ruqvEy eat y dh ek=k vfekd jgrh gS

izu 11- vEy rFlk {kij ds vkgfsu; l fl) kR dh l hekvladk mYysk dja mũkj & vkgfsu; l fl) kR ds nk'k fuEufyf[kr gS²

- (i) bl fl) kR ds vuq kj vEy H ; Ør ; kxd gS vLg {kij OH ; Ør ; kxd gS yfdu dN, l s {kij gft ueOH ughnjgrk bu vEylarFlk {kij dh Q kj; k bl fl) kR ds vlekj ij ughndh t k l drhA
- (ii) æo vekfu; ke NH_4NO_3 dk vlpj. kvEylt gkrk gS bl dh Q kj; k bl fl) kR ds vlekj ij ughndh t k l drhA
- (iii) tyh foy; u eaHCl rks vEy ekuk t krk gS fda rqs l vofLFk ea; k vl foyk d t s& ea hu/2 eavEy ughnekuk t krhA

izu 12- vk uhdj. $k ds vlekj$ ij $HLeakdsfdrushkx$; $kg\%$ o. kz dja
 $mukj \& vk$ uhdj. $k ds vlekj$ ij $HLeakdsnksoxkx$; $kg\%$

- (i) **izy HLe (Strong base)**- $osHLe$ tkt ylt foy; u eai vk fur
 $gkdj$ $dkQh$ $ek=k$ $eaglbM$ lbM vk u (OH^-) inku $djrs g$ $ml s$
 $izy H'e$; $k izy$ $\{kij$ $dgrsg$ tS $NaOH$, KOH $izy H'e$ g
- (ii) **ngZ HLe (Weak base)** & $osHLe$ tkt ylt foy; u eaf QZ $vakr\%$
 vk fur $gkdj$ de $ek=k$ $eaglbM$ $lbM(OH^-)$ inku $djrs g$ $ml s$
 $ngZ HLe$; $k ngZ$ $\{kij$ $dgyksg$ tS $\&veku$; e $glbM$ lbM
 (NH_4OH) , $dS'k$ e $glbM$ lbM $Ca(OH)_2$ |

izu 13- **l pd (Indicator)** fdl $sdgrsg$; $sfdrusizlkj$ $dsgksg$ $ifjH'$ kr dja
 $mukj \& l pd$, s $inkfZ$ $gksg$ t ks $viusja$ $ifjorZ$ ds $\{kij$ $inkfZ$ ds $vEyl$
 $; k$ $\{kij$; k mkl lu $gkudh$ l puk $nsrg$
 rhu l $lekl$ $l pd$ $fyVel$ $i=$ $feFkby$ vkj rFk $Qhuk$ $QFkyu$ g
 $l pd$ dk $vEyl$ $\{kij$ $l pd$ Hh $dgrsg$
 $; snksizlkj$ $dsgksg\%$

- (i) **ikNfrd l pd** & **ikNfrd l pd** ds $varxZ$ $fyVel$ $i=$ rFk $gYnh$ $vkrs$
 g $pqlhj$ yky $xkHh$ i UkA
- (ii) **layf'kr l pd** & bl ds $varxZ$ $feFkby$ vkj rFk $fQuk$ $QFkyu$ g

izu 14- **xg fufeZ l pd** vki dS s cuk xs

$mukj$ $\& gYnh$ ds NkV $\& NkV$ VqM $dkst y$ ds l kFk xje dj Nku $ysrg$ $gYnh$
 l $siHr$ foy ; u dk ns $vyx \& vyx$ ij $[kufy$; $keayrsrg$, d ij $[kuyh$
 eal kcq dk foy ; u $Myrsrg$ ij $[kuyh$ ds foy ; u dk i $lykja$ $yky \& Hjis$
 ja $eacny$ t $krkgs$ ft l l sl kcq ds $\{kij$ $gkudh$ $igplu$ $gkrg$ g $nWjs$
 ij $[kuyheaf$ jdk $Myrsrg$ fl jdk ij $[kuyheaf$ $[k$ foy ; u $dsja$ $eadkZ$
 $ifjorZ$ $ugladjrk$ $vr\%$ fl jdk $vEyl$ g

izu 15- $vEyl$ dh $'kDr$ ds $ckjs$ $eavki$ D ; k t $kursg$ fd $\& fdu$ $rjhd$ l s
 $vEyl$ dh $'kDr$ dh $ryuk$ dh t k l $drhgs$

$mukj$ $\& vEyl$ $dst ylt$ foy ; u $eavEyl$ $\{kij$ iHr $glbM$ u vk uad $hek=k$ l s
 ml dh $vEyl$ $'kDr$ dk $fueklZ$ k $gkrg$ g

निम्न तरीकों से अम्लों की तुलना की जा सकती है—

- (i) **$vEyl$ ds kr ds $vlekj$** & tS $\&dkZud$; kxd & i $lekl$ l $siHr$ $vEyl$
 $\& l$ $kbvEl$ $vEyl$ $vkut$ Syd $vEYA$

- (ii) *vl. od l'apuk ds vleljij ij vEj & glbM vEj & HCl, HBr, HI*
 (iii) *izy vEj ds vleljij ij & vEj t ylr foy; u esiwlz%vk fur glrk gSft l ds vk uhclj. k dk vak yxHx 100% glrk gA*

izu 16- yo. k fdl sdgrsgA ; sfdrusizlj dsgrsgA ifjHf'kr djA mUlj & yo. kos; l'xd gSft udkfuekzkfdl hvEj dkfdl h{kljd dsvfHfO; k dsQyLo: i glrk gS, oaft l eavEj v. kqds; l'xd eami fLFkr glbM u i jek kqfdl h ekkq}kjk foLFHf'ir glrk gA

mnl hulclj. k vfhfO; k eadkZvEj fdl h{kljd dsl kfk vfhfO; k dj yo. k, oat y cukrk gA

tS s&l kM, e glbM kM, oaglbMdykjd vEj dsmnl hulclj. k vfhfO; k eal kklj. k ued yo. k, oat y cukrk gA



yo. k dsizlj fuEufyf'kr gA&%

- (i) *I kkl' yo. k (Normal Salt) & og yo. k ft l l svk ulNfr H i jek kq; k glbM d l y l eg ughajgrk gS ml sl kkl' yo. k dgrsgA ; g vEj , oafHle dsiwlzmnl hulclj. k dsQyLo: i curkgA tS NaCl, HCl, NaNO₃, Na₂SO₄ br' knA*

