CHEMISTRY

CLASS – X

CHAPTER – 2

vEy] {kkjd ,oa yo.k

ACID, BASE & SALT

iz'u 1- vEy fdls dgrs gSa

mÙkj& vEy og inkFkZ gS ftldk Lokn [kVVk gksrk gSA tks uhys fyVel dks ?kksy dk yky dj nsrk gSA tyh; foy;u esa gkbMªkstu vk;u (H^+) esDr djrk gS rFkk èkkrq ij vEy dh vfHkfØ;k ls gkbMªkstu xSl esDr gksrh gSA

tSls&**HCl, HNO_3, H_2SO_4** bR;kfn A

iz'u 2- {kkjd ;k HkLe fdls dgrs gSa

mÙkj& {kkjd og inkFkZ gS ftldk Lokn dMok gksrk gS] yky fyVel dk uhyk cukrk gSA bldk tyh; foy;u (OH^-) gkbMªkstu vk;u esDr djrk gSA rFkk vEy ls vfHkfØ;k dj yo.k cukrk gSA

tSls&**NaOH, CuO, CaO** rFkk **$Ca(OH)_2$** bR;kfnA

iz'u 3- yo.k dh ifjHkk"kk mnkgj.k }kjk nsA

mÙkj& o inkFkZ yo.k dgykrk gS tks fyVel i=k dks ifr mnklhu gksrk gSA èkkrq rFkk vEyksa ds chp vfHkfØ;k ds QyLo:i yo.k curk gSA

$$Zn + 2HCl \longrightarrow ZnCl_2 + H_2\uparrow$$

iz'u 4- vEy ds ikp xq.kksa dks fy[kAs

mÙkj& vEy ds ikp xq.k fuEufyf[kr gSa&

(i) vEy Lokn esa [kVVs gksrs gSA tSls&uhcw] lsjkA

(ii) ds N vEy fo"kSys gksrs gSA tSls&dkcksfyd vEy ¼fQuksy½

(iii) ds N vEy lsfkZd ,oa gkfudkjd gksrs gSA tSls&lY¶;fjd vEyA

(iv) ds N vEyksa ls vuqd iqdkj ds [kkn ,oa foLQksVd cuk;s tkrs gSA tSls &ukbfVªd vEyA

(v) ds N vEy LokLF; ij cjk iHkko Mkyrs gSA

iz'u 5- {kkj dk ikp x.kksa dk fy[kA

mÙkj& *{kkj dk x.k fuEufyf[kr gSa&%*

(i) *budk Lokn dMok gksrk gSA*

(ii) *;s lkcqu tSls fpduh gksrh gS rFkk Ropk dks gkfu igqapkrh gSA*

(iii) *;s yky fyVel dk uhyk dj nsrh gSA*

(iv) *;s gYnh ds jax dk Hkjk yky dj nsrh gSA*

(v) *;s vEyksa ds lkFk fØ;k djds yo.k rFkk ty cukrh gSA*

iz'u 6- {kkjksa ds mi;ksx crkvksA

mÙkj & *{kkjksa ds mi;ksx fuEufyf[kr gSa&%*

(i) *bldk mi;ksx lkcqu cukus esa fd;k tkrk gSA*

(ii) *bUgsa {kkjh; cVfj;ksa esa i;qDr fd;k tkrk gSA*

(iii) *budk mi;ksx ikVksy fjQkbfuax vkSj dkxt m|ksx esa i;qDr gksrk gSA*

(iv) *dBksj ty dks eqn cukus esa bldk mi;ksx fd;k tkrk gSA*

iz'u 7- vEy rFkk {kkj esa vUrj Li"V djsaA

mÙkj & *vEy rFkk {kkj esa fuEufyf[kr vUrj gSa&%*

vEy	*{kkj*
(i) *bldk Lokn [kVVk gksrk gSA*	**(i)** *bldk Lokn dMok gksrk gSA*
(ii) *;g uhyk fyVel i= dks yky dj nsrk gSA*	**(ii)** *;g yky fyVel i= dks uhyk dj nsrk gSA*
(iii) *;g ty esa foy; gksdj gkbMªkstu vk;u* **(H^+)** *nsrk gSA*	**(iii)** *;g ty esa foy; gksdj gkbMkbM dk;u* **(OH^-)** *nsrk gSA*
(iv) *;g {kkjd dk mnklhu dj nsrk gSA*	**(iv)** *;g vEy dk mnklhu dj nsrk gSA*
(v) *bldk* **pH** *eku 7 ls de gksrk gSA*	**(v)** *bldk* **pH** *eku 7 ls vf/kd gksrk gSA*

iz'u 8- vkjgfuy }kjk nh xbZ vEy rFkk HkLe dh ifjHkk"kk nsaA

mÙkj &vEy &vEy og inkFkZ gS tks ty esa ?kqydj gkbMªkstu vk;u **(H^+)** *inku djrk gSA*

*tSls &***HCl, H_2SO_4, HNO_3, CH_3COOH** *bR;kfnA*

$$HCl \xrightarrow{H_2O} H^+ + Cl^-$$

HkLe &HkLe og inkFkZ gS tks ty esa ?kqydj gkbMªkDlkbM **(OH^-)** *vk;u nsrk gSA*

tSls & **NaOH, KOH, NH_4OH, $Ca(OH)_2$** *bR;kfnA*

$$NaOH \xrightarrow{H_2O} Na^+ + OH^-$$

iz'u 9- vk;uhdj.k dh vkèkkj ij vEyksa dk foHkktu fdu oxksa esa fd;k tkrk gS\ o.kZu djsaA

mÙkj & vk;uhdj.k dh vkèkkj ij vEyksa dk foHkktu nks oxksa esa fd;k tkrk gS&

(i) izcy vEy (Strong Acid) – tks vEy ty esa ?kqydj yxHkx iw.kZr% vk;fur gksdj gkbMªkstu vk;u (H^+) iznku djrs gSaA tSls & gkbMªkDyksfjd vEy (HCl), ukbfVªd vEy (HNO_3), lYQ;qfjd vEy (H_2SO_4) bR;kfnA

(ii) nqcZy vEy (Weak Acid) – o vEy tks ty esa ?kqydj flQZ vkaf'kd :i ls vk;fur gksrs gSa] mUgsa nqcZy vEy dgrs gSaA tSls &dkcksZfud vEy (H_2CO_3), ,slhfVd vEy (CH_3COOH), nqcZy vEy gSA cksfjd vEy (H_3BO_3) Hkh ,d nqcZy vEy gS] ftldk mi;ksx ,VhlsfIVd d:i esa gksrk gSA

iz'u 10- foy;u esa mifLFkr vEy dh ek=k ds vuqlkj vEyksa dk foHkktu fdu oxksa esa fd;k tkrk gS\ o.kZu djsaA

mÙkj & fo;yu esa mifLFkr vEy dh ek=k ds vuqlkj vEyksa dk nks oxksa esa ckaVk x;k gS&

(i) lkæ vEy (Concentrated Acid) – tc foy;u esa vEy dh vfèkd ek=k mifLFkr jgrh gS rks mls lkæ vEy dgrs gSaA
lkæ vEy esa ty dh ek=k de jgrh gSA

(ii) ruq vEy (Dilute Acid) – tc foy;u esa vEy dh ek=k de jgrh gS rks mls ruq vEy dgrs gSaA
ruq vEy esa ty dh ek=k vfèkd jgrh gSA

iz'u 11- vEy rFkk {kkj ds vkjgfu;l fl)kUr dh lhekvksa dk mYys[k djsaA

mÙkj & vkjgfu;l fl)kUr ds nks"k fuEufyf[kr gSa &

(i) bl fl)kUr ds vuqlkj vEy **H** ;qDr ;kfxd gSa vkSj {kkj **OH** ;qDr ;kfxd gSaA yfdu dN ,sls {kkj gSa ftuesa **OH** ugha jgrkA bu vEyksa rFkk {kkjksa dh 0;k[;k bl fl)kUr ds vkèkkj ij ugha dh tk ldrhA

(ii) æo vekfu;k esa **NH_4NO_3** dk vkpj.k vEyh; gksrk gSA bldh 0;k[;k bl fl)kUr ds vkèkkj ij ugha dh tk ldrhA

(iii) tyh; foy;u esa **HCl** rks vEy ekuk tkrk gS fdUrq xSlh; voLFkk esa ;k vU; foyk;d ¼tSls&cSathu½ esa vEy ugha ekuk tkrkA

iz'u 12- vk;uhdj.k d vkèkkj ij HkLeksa dk fdruk Hkkxksa esa ckVk x;k gS \ o.kZu djsaA

mÙkj&vk;uhdj.k d vkèkkj ij HkLeksa dk nks oxksZa esa ckVk x;k gS&

(i) *izcy HkLe* **(Strong base)-** *o HkLe tks tyh; foy;u esa iw.kZr% vk;fur gksdj dkQh ek=k esa gkbMªkDlkbM vk;u* **(OH^-)** *mRiUu djrs gSaA mUgsa izcy Hk"e ;k izcy {kkj dgrs gSaA tSls&***NaOH, KOH** *izcy Hk"e gSaA*

(ii) *nqcZy HkLe* **(Weak base)**& *o HkLe tks tyh; foy;u esa flQZ vkaf'kd% vk;fur gksdj de ek=k esa gkbMªkDlkbM* **(OH^-)** *mRiUu djrs gSaA mUgsa nqcZy HkLe ;k nqcZy {kkj dgykrs gSaA tSls&vekfu;e gkbMªkDlkbM* (NH_4OH), *dSfY'k;e gkbMªkDlkbM* **$Ca(OH)_2$** *A*

iz'u 13- lwpd **(Indicator)** *fdls dgrs gSa \ ;s fdrus izdkj ds gksrs gSa \ ifjHkkf"kr djsaA*

mÙkj&lwpd ,sls inkFkZ gksrs gSa tks viuh jx ifjorZu d }kjk inkFkZ d vEyh; ;k {kkjh; ;k mnklhu gksus dh lwpuk nsrs gSaA

rhu lkekU; lwpd fyVel i=] feFkkby vkjsat rFkk QhukWYQFkfyu gSaA lwpd dk vEy {kkjd lwpd Hkh dgrs gSaA

;s nks izdkj d gksrs gSa&

(i) *ikÑfrd lwpd* & *ikÑfrd lwpd d vrxZr fyVel i= rFkk gYnh vkrs gSaA pqdUnj] yky xkHkh iÙkkA*

(ii) *l'ys"kr lwpd* & *bld vrxZr feFkkby vkjsat rFkk fQukWYQFkfyu gSaA*

*iz'u 14- xg fufeZr lwpd vki dSls cuk;saxs *

mÙkj &gYnh d NksVs&NksVs VqdM+s dks ty d lkFk xje dj Nku ysrs gSaA gYnh ls ikIr foy;u dks nks vyx&vyx ij[kufy;ksa esa ysrs gSaA ,d ij[kuyh esa lkcqu dk foy;u Mkyrs gSaA ij[kuyh d foy;u dk ihyk jax yky&Hkwjs jax esa cnyrk gS] ftls lkcqu d {kkjh; gksus dh igpku gksrh gSA nwljh ij[kuyh esa fljdk Mkyrs gSaA fljdk ij[kuyh esa j[k foy;u d jax esa dksbZ ifjorZu ugha djrkA vr% fljdk vEyh; gSA

*iz'u 15- vEyksa dh 'kfDr d ckjs esa vki D;k tkurs gSa \ fdu&fdu rjhdksa ls vEyksa dh 'kfDr dh rqyuk dh tk ldrh gS *

mÙkj & vEy d tyh; foy;u esa vEy }kjk ikIr gkbMªkstu vk;uksa dh ek=k ls mldh vEyh; 'kfDr dk fuèkkZj.k gksrk gSA

निम्न तरीकों से अम्लों की तुलना की जा सकती है–

(i) *vEy d lkr d vkèkkj* & *tSls&dkcZfud ;kfxd & ikèkkj ls ikIr vEy &lkbfVªd vEy] vkDtsfyd vEyA*

(ii) *vkf.od lajpuk d vkèkkj ij vEy & gkbMªk vEy &* **HCl, HBr, HI**

(iii) *icy vEy d vkèkkj ij & vEy tyh; foy;u e i.kr% vk;fur gkrk g ftld vk;uhdj.k dk v'k yxHkx 100%* **gkrk gA**

iz'u 16- yo.k fdl dgr g\ ;s fdru idkj d gkr g\ ifjHkkf"kr djA

mÙkj & yo.k o ;kfxd g ftudk fuekZ.k fdlh vEy dk fdlh {kkjd d vfHkfØ;k d QyLo:i gkrk g ,o ftle vEy v.k d ;kfxd e mifLFkr gkbMªkstu ijek.k fdlh èkkr }kjk foLFkkfir gkr gA

mnklhuhdj.k vfHkfØ;k e dkbZ vEy fdlh {kkjd d lkFk vfHkfØ;k dj yo.k ,o ty cukrk gA

tl &lkfM;e gkbMªkDlkbM ,o gkbMªkDyksfjd vEy d mnklhuhdj.k vfHkfØ;k e lkèkkj.k ued yo.k ,o ty cukr gA

NaOH + HCl ⟶ NaCl + H_2O

yo.k d idkj fuEufyf[kr g &%

(i) *lkekU; yo.k* **(Normal Salt)***&og yo.k ftlls vk;uZÑr* **H** *ijek.k ;k gkbMªkfDly leg ugh jgrk g] mls lkekU; yo.k dgr gA ;g vEy ,o HkkLe d i.k mnklhuhdj.k d QyLo:i curk gA tl&* **NaCl, HCl, $NaNO_3$, Na_2SO_4** *bR;kfnA*

(ii) *vEyh; yo.k* **(Acidic Salt)***&fdlh vEy d v.k e mifLFkr foLFkkiu ;kSfxd gkbMªkstu ijek.k dk èkkr }kjk v'kr% foLFkkfir dju d QyLo:i cu yo.k dk vEyh; yo.k dgr gA*

vFkok

o yo.k tks fdlh HkkLe }kjk fdlh vEy d vi.k mnklhuhdj.k d QyLo:i cur g] mls vEyh; yo.k dgr gA ble foLFkkiu ;kSfxd gkbMªkstu gkr gA tl& **$NaHSO_4$, $KHSO_4$,** *bR;kfn A*