- (ii) *vEylr yo. k (Acidic Salt) & fdl h vEj ds v. k eami fLFkr foLFHf'ir u ; l' glbM u i jek kqdkkkq}kjk vakr%foLFHf'ir dju dsQyLo: i cus yo. k dks vEylr yo. k dgrsgA*

vFlok

os yo. k t k fdl h Hle }kjk fdl h vEj ds viwlzmnl hulclj. k dsQyLo: i cursgA ml svEylr yo. k dgrsgA bl eafLFHf'ir u ; l' glbM u glrk gA tS NaHSO₄, KHSO₄, br' kn A

- (iii) *Hlelr yo. k (Basic Salt) & osHle ft u ds v. k ea, d l svfekl OH l eg glrk gA vEylr }kjk vl'xd : i l smnl hu glclj Hf'led yo. k cukrk gA tS s&Pb(OH)NO₃. bl eafLFHf'ir u ; l' glbM kM ewd glrk gA*

izu 17- pH ds vleljij ij yo. k adk oxhclj. k djA

mUlj & vEj vl' Hle dhiNfr ; k pH vleljir yo. k ds foy; u rlu rjg ds glrk gA&%

- (i) *mnl hu yo. k foy; u (Natural Salt Solution) & izy vEj , oaizy Hle ds yo. k foy; u mnl hu glrk gA buclpH eku 7 glrk gA ; s*

fyVel dkjæ ifjorŹi ughdjra tŹs NaCl, KCl, NaNO₃, Na₂SO₄ br kŹn A

(ii) **vEylŹ yo. kfo; yu (Acidic Salt Solution)** - izy vEylŹ, oanqŹ Hle dsyo. kfo; u vEylŹ ghrsgŹ bl dkpH eku 7 l sde ghrk gŹ ; s fyVel dkyhy jæ ulykeai fjoŹrŹ djrs gŹ tŹs NH₄Cl, (NH₄)₂SO₄ A

(iii) **HleŹ yo. kfo; u (Basic Salt Solution)** - izy Hle, oanqŹ vEylŹ dsyo. kfo; u {kjlŹ ghrsgŹ budk pH eku 7 l s vfekd ghrk gŹ tŹs- Na₂CO₃, K₃PO₄ br kŹn A

izu 18- yo. k ds l kŹŹ xqkæ dks fy/ kŹ mŹkŹ & yo. k ds xqk fuEufyf/ kŹ gŹ%

(i) izy vEylŹ rFlk izy Hle l scusyo. kæ dkt yŹŹ foy; u mnkl hu ghrk gŹ rFlk foy; u dkpH eku 7 ghrk gŹ tŹs KCl, NaCl, KNO₃ br kŹn A

(ii) izy vEylŹ rFlk nqŹŹ Hle l scusyo. kæ dkt yŹŹ foy; u vEylŹ ghrk gŹ tŹs- NH₄Cl, FeCl₃, FeSO₄ br kŹn A

(iii) nqŹŹ vEylŹ rFlk izy Hle l scusyo. kæ dkt yŹŹ foy; u {kjlŹ ghrk gŹ rFlk foy; u dkpH eku 7 l s vfekd ghrk gŹ tŹs- Na₂CO₃, NaHCO₃, CH₃COONa br kŹn A

izu 19- pH l dy D; k gŹŹ (SPL)

mŹkŹ & 1909 bŹ eal kŹŹ u usH⁺ vk; u dh l kærk dks Q Dr djus dŹŹŹ, pH fpæ dkm i; læ fd; kæ bl eal l s 14 rd dh l æ; k j ghrsgŹ bl spH l dy dgk t krk gŹ



izu 20- pH eku D; k gŹŹ

mŹkŹ & xte v. kŹiŹŹ yŹŹŹ eal Dr gŹb Mkt u vk; ula dŹŹ l kærk dŹŹŹ. kŹed y? læqkd dkpH eku dgk t krk gŹ

$$\text{pH} = -\log [\text{H}^+] = \log \left[\frac{1}{\text{H}^+} \right]$$

'kŹ t y dkpH eku 7 ghrk gŹ

izu 21- pH eku dk D; k egŹb gŹŹ

mŹkŹ & gekŹs nŹud t hu eal pH vr; ŹŹ egŹb i vkŹŹŹŹŹ j/krk gŹ bl ds egŹb

fuEufyf[kr g&%

- (i) *ty dkpH eku Kkr djdsirk yxk; k t krk gSfd ty fdl dk; Zds fy, mi; Ør gA*
- (ii) *jDr dkpH eku Kkr djdsirk yxk; k t krk gSfd jDr 'k' gS; k v'k A*
- (iii) *feVWh dkpH eku Kkr djdsirk yxk; k t krk gSfd bl eadk&l h Ql y mxk; h t k l drh gA*
- (iv) *vud j l k fud vffHØ; k apH }kjk fu; f-r dh t krh gA t S & ty vi?Wu vffHØ; k fd.ou br; knA*
- (v) *ikpu ræ dspH dkirk yxkdj jksædh t kudkjh iDr dh t krh gA (1.0)*
- (vi) *nkrædspH eku eafjorZi ghusij nkr u"V ghus yxrs gA (5.5)*
- (vii) *ty dkpH , d fuf'pr l lek dsvæj jgusij jgusokyst ylr t ho t hfor jgrs gA*