(iii) *HkkLeh; yo.k* **(Basic Salt)***&o HkkLe ftud v.k e ,d ls vf/kd* **OH** *leg gkr gA vEyksa }kjk vkfxd :i ls mnklhu gkdj HkkfLed yo.k cukrk gA tl &* **$Pb(OH)NO_3$.** *ble foLFkkiu ;kSfxd gkbMªkDlkbM eyd gkr gA*

iz'u 17- **pH** *d vkèkkj ij yo.kksa dk oxhdj.k djA*

mÙkj &vEy vkj HkkLe dh iÑfr ;k **pH** *vkèkkfjr yo.kksa d foLFkkiu rhu rjg d gkr g&%*

(i) *mnklhu yo.k foy;u* **(Natural Salt Solution)***&icy vEy ,o icy HkkLe d yo.k foy;u mnklhu gkr gA budk* **pH** *eku* **7** *gkrk gA ;s*

fyVel dk jx ifjorlu ugh djrA tls&**NaCl, KCl, $NaNO_3$, Na_2SO_4** bR;kfn A

(ii) vEyh; yo.k fo;yu **(Acidic Salt Solution)**– icy vEy ,oa ncy HkLe d yo.k foy;u vEyh; gkrs gA bldk **pH** eku **7** ls de gkrk gA ;s fyVel dk yky jx uhyk esa ifjofrr djrs gA tls&**NH_4Cl, $(NH_4)_2SO_4$** A

(iii) HkLeh; yo.k foy;u **(Basic Salt Solution)**– icy HkLe ,oa ncy vEy d yo.k foy;u {kkjh; gkrs gA budk **pH** eku **7** ls vfèkd gkrk gA tls - **Na_2CO_3, K_3PO_4** bR;kfnA

iz'u 18- yo.k d lkekU; x.kksa dk fy[kA

mÙkj & yo.k d x.k fuEufyf[kr gS&%

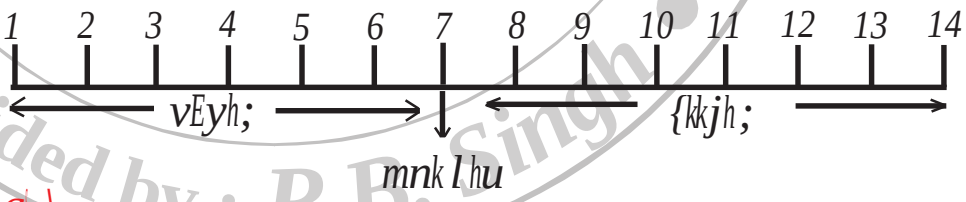
(i) icy vEy rFkk icy HkLe ls cus yo.kksa dk tyh; foy;u mnklhu gkrk gS rFkk foy;u dk **pH** eku 7 gkrk gA tls **- KCl, NaCl, KNO_3** bR;kfnA

(II) icy vEy rFkk ncy HkLe ls cus yo.kksa dk tyh; foy;u vEyh; gkrk gA tls - **NH_4Cl, $FeCl_3$, $FeSO_4$** bR;kfnA

(iii) ncy vEy rFkk icy HkLe ls cus yo.kksa dk tyh; foy;u {kkjh; gkrk gS rFkk foy;u dk **pH** eku 7 ls vfèkd gkrk gA tls - **Na_2CO_3, $NaHCO_3$, CH_3COONa** bR;kfnA

iz'u 19- pH Ldy D;k gS \ (SPL)

mÙkj &1909 esa lkjUlu us H^+ vk;u dh lkUnzrk dks 0;Dr djus ds fy, **pH** fpà dk mi;ksx fd;kA ble 0 ls 14 rd dh l[;k,a gksrh gA bls **pH** Ldy dgk tkrk gA



**iz'u 20- pH eku D;k gS **

mÙkj &xkse v.k ifr yhVj esa 0;Dr gkbMªkstu vk;uksa ds lkUnzrk ds _.kkRed y?kqx.kd dk **pH** eku dgk tkrk gA

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

'kq) ty dk **pH** eku 7 gkrk gA

**iz'u 21- pH eku dk D;k egRo gS **

mÙkj & gekjs nSfud thou esa **pH** vR;Ur egRoiw.kZ LFkku j[krk gA bldk egRo

fuEufyf[kr g\&%

(i) ty dk **pH** eku Kkr djds irk yxk;k tkrk g\ fd ty fdl dk;Z ds fy, mi;qDr g\A

(ii) jDr dk **pH** eku Kkr djds irk yxk;k tkrk g\ fd jDr 'kq) g\ ;k v'kq)A

(iii) feVVh dk **pH** eku Kkr djds irk yxk;k tkrk g\ fd bl esa dkSu&lh Qly mxk;h tk ldrh g\A

(iv) vuqd jlk;fud vfHkfØ;k;sa **pH** }kjk fu;a=r dh tkrh g\A tSl&ty vi?kVu vfHkfØ;k] fd.ou bR;kfnA

(v) ikpu r= ds **pH** dk irk yxkdj jksxksa dh tkudkjh ikIr dh tkrh g\A **(1.0)**

(vi) nkrksa ds **pH** eku esa ifjorZu gksus ij nkr u"V gksus yxrs g\A **(5.5)**

(vii) ty dk **pH** ,d fuf'pr lhek ds vUnj jgus ij jgus okys tyh; thoksa thfor jgrs g\A

iz'u 22- mnklhuhdj.k vfHkfØ;k ls vki D;k le>rs gSa \ mnkgj.k }kjk le>kvksA

mÙkj &vEy rFkk {kkjd ds vfHkfØ;k ds QyLo:i yo.k rFkk ty curk g\A mls mnkslhuhdj.k vfHkfØ;k dgrs g\A

$$NaOH + HCl \longrightarrow NaCl + H_2O$$

*iz'u 23- uVy ikèk (cVh) dh D;k fo'ks"krk g\ *

mÙkj &uVy ,d 'kk[kh; ikèkksa g\ tks txyksa esa mifLFkr g\A bldh ifÙk;ksa esa Mdusa cky gksrs g\A vxj xyrh ls Nw fy;k tk, rks Mad tSlk nwa gksrk g\A buckyksa esa eFkukbd vEy dk lksa gksus ds dkj.k nwa gksrk g\A Mad ekjus ds LFkku ij Mkd ikèk dh iÙkh jxMus ij bykt gks tkrk g\A ;s ikèk vfèkdrj uVy ds ikl ik;s tkrs g\A Mkd ikèkksa ls dNw HkLe ;k {kkj fudyrs g\] tks vEy ds iHkko dk mnklhu dj nsrs g\A