izu 22- mnkl hukdj. k vffHØ; k l svki D; k l e>rs gA\ mnlgj. k }kjk l e>loa mûkj & vEy rFlk {kjd dsvffHØ; k dsQyLo: i yo. krFlk ty curk gA ml s mnkl hukdj. k vffHØ; k dgrs gA



izu 23- usY i k&s\ cwY dh D; k fo'k&rk gS

mûkj & usY, d'k/ktr i k&kgSt kst xylæami t rk gA bl dsifuk; læaMduqk chy gkrsgA vxj xyrh l sNufy; k t k rksMal t S k nnZgkrk gA bu chylææeFlækd vEy dk l ho ghus dsdkj. k nnZgkrk gA Mal ekjus ds LFku ij M&W i k&s dh i Ukh jxMusij bykt gk t krk gA ; si k&s vfekdry usY dsikl ik stkrsgA M&W i k&s l sdN HLe ; k {kjk fudyrsgA t k vEy ds iZho dks mnkl hu dj nrs gA

izu 24- vPNs Ql y dsfy, feVWh dkpH eku 5.5 – 7.0 g&rk pl&g, A fdl ku feVWh eap&k D; k f&ykrk gS

mûkj & feVWh dkpH eku 5.5 – 7.0 dschp jgusij Ql y vPNsgkrsgA feVWh ds vR; f&kd vEylr ; k {kjk ghusij i k&s dh of) ck&kr gk t krh gA feVWh dsvf&kd vEylr ghusij ml eadyh p&k Hk/kjk p&k ; k dSY'k; e dk&Z&V M&ydj ml dkpH fu; f-r fd; k t krk gA bu jkl k fud ink&æ ds H&fLed ghus dsdkj. k ; s feVWh dsvrfjDr vEylr rk dks de dj nrs

gā vr%fdl lu puk feykrk gā

izu 25- {kkjkdsegrbiwZjkl k fud xqk dksfy/ka

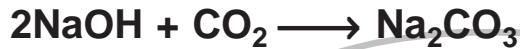
mūkj & {kkjkdsegrbiwZjkl k fud xqk fuēufyf/kr g&%

(i) *ēkrqhal sfθ; k* & {kkj dN *ēkrqhal sfθ; k* dj H₂ x\$ mRi lu djrsgā



1/4 kM; e ft ad 1/2

(ii) *ok q1 sfθ; k* & dN {kkj *ok qeami fLFkr CO₂ 1 sfθ; k* djrsgā



(iii) *vEykhal sfθ; k* & {kkj *vEykhal sfθ; k* dj dsyo. k r\$ kj djrsgā



(iv) *yo. hal sfθ; k* & rkch ylgj ft ad vkn dsyo. k {kkjhal sfθ; k djrsgā
g\$ v\$ v?kyu 'khy ēkRd glbM kM r\$ kj djrsgā



izu 26- *gekjsnūd t hou eavEyk d splj mi; lx crka*

mūkj & *gekjsnūd t hou eavEyk d splj mi; lx fuēufyf/kr g&%*

(i) fl jdk *gekjsnūd* u dks i dks v\$ ml dh l g {kk rFk vlpkj cukusea
dke vkrk gā

(ii) *gekjsiV e HCl* gkudkj d t lok k yladksu"V dj nrk gā t k Hkt u
ds l kFk igp t k rsgā

(iii) *Vj V\$jd vEyk c\$da ikmMj* cukusea dke vkrk gā

(iv) *dkūd vEyk is inkFk e a iz qR* glrk gā

izu 27- *vEyk dh gekjst hou ead; k gkfu; k gā*

mūkj & *vEykhal sgkukyh gkfu; k fuēufyf/kr g&%*

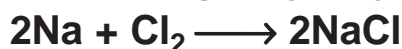
(i) ; s l t h d k " k d k v l a d k s u " V d j r s g ā

(ii) l k a z v E y R o p k v \$ d k e y v a l a d k s x a l l j { k r i g p k r s g ā

(iii) d N [k k / i n k F k d k [k j k d j n r s g ā

izu 28- 1 kM; e Dykj kM 1/4 kēkj. k ued 1/2 d\$ scuk kt krk g\$ bl dsnkseq;
jl k fud xqk rFk mi; lx crka

mūkj & xeZl kM; e ij Dykj hu x\$ inkgr djusi j 1 kM; e Dykj kM curk gā



jkl k fud xqk&%

(i) ; g , d vk fud ; kxd g\$ t k vfr ?kyu 'khy gā

(ii) ;g , d 'or jolkj inkfzga

mi; lx &%

(i) Hkt u cukesa

(ii) gkbMt u DykjbM(HCl), cfdax i kmMj/ l kM; e clbZlkclzV/ l kM; e gkbMM lbM vkfn dsfuekzk ea

izu 29- l kkkj. k ued dh i hr dgk&dgk gkrh gs\ Li "V dja

mkkj & l kkkj. k ued fuFufyf/kr l hr l si hr gkrk g&%

(i) l egh ty&l emzds [kkjsty dks cM&cM xM-k ea, d= dj l wZds izlk'keak'ir gksnrga ok'u dsch Bk ued dsjos i hr gkrsga

(ii) [kut ued ~~1/2~~ kuka; k pVvuka l s&vklVty; k ea ued [kuka l s fudkyk tkrkga bl dsfy, t ehu ds vanj, d i Ei ?k krgs ft l ea rhu l alkh ukfy; k gkrh ga clgj okyh uyhl sxeZty vanj i osk dj k tkrkgs ft l l sued dkfoy; u r\$ kj gkrkga l cl svanj okyh uyhl sgklj mPp nkc ij gok dk > l k vanj Hk k tkrkga ued ds foy; u dks clp okyh uyhl sgklj clgj fudky nrga foy; u dks Nkudj ok'ir djusij ued i hr gkrk ga

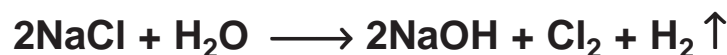
(iii) >ly l s& jkt LFku dh l kkkj >ly/ vesj dk dh xV l kV ysd/ : l dh ysd, YWu l s Hh ued r\$ kj gkrk ga bl sty dsok' i hdj. k l s i hr fd; k tkrk ga

izu 30- l kkkj. k ued gok eaD; l i l lt us yxrk gs\

mkkj & l kkkj. k ued ea v' k ds: i ea xulf' k e DykjbM jgrk ga MgCl₂, d i zosh inkfzgst ksuehl k kkrk ga bl h dkj. k l kkkj. k ued [kyh gok ea j/ kusij i l lt us yxrk ga

izu 31- l kM; e gkbMM lbM(NaOH) d s scuk k tkrk gs\ bl ds mi; lx crk mkkj & l kM; e gkbMM lbM dks Dyk j, Ydyh fofek } kj k cuk k tkrk ga bl s dkLVd l kM Hh dgrsga bl sfo/ q vi? kVu fofek } kj k cuk k tkrk ga

l kM; e DykjbM dst yhr foy; u eafo/ q ekjk i zkgr djusij ; g vi? kVr gklj l kM; e gkbMM lbM Dyk jhu rFk gkbMt u cukrk ga



mi; lx &%

(i) ekkrq l ds xzt gVkusea

(ii) l kq/ viakt Zl rFk dkxt dsfuekzk ea

(iii) Nf=e Qlbcj/ Nf=e oL=/ js'k vkfn dsfuekzk ea

izu 32- I kM; e ckbZlkckZV ; k [kuskdk I kM dS scuk; k t krk gS\ bl dsnks eq; jkl k; fud xqk rFlk mi; lx crk

mUkj & I kM; e ckbZlkckZV dks vekU; k I kM fofek; k I kYos fofek } kjk cuk; k t krk gA

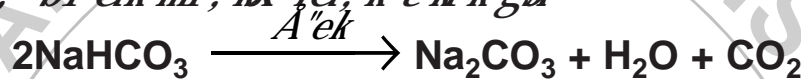
I kM; e dkckZV dst yH ?kY eaCO₂ xS izkfgr djusij I kM; e ckbZlkckZV dk vo{ki iHr gkrk gA



jkl k; fud xqk &%

(i) ;g, d joknkj I Qn Bkl inktZgA

(ii) [kuk idkrsle; tc; g xeZgkrk gS rks; g I kM; e dkckZV] ty rFlk dkckZ MbZ kM kM xS nsk gA vr% [kuk dks 'k?krk l sipkhs dsfy, bl dk mi; lx fd; k t krk gA



mi; lx &%

(i) bl dk mi; lx vfxu'ked ds: i eagkrk gA

(ii) bl dk mi; lx cfdax ikmMj ds fuelZk eaf; k t krk gA

izu 33- I kM; e dkckZV kuskdk I kM dS scuk; k t krk gS\ bl dsnks eq; jkl k; fud xqk rFlk mi; lx crk

mUkj & bl dk jkl k; fud uke I kM; e dkckZV Mdk glbM gA ft I dk I # Na₂CO₃ . 10H₂O gkrk gA

cfdax I kM dks xje djusij I kM; e dkckZV curk gA



iHr I kM; e dkckZV dst y lsfOLVyHr djus l sekkou I kM iHr gkrk gA



jkl k; fud xqk &%

(i) ;g I Qn ikjn'kZ joknkj inktZgkrk gA

(ii) bl dks xje djusij ;g 10 v. kjok ty ds [knsrk gA vlf fut ZH Na₂CO₃ cukrk gA



fut ZH Na₂CO₃ dks I kM {kY ; k I kM jk/k dgrs gA

mi; lxx%

(i) bl dk mi; lxx [kjk ty dks enq cukuse agkrk gā

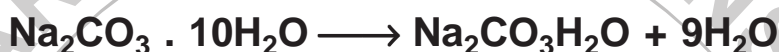
(ii) ol' lxx l kM ds: i eā

(iii) dkxt m/lxx eā

(iv) dlp m/lxx eā

izu 34- mRQyu fdls dgrsgā mRQyu inf'kz djustokys, d; lxxd dk uke fy/lxx, d vfhfθ; k nslj l e>loā

mūj&ok qea [kyk NkM nsisij l kM; e dkclzV jok ty [kclj l Qn iwZea cny tkrk gā bl ds 10 v. lgeal s9 v. kpfudky dj ok; qaly eapyst krs gā l Qn vijñ 'kz i kmMj cp tkrk gā ft l sl kM; e dkclzV ekulglbM dgrsgā bl fθ; k dks mRQyu dgrsgā



mRQyu inf'kz djustokys; lxxd l kM; e dkclzV glrk gā

izu 35- vfxu'kled; & }kjk vlx cqlusdh fθ; k dks jkl k fud vfhfθ; k }kjk l e>loā

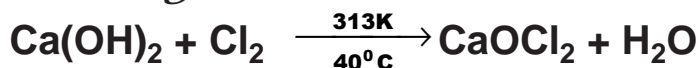
mūj&l kM; e clbZlclzV dk mi; lxx vfxu'kled; & lxx ea Hh fd; k tkrk gā vfxu'kled; & ea NaHCO₃; k H₂SO₄ jgrsgā vlx yxusij bl; & dh ?lqMhij nlc Myk tkrk gā ft l l sNaHCO₃ rFlk H₂SO₄ ijLij l Eī dZea vldj CO₂ xš cukrgā; g xš rt hl sclgj fudydj vlx dks cqlusdh gā



izu 35- fojā d pwlZdš cuk; k tkrk gā bl dsnksed; jkl k fud xqk rFlk mi; lxx crloā

mūj&bl dk jkl k fud uke dšY'; e vllM lDylylbM glrk gā bl dk l # CaOCl₂ glrk gā bl s cylvax i kmMj; k pws dk DylylbM Hh dgrsgā