*iz'u 24- vPNs Qly ds fy, feVVh dk **pH** eku **5.5 – 7.0** gksuk pkfg,A fdlku feVVh esa puk D;ksa feykrs g\ *

mÙkj & feVVh dk **pH** eku **5.5 – 7.0** ds chp jgus ij Qly vPNs gksrs g\A feVVh ds vR;fèkd vEyh; ;k {kkjh; gksus ij ikèkksa dh of) ckfèkr gks tkrh g\A feVVh ds vfèkd vEyh; gksus ij mlesa dyh puk] Hk[kjk puk ;k dfY'k;e dkcksZusV Mkyus ls **pH** fu;a=r fd;k tkrk g\A bu jklk;fud inkFkksZa ds HkkfLed gksus ds dkj.k ;s feVVh ds vfrfjDr vEyh;rk dks de dj nsrs

gA vr% fd lku puk feykrk gA

iz'u 25- {kkjk d egRoi.k jklk;fud x.kk dk fy[kA

mÙkj & {kkjk d egRoi.k jklk;fud x.k fuEufyf[kr g&%

(i) èkkrqvk lfØ;k &{kkj dN èkkrqvk lfØ;k dj H_2 xSl mRiUu djrk gA

$$Zn + 2NaOH \longrightarrow Na_2ZnO_2 + H_2$$

¼lkfM;e ftadV½

(ii) ok;q lfØ;k & dN {kkj ok;q esa mifLFkr CO_2 lfØ;k djrk gA

$$2NaOH + CO_2 \longrightarrow Na_2CO_3$$

(iii) vEyk lfØ;k &{kkj vEyk lfØ;k djds yo.k r;kj djrk gA

$$NaOH + HCl \longrightarrow NaCl + H_2O$$

(iv) yo.kksa lfØ;k & rkcck] ykgk] ftad vkfn d yo.k {kkjk lfØ;k djrk gS] vkj v?kqyu'khy èkkfRod gkbMªkDlkbM r;kj djrk gA

$$ZnSO_4 + 2NaOH \longrightarrow Na_2SO_4 + Zn(OH)_2$$

iz'u 26- gekjs nSfud thou esa vEyksa d pkj mi;ksx crkvksA

mÙkj &gekjs nSfud thou esa vEy d mi;ksx fuEufyf[kr g&%

(i) fljdk gekjs Hkkstu dk idkus vkj mldh lqj{kk rFkk vkpkj cukus esa dke vkrk gA

(ii) gekjs iVs esa **HCl** gkfudkjd thok.kqvksa dk u"V dj nsrk gA tks Hkkstu d lkFk igp tkrs gA

(iii) VkjVfjd vEy cfdx ikmMj cukus esa dke vkrk gA

(iv) dkcfud vEy iz; inkFkksa esa izfrDr gksrk gA

iz'u 27- vEyksa dh gekjs thou esa D;k gkfu;k gS \

mÙkj &vEyksa ls gkuokyh gkfu;k fuEufyf[kr g&%

(i) ;s ltho dkf'kdkvksa dk u"V djrs gA

(ii) lkns vEy Ropk vkj dksey vxksa dk xHkhj {kfr igqapkrs gA

(iii) dN [kk| inkFkksa dk [kjkc dj nsrs gA

iz'u 28- lkfM;e DykjkbM ¼lkèkkj.k ued½ dls cuk;k tkrk gS \ bld nks e[; jklk;fud x.k rFkk mi;ksx crkvksA

mÙkj&xesa lkfM;e ij Dykjhu xSl izokfgr djus ij lkfM;e DykjkbM curk gA

$$2Na + Cl_2 \longrightarrow 2NaCl$$

jklk;fud x.k&%

(i) ;g ,d vk;fud ;kfxd gS] tks vfr ?kqyu'khy gA

(ii) ;g ,d 'or jksnkj inkFk gSA

mi;ksx &%

(i) Hkkstu cukus esA

(ii) gkbMªkstu DykjkbM **(HCl),** cfdx ikmMj] lkfM;e ckbdkcksusV] lkfM;e gkbMªkDlkbM vkfn dh fuekZ.k esA

iz'u 29- lkèkkj.k ued dh ikfIr dgk&dgk gksrh gS \ Li"V djsA

mÙkj & lkèkkj.k ued fuEufyf[kr lkrksa ls ikIr gksrk gS&%

(i) *leqæh ty&lesa dsoy [kkjs ty dk cM&cM xM<ksa esa ,d= dj lks;s dh idk'k esa okf"pr gksus nsrs gSA ok"iu ds ckn Bksl ued dsoy ikIr gksrs gSA*

(ii) *[kfut ued ¼[kkuksa ;k pVVkuksa ls½&vkLVfly;k esa ued [kkuksa ls fudkyk tkrk gSA blds fy, tehu dh vnj ,d iEi ?kqlkrs gSa] ftlesa rhu lsUnh ukfy;k gksrh gSA ckgj okyh uyh ls xeZ ty vnj iap'k djk;k tkrk gS] ftlls ued dk foy;u rS;kj gksrk gSA lcls vnj okyh uyh ls gkdj mPp nkc ij gok dk >ksdk vnj Hkstk tkrk gSA ued dh foy;u dk chp okyh uyh ls gkdj ckgj fudky nsrk gSA foy;u dk Nkudj okf"pr dju ij ued ikIr gksrk gSA*

(iii) *>hyksa ls & jkstLFkku dh lkHkj >hy] vefjdk dh xsV lkYV ysd] :l dh ysd ,YVu ls Hkh ued rS;kj gksrk gSA bls ty dh ok"ihdj.k ls ikIr fd;k tkrk gSA*

*iz'u 30- lkèkkj.k ued gok esa D;k ilhtus yxrk gS *

mÙkj &lkèkkj.k ued esa v'kf) dh :i esa eSxuhf'k;e DykjkbM jgrk gSA **$MgCl_2$** *,d iLonh inkFk gS tks ueh lks[krk gSA blh dkj.k lkèkkj.k ued [kyh gok esa j[kus ij ilhtus yxrk gSA*

iz'u 31-lkfM;e gkbMªkDlkbM **(NaOH)** *dls cuk;k tkrk gS \ bldh mi;ksx crkvksA*

mÙkj&lkfM;e gkbMªkDlkbM dk Dykj ,Ydyh fofèk }kjk cuk;k tkrk gSA bls dkfLVd lksMk Hkh dgrs gSA bls fo|qr vi?kVu fofèk }kjk cuk;k tkrk gSA lkfM;e DykjkbM ds tyh; foy;u esa fo|qr èkkjk izokfgr djus ij ;g vi?kfVr gksdj lkfM;e gkbMªkDlkbM] Dykjhu rFkk gkbMªkstu cukrk gSA

$$2NaCl + H_2O \longrightarrow 2NaOH + Cl_2 + H_2\uparrow$$

mi;ksx&%

(i) èkkrqvksa ds xgus cukus esA

(ii) lkcqu] vkesksfud rFkk dkxt ds fuekZ.k esA

(iii) Ñf=e Qkbcj] Ñf=e oL=] j'k vkfn ds fuekZ.k esA

i'u 32- lkfM;e ckbdkckuV ;k [kku dk lkMk dl cuk;k tkrk g\ bldk nk e[; jklk;fud x.k rFkk mi;kx crkoA

mÙkj &lkfM;e ckbdkckuV dk vekfu;k lkMk fofèk ;k lkYo fofèk }kjk cuk;k tkrk gA

lkfM;e dkckuV d tyh; ?kksy e **CO_2** xl iokfgr dju ij lkfM;e ckbdkckuV dk vo{ki ikIr gkrk gA