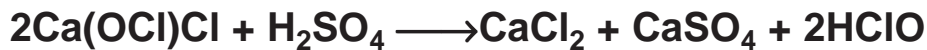
Bkl 'kjd cqlusij 313 K; k 40°C ij Dylylu xš i nlfgr djust ij fojā d pwlZcurk gā



jkl k fud xqk &%

(i); g l Qn pwlZgš ft l ea Dylylu tš h xak glrh gā

(ii); g ruq H₂SO₄ dh vYi ek=k dsl kfk vfhfθ; k dj dšY'k; e l YQV/ glbM Dylyjd vEY rFlk vllM lt u nsk gā



bl izdkj i hr vkm lt u uot kr vkm lt u gkrk gSA vr%bl dk mi; lx fojt d ds: i eafd; k t krk gA

mi; lx &%

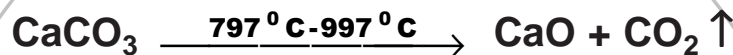
(i) bl dk mi; lx ty dls 'lj djuseadlvk kpk'kd ds: i eafd; k t krk gA

(ii) dkxt rFlk di Mk m/lx eafot d ds: i ead

izu 36- dyh&pwk d's cuk; k t krk gSA bl ds nks eq; jkl k fud xqk rFlk mi Hlx crloA

mLkj&bl dk jkl k fud ule dSY'k e vkm lbM(CaO) gA

t c pwki Rfj dks 1000°C l sde rki ij, d HVBheaxje fd; k t krk gS rkpwk i Rfj Vwdj dyh&pwk rFlk CO₂ cukrk gA



jkl k fud xqk &%

(i) ;g l Qn cjoknj inkFZgA bl dk no. kad 2597°C gkrk gA

(ii) ;g ty l si frfO; kdj dSY'k e glbM lbMrFlk A"ekefr djrk gA



bl scqk pwk Hh dgrsgA bl i fO; k dls Hjdruk ; k i hr pws dls Hjdhpwk dgk t krk gA

jkl k fud xqk &%

(i) l heV m/lx ead

(ii) Gylfpx i kmMj cukusead

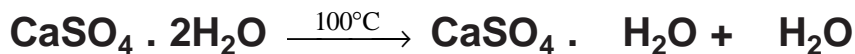
(iii) dkp dsmRknu ead

izu 37- IyKLVj vkm isjl d's cuk; k t krk gSA bl ds nks eq; jkl k fud xqk rFlk mi; lx crloA

mLkj&bl dk jkl k fud ule dSY'k e l YQV velg lbM gA ft l dkl # CaSO₄ . $\frac{1}{2}$ H₂O gkrk gA

bl svelz y; ktr dSY'k e l YQV dgrsgA bl sl shi e P.O.P dgk t krk gA

ft l e dks bLkr dscjru e 100°C rki ij xje djusij ;g ty ds v. lyk dkr lx dj IyKLVj vkm isjl curk gA



jdk k fud xqk &%

(i) ;g , d l Qn pwlZgA

(ii) ty dsl kfk feydj ;g dMk rFk fNnz qR cu t lrk gA
mi; kx&%

(i) 'kV; fpfdRl k eaHh gfMAM; la dls t kMused

(ii) efrZ kadk l lpk cukused

(iii) vfxujlekd inkFIZcukused

izu 38- fuEu ds djk. k crkx&

(i) ihry rFk rkcs ds cjru ea ngh rFk [kVs inkFIZD; la ughaj/kuk
pkfg; |

mUj& ngh rFk [kVs inkFIZ ea vEy gkrk gA vEy ekrqvlal svfHfO; k dj yo. k
rFkH₂ xS cukrsgA ft l l sinkFIZ/kus; kV; ughajgrk gA l kfk gh ngh
, oa [kVs inkFIZ dks rkcs ds cjru la eaj/lk tk xk rks vEy dh fO; k ds
djk. k cjru l qkfjr gk tk xkA

(ii) vEy dk tyh foy; u fo/q³ dk pkyu D; la djrk gS

mUj& vEy ty ea?kydj eku , oa_ . k dk fuelZk djrk gS



(iii) 'kjd gkbMdykfjd xS fyVel i= dk jax D; la ughacnyrh gS

mUj& 'kjd gkbMdykfjd xS eagkbMt u vk u (H⁺) ughajgrk gA bl fy, ;g
vEyh vfhky{k k i zn' kZ ugha djrk gA ft l ds djk. k fyVel i= ds jax
dks ughacnyrh gA

(iv) vkl for ty ea fo/q³ dk pkyu D; la ughagrkc fyD o'WZt y eagkrk gS

mUj& vkl for ty ea dkbZ vk fud ; lfxd foyS ughagrA ft l ds djk. k ;s
vk ulaeafO?kVr ughagrsgA o'WZt y ok qaly l sgkrsgg Hfe ij fxjrs
l e; ok q ds vEyh xS a CO₂, SO₂, NO₂ br, kn dks ?kyk nrk gA
ft l l sfofHfu izdkj ds vEy Oe 'k%dkZud vEy (H₂CO₃), l yD; jil vEy
(H₂SO₃), ulbVl vEy (HNO₂) ; kulbfVl vEy (HNO₃) cukrsgA ; svEy
vk ulaeafO?kVr gkrsgA bl fy, o'WZt y fo/q³ dk pkyu djrsgA

(v) *ty dh vuqfLFkr eavEY dk Q ogkj vEYh D; lauglagkrk |*

*mUkj&vEY dOY ty dhmiFLFkr eagbMAt u vk; u mRi lU djrsgA gkbMAt u
vk; u dhmiFLFkr dsdkj. k vEYh dk Q ogkj vEYh glrk gA vr%ty
dh vuqfLFkr eagbMAt u vk; u ughacura bl dkj. k vEY viuk vEYh
Q ogkj ughadjrkA*