$$Na_2CO_3 + H_2O + CO_2 \longrightarrow 2NaHCO_3$$

jklk;fud x.k &%

(i) ;g ,d joknkj lQn Bkl inkFk gA

(ii) [kkuk idkr le; tc ;g xe gkrk g rk ;g lkfM;e dkckuV] ty rFkk dkcu MkbvkDlkbM xl nrk gA vr% [kkuk dk 'kh?krk l ipku d fy, bldk mi;kx fd;k tkrk gA

$$2NaHCO_3 \xrightarrow{Å"ek} Na_2CO_3 + H_2O + CO_2$$

mi;kx &%

(i) bldk mi;kx vfXu'kked d :i e gkrk gA

(ii) bldk mi;kx cfdx ikmMj d fuekZ.k e fd;k tkrk gA

i'u 33- lkfM;e dkckuV ¼èkkou dk lkMk½ dl cuk;k tkrk g\ bldk nk e[; jklk;fud x.k rFkk mi;kx crkoA

mÙkj& bldk jklk;fud uke lkfM;e dkckuV Mdk gkbMsV gA ftldk l= **$Na_2CO_3 . 10H_2O$** gkrk gA

cfdx lkMk dk xje dju ij lkfM;e dkckuV curk gA

$$2NaHCO_3 \longrightarrow Na_2CO_3 + H_2O + CO_2$$

ikIr lkfM;e dkckuV dk ty l fØLVyhÑr dju l èkkou lkMk ikIr gkrk gA

$$Na_2CO_3 + 10H_2O \longrightarrow NaCO_3 . 10H_2O$$

jklk;fud x.k &%

(i) ;g lQn ikjn'kh joknkj inkFk gkrk gA

(ii) bldk xje dju ij ;g 10 v.k jok ty d [kk nrk gA vkj futyh; **Na_2CO_3** cukrk gA

$$Na_2CO_3 . 10H_2O \longrightarrow Na_2CO_3 + 10H_2O$$

futyh; **Na_2CO_3** dk lkMk {kkj ;k lkMk jk[k dgr gA

mi;kx&%

(i) bl dk mi;kx [kkjk ty dk e'n cuku e gkrk gA

(ii) okf'kx lkMk d :i eA

(iii) dkx t m|kx eA

(iv) dkp m|kx eA

i'u 34- mRQyu fdl dgr g\ mRQyu inf'kr dju oky ,d ;kfxd dk uke fy[kA ,d vfHkfØ;k ndj le>kvA

mÙkj&ok;q e [kyk NkM nu ij lkfM;e dkckuV jok ty [kkdj lQn i.k e cny tkrk gA bl 10 v.k e l 9 v.k fudky dj ok;qeMy e py tkr gA lQn vikjn'kd ikmMj cp tkrk g] ftl lkfM;e dkckuV ekukgkbMsV dgr gA bl fØ;k dk mRQyu dgr gA

$$Na_2CO_3 . 10H_2O \longrightarrow Na_2CO_3H_2O + 9H_2O$$

mRQyu inf'kr dju oky ;kfxd lkfM;e dkckuV gkrk gA

i'u 35- vfXu'kked ;= }kjk vkx c>ku dh fØ;k dk jklk;fud vfHkfØ;k }kjk le>kvA

mÙkj&lkfM;e ckbdkckuV dk mi;kx vfXu'kked ;=k e Hkh fd;k tkrk gA vfXu'kked ;= e **$NaHCO_3$** ;k **H_2SO_4** jgr gA vkx yxu ij bl ;= dh ?kMh ij nkc Mkyk tkrk g] ftl l **$NaHCO_3$** rFkk **H_2SO_4** ijLij lEid e vkdj **CO_2** xl cukr gA ;g xl r th l ckgj fudydj vkx dk c>k nrh gA

$$2NaHCO_3 + H_2SO_4 \longrightarrow Na_2SO_4 + 2H_2O + 2CO_2\uparrow$$

i'u 36- foj t d p.k dl cuk;k tkrk g\ bl dk nk e[; jklk;fud x.k rFkk mi;kx crkvA

mÙkj&bl dk jklk;fud uke dfY';e vkDlhDykjkbM gkrk gA bl dk l= **$CaOCl_2$** gkrk gA bl Cyhfpx ikmMj ;k pu dk Dykjkbe Hkh dgr gA

Bkl 'k"d c>= pu ij **313 K** ;k **40°C** ij Dykjhu xl iokfgr dju ij foj t d p.k curk gA

$$Ca(OH)_2 + Cl_2 \xrightarrow[40^0C]{313K} CaOCl_2 + H_2O$$

jklk;fud x.k &%

(i) ;g lQn p.k g ftle Dykjhu tlh xèk gkrh gA

(ii) ;g ru **H_2SO_4** dh vYi ek=k d lkFk vfHkfØ;k dj dfY'k;e lYQsV] gkbMkDykfjd vEy rFkk vkDlhtu nrk gA

$$2Ca(OCl)Cl + H_2SO_4 \longrightarrow CaCl_2 + CaSO_4 + 2HClO$$

$$HClO \longrightarrow HCl + O$$

bl ikdkj ikIr vkDlhtu uotkr vkDlhtu gkrk gA vr% bldk mi;kx fojtd d :i e fd;k tkrk gA

mi;kx &%

(i) bldk mi;kx ty dk 'k) dju e dhVk.kuk'kd d :i e fd;k tkrk gA

(ii) dkxt rFkk diMk m|kx e fojtd d :i eA

i'u 37- dyh&puk dl cuk;k tkrk g\ bld nk e[; jklk;fud x.k rFkk miHkkx crkoA

mÙkj&bldk jklk;fud uke dfY'k;e vkDlkbM **(CaO)** gA

tc puk iRFkj dk 1000℃ l de rki ij ,d HkVBh e xje fd;k tkrk g rk puk&iRFkj VVdj dyh&puk rFkk CO_2 cukrk gA

$$CaCO_3 \xrightarrow{797^0C\text{-}997^0C} CaO + CO_2\uparrow$$

jklk;fud x.k %&

(i) ;g lQn cjoknkj inkFk gA bldk no.kkd **2597℃** gkrk gA

(ii) ;g ty l ifrfØ;k dj dfY'k;e gkbMkDlkbM rFkk Å"ek eDr djrk gA

$$CaO + H_2O \longrightarrow Ca(OH)_2\downarrow + Å"ek$$

bl c>k puk Hkh dgrs gA bl ifØ;k dk Hkjduk ;k ikIr pu dk Hkjdh puk dgk tkrk gA

jklk;fud x.k &%

(i) lhesV m|kx eA

(ii) Cyhfpx ikmMj cukus eA

(iii) dkp d mRiknu eA

i'u 38- IykLVj vkQ ifjl d cuk;k tkrk g\ bld nk e[; jklk;fud x.k rFkk mi;kx crkoA

mÙkj&bldk jklk;fud uke dfY'k;e lYQV vèkgkbMsV gA ftldk l= **CaSO4** . $\frac{1}{2}$ **H_2O** gkrk gA

bl vèkty;kftr dfY'k;e lYQV dgrs gA bl l{ki e **P.O.P** dgk tkrk gA

ftIle dk bLikr d cjru e **100℃** rki ij xje dju ij ;g ty d $1\frac{1}{2}$ v.kvk dk R;kx dj IykLVj vkQ ifjl curk gA