*izu 43- rkt snik dspH eku 6 glrk gA ngh cu t kusij bl dspH eku ead; k
ifjorZi glxk |*

*mUkj&ngheaySDVd vEY glrk gA vFLZ~tc nuk l sngh cu t krk gSrk og
vfekd vEYh gkst krk gA bl fy, nrk pH dk eku 6 l sde gkst k xkA*

izu 44 , d Xokyk rkt snik eafkMk csda l kMk feykrk gA

(a) *rkt knik dspH eku dks 6 l scny dj fksMk {kkjh D; kacuk nrk gS |*

(b) *bl nuk dks ngh cuuseavfekd l e; D; la yxrk gS |*

*mUkj&(a) nuk eacsdax l kMk feyk dj {kkjh cukfn; k t krk gA rkfd nuk vfekd
l e; rd jg l dA vFLZ~nuk QVsugha nuk QVus dk rkA; ZgSnuk
dk [KVvk gkst kuka*

(b), *d snik eangh cuuseavfekd l e; bl fy, yxrk gSfd {kkjh nuk igys
mnkl hu glrk gSrk ngh curk gA vr%nuk dsySDVd vEY dks igys
ml eamiFLFkr {kkj dks mnkl hu djuk glrk gSrk ngh curk gA*

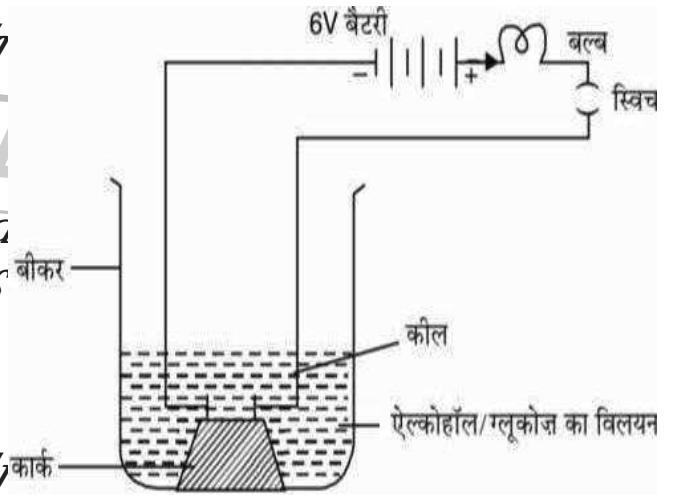
*izu 45- vki dks rhu ij/kufy; k nhxbZgA bl eal s, d eavkl for ty, oa'kk
nkeal s, d eavEYh foy; u rFkknjse {kkjh foy; u gA ; fn vki dks
dOY yky fyVel i= fn; k t krk gSrk vki iZ sd ij/kuyheaj/kx; s
inkFLZdh igpku dS s djxs |*

*mUkj&yky fyVel i= dks ckjh&ckjh l s rhuk ij/kufy; la eamYrs gA t k
foy; u yky fyVel i= dks ulyk dj nrk gA og {kkjh foy; u gA
vc ulykgg fyVel i= dks ckjh&ckjh l s'kknksij/kufy; la eamYrs gA
t k foy; u ulyk fyVel i= dks yky dj nrk gA og vEYh foy; u gA
'kk cpk foy; u vkl for ty gA bl eayky , oaulhs fyVel i= ij
dkbZiZko ugha iMrk gA*

izu 46- , YdkgW , oaXyvkkt tSs; kfxdlæeaHh glbMkt u gkrs gñ ysfdu budkoxlñZj. kvEý dhrjg ughagrk gñ , d fØ; kdyki } kjkbl sl kcr dñ

mñkj&, YdkgY , oaXyvkkt ty ea?kyusij glbMkt u vk ula(H⁺) ds: i ea vFlkZ~; s vk ula ea fo?kVr ughagrk gñ bl fy, buds?kky fo/q dk pkyu ughadjrsgñ

bl sl kcr djus ds fy, fp=kud ky midj. kñ dks l tk k t krk gñ chdj ea vYdkgY dk?kky yrs gñ bl ea fo/q èkjk i ñkgr dh t krh gñ ge i krs gñ cYc ughat yrk gñ bl l sfl) gkrk gñ fd , YdkgY dk?kky fo/q dk pkyu ughadjrk gñ



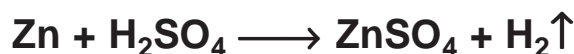
Page No. 20, Fig. 2.2

ge chdj eaXyvkkt dk?kky yslj iz kx dks ngjkrsgñ cYc fQj Hh ugha t yrk gñ bl l sfl) gkrk gñ Sfd Xyvkkt dk?kky Hh fo/q dk pkyu ughadjrk gñ vr%, YdkgY rFlk Xyvkkt tSs ; kfxdlæea glbMkt u gkrs gñ Hh budkoxlñZj. k vEý dh rjg ughagrk gñ

izu 47- D; k gkrk gñ t c&%

- (i) ruql Yñ; fjd vEý dh vFlkØ; k t Lrk l sgkrh gñ
- (ii) rugglbMdykfjd vEý dh vFlkØ; k exulf'k e l sgkrh gñ
- (iii) ruql Yñ; fjd vEý dh vFlkØ; k , Y; fefu; e l sgkrh gñ
- (iv) rugglbMdykfjd vEý dh vFlkØ; k ylgk l sgkrh gñ
- (v) ruql Yñ; fjd vEý ea Bkl l kM; e dñkñV feykrsgñ
- (vi) ruql Yñ; fjd vEý/ñkñkj ft al ds l kñk vFlkØ; k djrk gñ

mñkj&(i) ruql Yñ; fjd vEý dh vFlkØ; k t Lrk l s dj k h t krh gñ rks ft al l YQV rFlk glbMkt u xS curk gñ



- (ii) rugglbMdykfjd vEý dh vFlkØ; k t c exulf'k e l s dj k h t krh gñ rks exulf'k e DykjbM rFlk glbMkt u xS curk gñ



(iii) ruql Y%; fjd vEy dh vfhfO; k, Y; fefu; e lsdjk h t krh gSrk
, Y; fefu; e l YQV rFfk glbMt u xS curk gA



(iv) rugglbMtYk fjd vEy dh vfhfO; k ykgl lsdjk h t krh gSrk Qj l
DyglbMt curk gS rFfk glbMt u xS eQr glrh gA



(v) ruql Y%; fjd vEy eal kM; e dkclzV feykrsgarks l kM; e l YQV
curk gS rFfk H₂O, oacO₂ curs gA



fofHlu foy; uladk pH eku

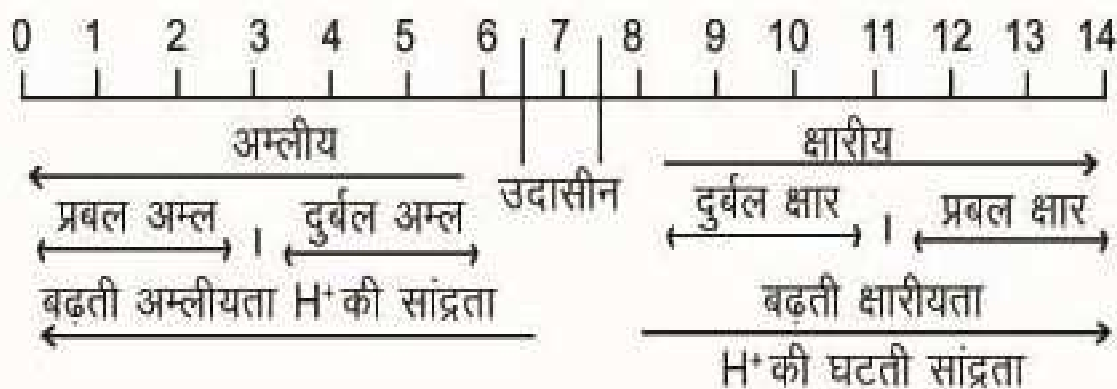
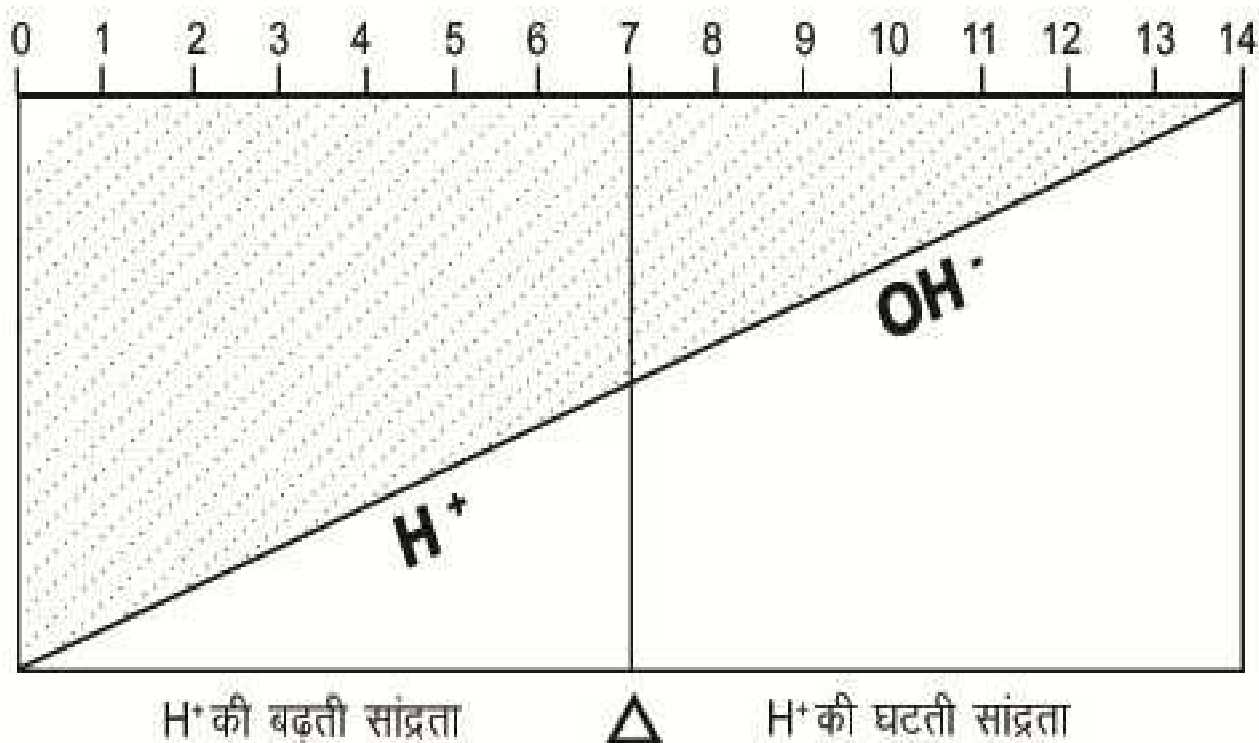
fofHlu inkfHk eami lFkr vEy