$$CaSO_4 . 2H_2O \xrightarrow{100°C} CaSO_4 . \frac{1}{2} H_2O + \frac{3}{2} H_2O$$

jklk;fud x|.k &%

(i) *;g ,d lQsn p|.k gSA*

(ii) *ty dh lkFk feydj ;g dMk rFkk fNn;qDr cu tkrk gSA*

mi;ksx&%

(i) *'kY; fpfdRlk esa Hkh gfM~M;ksa dk tksMus esA*

(ii) *efr|;ksa dk lkpk cukus esA*

(iii) *vfXujks/kd inkFkksa cukus esA*

i'u 39- fuEu dh dkj.k crkvks &

(i) *ihry rFkk rkcs dh cjru esa ngh rFkk [kVVs inkFkksa D;ksa ugha j[kuk pkfg, *

mÙkj&ngh rFkk [kVVs inkFkksa esa vEy gksrk gSA vEy /kkrqvksa ls vfHkfØ;k dj yo.k rFkk H_2 *xSl cukrs gSA ftlls inkFkksa [kkus ;ksX; ugha jgrs gSA lkFk gh ngh ,oa [kVVs inkFkksa dks rkcs dh cjruksa esa j[kk tk,xk rks vEy dh fØ;k dh dkj.k cjru lq{kkfjr gks tk,xkA*

(ii) *vEy dk tyh; foy;u fo|qr dk pkyu D;ksa djrk gS *

*mÙkj&vEy ty esa ?kqydj /ku ,oa _.k dk fuekZ.k djrk gS *

$$HCl \longrightarrow H^+ + Cl^-$$

(iii) *'k"d gkbMªkDyksfjd xSl fyVel i= dk jax D;ksa ugha cnyrk gS *

mÙkj&'k"d gkbMªkDyksfjd xSl esa gkbMªkstu vk;u **(H^+)** *ugha jgrs gSA blfy, ;g vEyh; vfHkyk{kf.k inf'kZr ugha djrk gSA ftldh dkj.k fyVel i= dh jax dk ugha cnyrh gSA*

(iv) *vklor ty esa fo|qr dk pkyu D;ksa ugha gksrk cfYd o"kkZ ty esa gksrk gS *

mÙkj&vklor ty esa dkbZ vk;fud ;kSfxd foy; ugha gksrA ftldh dkj.k ;s vk;uksa esa fo?kfVr ugha gksrs gSA o"kkZ ty ok;qeaMy ls gksrs gq, Hkwfe ij fxjrs le; ok;q dh vEyh; xSlksa **CO_2, SO_2, NO_2** *bR;kfn dk ?kqyk nsrk gSA ftlls fofHkUu idkj dh vEy Øe'k% dkcfud vEy* **(H_2CO_3),** *lYQ;qjl vEy* **(H_2SO_3),** *ukbVªl vEy* **(HNO_2)** *;k ukbfVªd vEy* **(HNO_3)** *cukrs gSA ;s vEy vk;uksa esa fo?kfVr gksrs gSA blfy, o"kkZ ty fo|qr dk pkyu djrs gSA*

(v) ty dh vuifLFkfr esa vEy dk 0;ogkj vEyh; D;k ugh gkrk \

mÙkj&vEy dksoy ty dh mifLFkfr esa gkbMªkstu vk;u mRiUu djrs gSA gkbMªkstu vk;u dh mifLFkfr dk dkj.k vEyksa dk 0;ogkj vEyh; gkrk gSA vr% ty dh vuifLFkfr esa gkbMªkstu vk;u ugh cursA bl dkj.k vEy viuk vEyh; 0;ogkj ugh djrkA

iz'u 40- rkt+s nèk dk **pH** eku 6 gkrk gSA ngh cu tkus ij bldk **pH** eku esa D;k ifjorZu gkxk \

mÙkj&ngh esa ykfDVd vEy gkrk gSA vFkkZr tc nèk ls ngh cu tkrk gS rks og vfèkd vEyh; gks tkrk gSA blfy, n/k **pH** dk eku 6 ls de gks tk,xkA

iz'u 41- ,d Xokyk rkt+s nèk esa FkkMk cfdz lkMk feykrk gSA

(a) rkt+k nèk dk **pH** eku dk 6 ls cny dj FkkMk {kkjh; D;k cuk nsrk gS \

(b) bl nèk dk ngh cuus esa vfèkd le; D;k yxrk gS \

mÙkj&**(a)** nèk esa cfdz lkMk feykdj {kkjh; cuk fn;k tkrk gSA rkfd nèk vfèkd le; rd jg ldsA vFkkZr nèk QVs ughA nèk QVus dk rkRi;Z gS nèk dk [kVVk gks tkukA

(b) ,sls nèk esa ngh cuus esa vfèkd le; blfy, yxrk gS fd {kkjh; nèk igys mnklhu gksrk gS rc ngh curk gSA vr% nèk dk ykfDVd vEy dk igys mlesa mifLFkr {kkj dk mnklhu djuk gksrk gS rc ngh curk gSA

iz'u 42- vkidk rhu ij[kufy;ksa nh xbZ gSA blesa ls ,d esa vklor ty ,oa 'k"k nk esa ls ,d esa vEyh; foy;u rFkk nwljs esa {kkjh; foy;u gSA ;fn vkidk dksoy yky fyVel i= fn;k tkrk gS rks vki iR;sd ij[kuyh esa j[ks x;s inkFkZ dh igpku dSls djsaxs \

mÙkj&yky fyVel i= dk ckjh&ckjh ls rhuksa ij[kufy;ksa esa Mkyrs gSA tks foy;u yky fyVel i= dk uhyk dj nsrk gSA og {kkjh; foy;u gSA

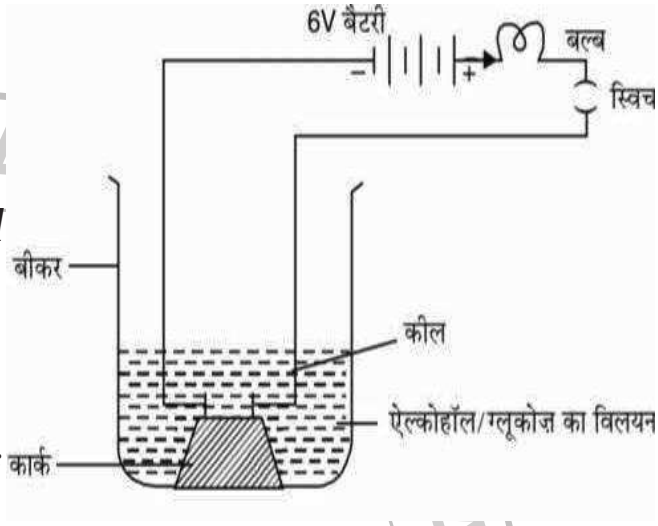
vc uhyk gq, fyVel i= dk ckjh&ckjh ls 'k"k nk ij[kufy;ksa esa Mkyrs gSA tks foy;u uhyk fyVel i= dk yky dj nsrk gSA og vEyh; foy;u gSA