foy; u	—	pH eku
vek'k j l	—	1
ulhwjl	—	2.5
fl jdk	—	3.0
VekVj j l	—	4.1
i l huk	—	4.5
vEy o"lWZ	—	5.6
is'kk	—	6
nrk	—	6.5
'kq ty	—	7
vk l w	—	7.3
[kr	—	7.4
fi lk	—	7.5–7.8
pwk ty	—	11.0
ykj ¼kks ds igy½	—	8
ykj ¼kks ds ch½	—	6
ulhwjl	—	2
jæ jfgr is	—	10
xkt j dk j l	—	6
dkQh	—	5
VekVj dk j l	—	4
uy dk ty	—	8
1 M NaOH	—	14
1 M HCl	—	0
ekuo 'kij	—	7.0 / 57.8
feYd vkQ eXus'k k	—	10.5
[Mg(OH) ₂]		

iNfrd l kr	—	vEy
fl jdk	—	, l hVd vEy
l ajk	—	l kbVl vEy
beyh	—	VkVjd vEy
VekVj	—	vkVt Syd vEy
[kVvk nrk ¼gh½	—	ySDVd vEy
ulhw	—	l kbVl vEy
plVh ¼sy½dk Md	—	eSkubd ¼QWZ½vEy
l x	—	ekfyd vEy
ve: n	—	vkVt Syd vEy
eD[ku	—	C; Qlfjd vEy
pk	—	Vsud vEy
ol k	—	LVh fjd vEy
e/lQD/kh dk Md	—	eSkubd vEy
I; kt	—	, l dWZ vEy

izu 47- dkčud vĕy vĕg vdkčud vĕy ea varj Li "V dja
mĕj&dkčud vĕy vĕg vdkčud vĕy eafuĕfyf[kr varj g&%

S.No.	dkčud vĕy	vdkčud vĕy
1.	fl fVĕl vĕy&bl vĕy dkmi; lŕ [kk/ inkFkŕdsifjj{k k vĕg Lokfn"Brk dsfy, gkrk gŕ	xakd dk vĕy; k l Yŕ; fjd vĕy&bl vĕy dk mi; lŕ cŕjŕj j l k fud [kkn/ iŕ] fMjt ŕ] gkbMŕdykŕjd vĕy vĕfn dsfuekŕkeami; lŕhgŕ
2.	, fl fVd vĕy&fl jdk ds: i ea vplj dŕ [kVŕk cukus ds dke ea vkrk gŕ	gkbMŕdykŕjd vĕy&ckFk e l kŕ djuŕ PVC ds mŕi knu eaç; ŕr gkrk gŕ
3.	Vkŕŕjd vĕy&cŕda i kmŕj cukuseaç; ŕr gkrk gŕ	ukbŕVĕl vĕy&bl vĕy dk vi; lŕ TNT/ Mŕ ukelbV vĕfn foLŕkŕd ds mŕi knu ea gkrk gŕ



jā ifjolkā

S.No.		vEyl	vEyl
I.	fyVel	yky	ulyk
II.	esFky vlyt	yky	ilyk
III.	fQulWi Fkyhu	jāghu	xykch
IV.	gYnh	ilyk	yky&Hjik
V.	pqlthj	yky&c&uh	ilyk
VI.	yky xkth dk irk	yky&c&uh	gjk

1- vly QDVjh l pd D; k gš mudsule fy/ka
 mlj&cl, l sinkfzghrga ft udhxak vEyl rFlk {kjl; el; e esfHu&fHu
 gkrhga mlgavly QDVjh l pd dgrga t \$ &l; kt / yoax dkry / ofuykb=A
 jl k fud l #

- (I) l xejej & CaCO_3
- (II) l k k ok'k & Na_2CO_3
- (III) okl x l k k & $\text{Na}_2\text{CO}_3 \cdot 10 \text{H}_2\text{O}$
- (IV) fojt d pwz & CaOCl_2
- (V) ulyk FlkFlk 1/4; k/2 & $\text{CuSO}_4\text{CO}_3 \cdot 5\text{H}_2\text{O}$
- (VI) csda l k k & NaHCO_3
- (VII) IyLVj vly isjl & $(\text{CaSO}_4)_2 \cdot \text{H}_2\text{O} ; k \text{CaSO}_4 \cdot \frac{1}{2} \text{H}_2\text{O}$
- (VIII) dkLVd i k k & KOH
- (IX) l k k & CaNO_3
- (X) ykQax xs & N_2O
- (XI) uk k nj & Na_4Cl
- (XII) yky fl thj & Pb_3O_4
- (XIII) ySDVd vEyl & $\text{C}_3\text{H}_6\text{O}_3$
- (XIV) VLVjd vEyl & $\text{C}_4\text{H}_6\text{O}_6$
- (XV) QkVZl vEyl 1/2 & CH_{42}O_2

(XVI)	<i>vkkt Syd vEy</i>	&	$C_2H_2O_4$
(XVII)	<i>QkQkjd vEy</i>	&	H_3PO_4
(XVIII)	<i>dkcud vEy</i>	&	H_2CO_3
(XIX)	<i>, LdkcZl vEy</i>	&	$C_6H_8O_6$
(XX)	<i>; fjd vEy</i>	&	$C_5H_4N_4O_3$

<i>ja</i>	PH	<i>eku</i>	
(I) <i>xkk yhy</i> (Dark Red)	0	}	<i>vEyL</i>
(II) <i>yhy</i> (Red)	1		
(III) <i>xgjk yhy</i> (Dark Red)	2		
(IV) <i>uljah yhy</i> (Orange Red)	4		
(V) <i>uljah ihyk</i> (Orange Yellow)	5		
(VII) <i>gfjr ihyk</i> (Greenish Yellow)	6		
(VIII) <i>gjk</i> (Green)	7	}	<i>mnl hu</i>
(IX) <i>gfjr ulhyk</i> (Greenish Blue)	8	}	<i>{kjl</i>
(X) <i>ulhyk</i> (Blue)	9		
(XI) <i>gfjr ihyk</i> (Navy Blue)	10		
(XII) <i>t leqh</i> (Purple)	11		
(XIII) <i>xkk t leqh</i> (Dark Purple)	12		
(XIV) <i>cauh</i> (Violet)	13-14		