'k"k cpk foy;u vklor ty gSA blesa yky ,oa uhys fyVel i= ij dkbZ izHkko ugh iMrk gSA

i'u 43- ,Ydkgky ,o Xydkt tls ;kfxdk e Hkh gkbMkt u gkrs g] yfdu budk oxhdj.k vEy dh rjg ugh gkrk gA ,d fØ;kdyki }kjk bl lkfcr djsA

mÙkj&,Ydkgy ,o Xydkt ty e ?kyus ij gkbMkt u vk;uk (H^+) d :i e vFkkr ;s vk;uk e fo?kfVr ugh gkrs gA blfy, budk ?kksy fo|qr dk pkyu ugh djrs gA

bl lkfcr dju d fy, fp=kuqlkj midj.kksa dk lt;k tkrk gA chdj e vYdkgy dk ?kksy yrs gA ble fo|qr èkkjk izokfgr dh tkrh gA ge ikrs g fd cYc ugh tyrk gA bl fl) gkrk g fd ,Ydkgy dk ?kksy fo|qr dk pkyu ugh djrk gA



Page No. 20, Fig. 2.2

ge chdj e Xydkt dk ?kksy yqdj i;ksx dk ngjkrs gA cYc fQj Hkh ugh tyrk gA bl fl) gkrk g fd Xydkt dk ?kksy Hkh fo|qr dk pkyu ugh djrk gA vr% ,Ydkgy rFkk Xydkt tls ;kfxdk e gkbMkt u gkrs g, Hkh budk oxhdj.k vEy dh rjg ugh gkrk gA

i'u 44- D;k gkrk g tc&

(i) ru lY¶;fjd vEy dh vfHkfØ;k tLrk l gkrh gA

(ii) ru gkbMkDykfjd vEy dh vfHkfØ;k e xuhf'k;e l gkrh gA

(iii) ru lY¶;fjd vEy dh vfHkfØ;k ,Y;qfefu;e l gkrh gA

(iv) ru gkbMkDykfjd vEy dh vfHkfØ;k ykgk l gkrh gA

(v) ru lY¶;fjd vEy e Bkl lkfM;e dkcksZuV feykus ij xSl mRlftZr gksrh gA

(vi) ru lY¶;fjd vEy] nkuunkj ft d d lkFk vfHkfØ;k djrk gA

mÙkj&**(i)** ru lY¶;fjd vEy dh vfHkfØ;k tLrk l djk;h tkrh g rk ftd lYQsV rFkk gkbMkt u xSl curk g

$$Zn + H_2SO_4 \longrightarrow ZnSO_4 + H_2\uparrow$$

(ii) ru gkbMkDykfjd vEy dh vfHkfØ;k tc e xuhf'k;e l djk;h tkrh g rk e Xuhf'k;e DykjkbM rFkk gkbMkt u xSl curk gA

$$Mg + 2HCl \longrightarrow MgCl_2 + H_2\uparrow$$

(iii) ru lY¶;fjd vEy dh vfHkfØ;k ,Y;fefu;e l djk;h tkrh g rk ,Y;fefu;e lYQV rFkk gkbMªkt u x l curk gA

$$2Al + 3H_2SO_4 \longrightarrow Al_2(SO_4)_3 + 3H_2\uparrow$$

(iv) ru gkbMªkDykfjd vEy dh vfHkfØ;k ykgk l djk;h tkrh g rk Qjl Dykjkb M curk g rFkk gkbMªkt u x l eDr gkrh gA

$$3Fe + 6HCl \longrightarrow 3FeCl_2 + 3H_2\uparrow$$

(v) ru lY¶;fjd vEy e lkfM;e dkcksZuV feykr g rk lkfM;e lYQV curk g rFkk H_2O ,o CO_2 cur gA

$$Na_2CO_3 + H_2SO_4 \longrightarrow Na_2SO_4 + H_2O + CO_2\uparrow$$

fofHkUu foy;uk dk pH eku

foy;u	—	pH eku
vek'k; jl	—	1
uhcw jl	—	2.5
fljdk	—	3.0
VekVj jl	—	4.1
ilhuk	—	4.5
vEy o"kkZ	—	5.6
iw.kZ kc	—	6
n/k	—	6.5
'k) ty	—	7
vkalw	—	7.3
[ku	—	7.4
fiÙk	—	7.5–7.8
puk ty	—	11.0
ykbe ¼[kkus dk igyk½	—	8
ykbe ¼[kkus dk ckn½	—	6
uhcw jl	—	2
jä jfgr iw;%	—	10
xkt j dk jl	—	6
dkWQh	—	5
VekVj dk jl	—	4
uy dk ty	—	8
1 M NaOH	—	14
1 M HCl	—	0
ekuo 'kjhj	—	7.0 l 7.8
feYd vkWQ eSxuf'k;k [Mg(OH)$_2$]	—	10.5

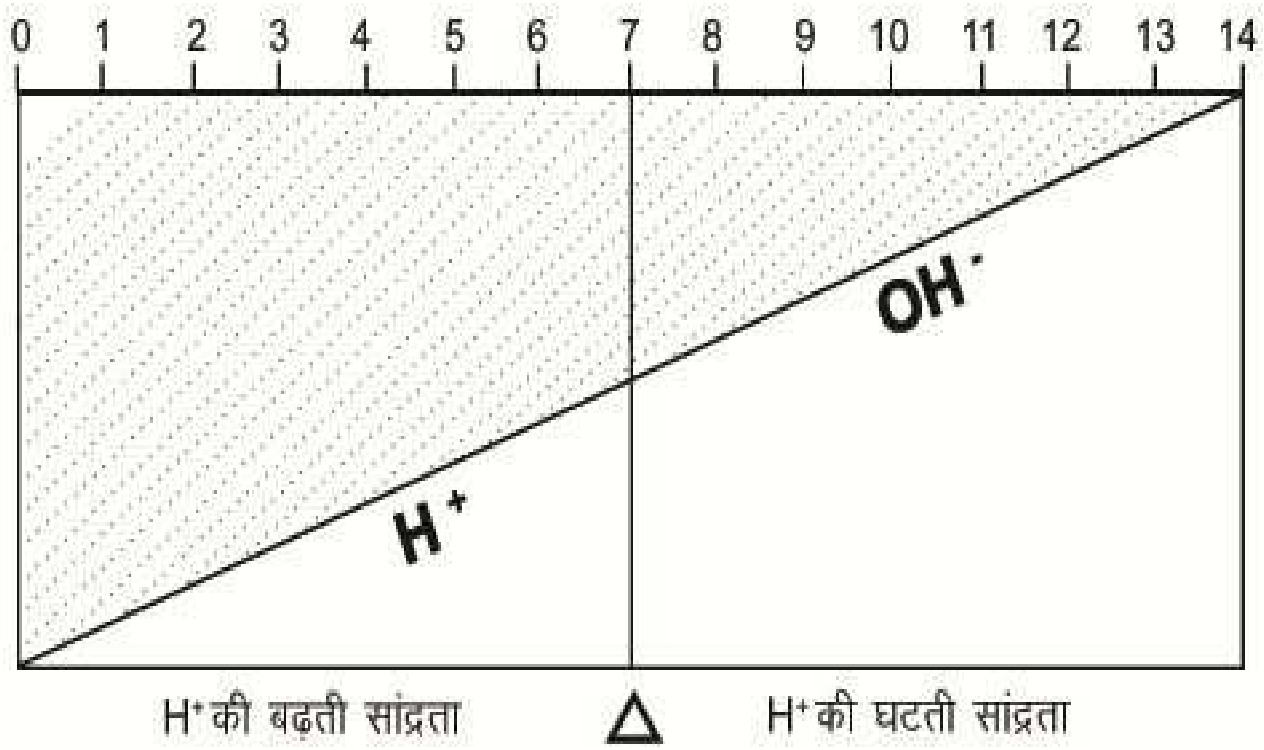
fofHkUu inkFkksZ esa mifLFkr vEy

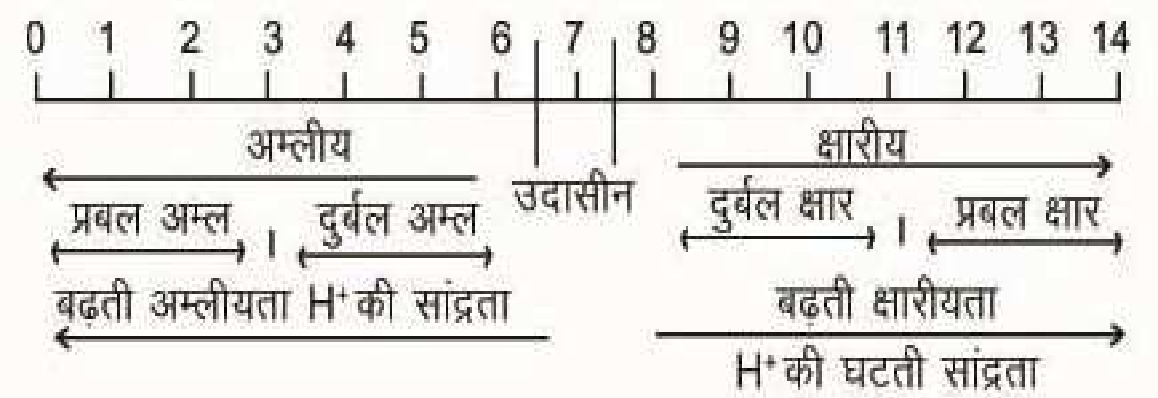
ikS/kksa ds lkr	—	vEy
fljdk	—	,lhfVd vEy
lsjsfyd	—	lkbfVªd vEy
beyh	—	VkVfjd vEy
VekVj	—	vkDtfyd vEy
[kV~Vs n/k ¼ngh½	—	ylfDVd vEy
uhcw	—	lkbfVªd vEy
phVh ¼uVy½ dk Mªd	—	eFkukbd ¼Qkfed½ vEy
lsc	—	ekfyd vEy
ve:n	—	vkDtfyd vEy
eD[ku	—	C;wVhfjd vEy
pk;	—	Vfud vEy
olk	—	LVªk;fjd vEy
e/kqeD[kh dk Mªd	—	eFkukbd vEy
I;kt	—	,LdkfcZd vEy

i'u 45- dkcfud vEy vkj vdkcfud vEy e vrj Li"V dj\

mÙkj&dkcfud vEy vkj vdkcfud vEy e fuEufyf[kr vrj g&%

S.No.	dkcfud vEy	vdkcfud vEy
1.	flfVd vEy&bl vEy dk mi;kx [kk| inkFkk d ifjj{k.k vkj Lokfn"Brk d fy, gkrk gA	x/kd dk vEy ;k lY¶;fjd vEy&bl vEy dk mi;kx cVjh] jlk;fud [kkn] iV] fMVj tV] gkbMkDykfjd vEy vkfn d fuek.k e mi;kxh gA
2.	,flfVd vEy&fljdk d :i e vpkj dk [kVVk cuku d dke e vkrk gA	gkbMkDykfjd vEy&ckFk:e lkQ dju] PVC d mRiknu e ç;Dr gkrk gA
3.	VkVfjd vEy&cfdx ikmMj cuku e ç;Dr gkrk gA	ukbfVd vEy&bl vEy dk vi;kx TNT] Mk;ukekbV vkfn foLQkVd d mRiknu e gkrk gA





S.No.		vEyh;	vEyh;
I.	fyVel	yky	uhyk
II.	efFky vkjt	yky	ihyk
III.	fQuky iFkyhu	jxghu	xykch
IV.	gYnh	ihyk	yky&Hkjk
V.	pdUnj	yky&cxuh	ihyk
VI.	yky xkHkh dk irk	yky&cxuh	gjk

46- vky QDVjh lpd D;k g\ mudk uke fy[k\

mÙkj&dN ,sls inkFk gkrs gA ftudh x/k vEyh; rFkk {kkjh; ekè;e esa fHkUu&fHkUu gkrh gA mUgsa vky QDVjh lpd dgrs gA tSls&I;kt] yox dk rsy] ofuyk b=A

jlk;fud l=

(I) lxejej & $CaCO_3$

(II) lkMk ok'k & Na_2CO_3

(III) okfllx lkMk & $Na_2CO_3.10\ H_2O$

(IV) fojtd p.k & $CaOCl_2$

(V) uhyk FkkFkk ¼rfr;k½ & $CuSO_4CO_3.5H_2O$

(VI) cfdx lkMk & $NaHCO_3$

(VII) IykLVj vkQ ifjl & $(CaSO_4)_2.H_2O$;k $CaSO_4.\frac{1}{2}H_2O$

(VIII) dkfLVd ikVkl & KOH

(IX) lkjk & $CaNO_3$

(X) ykfQx xsl & N_2O

(XI) uklknj & Na_4Cl

(XII) yky flUnj & Pb_3O_4

(XIII) yfDVd vEy & $C_3H_6O_3$

(XIV) VkVfjd vEy & $C_4H_6O_6$

(XV) Qkfeld vEy ¼eFkukbd vEy½ & $CH_{42}O_2$

(XVI)	vkDt fyd vEy	&	$C_2H_2O_4$
(XVII)	QkLQkfjd vEy	&	H_3PO_4
(XVIII)	dkcfud vEYy	&	H_2CO_3
(XIX)	,Ldkfcd vEy	&	$C_6H_8O_6$
(XX)	;fjd vEy	&	$C_5H_4N_4O_3$

	jx	PH eku		
(I)	xk<k yky **(Dark Red)**	– **0**	}	vEyh;
(II)	yky **(Red)**	– **1**		
(III)	xgjk yky **(Dark Red)**	– **2**		
(IV)	ukjxh yky **(Orange Red)**	– **4**		
(V)	ukjxh ihyk **(Orange Yellow)**	– **5**		
(VII)	gfjr ihyk **(Greenish Yellow)**	– **6**		
(VIII)	gjk **(Green)**	– **7**	}	mnk lhu
(IX)	gfjr uhyk **(Greenish Blue)**	– **8**	}	{kkjh;
(X)	uhyk **(Blue)**	– **9**		
(XI)	gfjr ihyk **(Navy Blue)**	– **10**		
(XII)	tkeuh **(Purple)**	– **11**		
(XIII)	xk<k tkeuh **(Dark Purple)**	– **12**		
(XIV)	cxuh **(Violet)**	– **13-14**		

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