APP LO
STUDY CENTRE

(Acids, Bases and salts)
TEST- 8

9^K tFgG	myF– 14	mkpyqfs> fhuqfs; kwWk; c gGfs;
10^K tFgG	myF– 9	fi uryfs;
	myF– 10	Ntjpti dfspd; ti ffs;

9^{tJ} mwptpay;
myF– 14
mkpyqfs> fhuqfs; kwWk; c gGfs;

mwpKfk;

· eki kr; RwwpAss , ej cyfk; mjpfsT Ntjpgnghul;fshy; MdJ vdgJ ehk; mwpej J. kz > fhwW> ehp kwWk; thofi ffFj; Njitahd mi dj;Jg; nghUsfSk; Ntjpg; nghUsfshy; Mdit. mtwWs; Fwpgghf mkpyqfs> fhuqfs; kwWk; c gGfs; ek; mdwhl tho;tpy; nghpUk; gadgLfpdwd. gorrhWfs> J}ai kahffpfs; (ryi tg; nghUl;fs) kUe;Jgnghrfs; ahTk; ek; mdwhl tho;tpy; Kffpa gqF tfpffpdwd. ek; clypd; tshrpi j khwwkhdJ ekJ tapwwpy; RufFk; i ` lNuhFNshhpf; mkpyjjpd; %ykhfNt ei IngWfpwJ. mkpyk; vdgJ Nrhkk> ehpy; fiuAknghOJ i ` lu[d; madpfi sj; (H$^+$) jutyyJ. mNj Nghy; fhuk; vdgJk; Nrhkk; ehpy; fiuAk; nghOJ i ` luhfirL (OH) madpfi sj; jutyyJ. mkpyKk> fhuKk; xdNwhnldhdW tpidGhpeJ eLepi y tpd tpi snghUi sj; jUfpdwd. mJNt cgG MFk; , ejg; ghlggFjpapy; , i tfi sg; gwwp ehk; tphpthff; fhz Nghk;
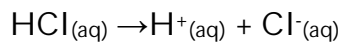
mkpyqfs;

· fNo nfhLffggl Lss ekJ mdwhl tho;tpy; gadgLjjggLk; rpy nghUl;fspd; gljijg; ghhhffTk;

· rhggpl f$ba , ej mi dj;Jg; nghUsfSk; xNu Ri ti af; nfhzl;it. mjhtJ GspgGr; Ri t. , ej GspgGr; Ri ti a vJ VwgLjjFfpwJ? mtwpy; css VNjh xU ti fahd Ntjppr; Nrhkkqfs; GspgGr; Ri ti a VwgLjjFfpdwd. , i tfs; mkpyqfs; vdwi offggLfpdwd. 'Mrpl;' vdw Mqfpyr; nrhy; 'mrpl;]" vdw , yjjpd; nkhopapypUeJ ngwggl lJ. mjd; nghUs; GspgGr; Ri t> GspgGr; Ri t nfhzl nghUsfs; mkpyqfs; vdggLk;

· 1884-Mk; Mz;L];tdd; ehl;L Ntjpapayhh;];thdN1 mh;`dpa]; mkpyqfs; kwWk; fhuqfi sg; gwwpa nfhsi fi a Kdkhopejhh; mh;`dpa]; $wWggb> mkpyqfs; ehpy; fi uAk; nghOJ H$^+$madpfi sNah myyJ H$_3$O$^+$

mkpyqfSk; %yqfSk;

%yq fs;	mk yq fs;
Mgg s;	khy pf; mk py k;
vYk p r i‚r	r p h pf; mk py k;
j‚uh l‚i‚r	l‚hh l‚h h pf; mk py k;
j‚f‚fh s p	Mf ] hy pf; mk py k;
t p d pfh;	m r p‚bf; mk py k;
j‚a h;	yh f‚bf; mk py k;
MuQ R	m ]‚fhh g pf; mk py k;
Nj‚e h;	l‚h d pf; mk py k;
t a p‚w w p‚y; Ruf ;Fk; mk py k;	i ` l NuhF Nsh h pf; mk py k;
vWk ;G> Nj‚d‚la‚p d; nfh Lf ;F	ghh k pf; mk py k;

· mad pf i sNah jUf pd‚wd. mk yq fs; xd‚W myy J mj‚w‚F Nkw g‚l‚] ,lg ng‚ah h r p‚ nraa j‚jf‚f i ` l‚u [d; mZ‚f‚f‚is sf; nfhz‚l‚i t.

· vL‚j‚Jf‚fh l‚l hf i ` l‚u [d; FNsh i‚uL eh pu‚y; f‚i uAk; ngh OJ H⁺mad pf‚i sAk‚›Cl⁻ mad pf‚i sAk; jUf pw J.

$$HCl_{(aq)} \rightarrow H^{+}_{(aq)} + Cl^{-}_{(aq)}$$

· eh py; mk py k; kwWk; fhujj‚w‚F vdd ep‚f‚Ok? ehjj f‚i ur py; kl‚Lkj‚hd; mk yq fs; mad pf‚is j; jUf pd‚wd th? i ` l‚Nuh FNshh pf; mk py k; eUl‚d t p‚d dGhn‚eJ i ` l‚u [d; mad pf‚is j; jUf pw J. eh; ,yyhj  ngh OJ i ` l‚NuhFNshh pf; mk py j‚jy; css i ` l‚u [d; mad pf‚i sg; ghh f‚f KbahJ.

$$HCl + H_2O \rightleftharpoons H_2O^+ + Cl^-$$

· i ` l‚u [d; mad pf‚fs; jdj‚Jf; fhz g gLtJ ,yi y. ,it eUl‚d; Nrhe J i ` l‚Nuhd p‚ak; (H₃O⁺) mad pfshf css d. MfNt i ` l‚u [d; mad pf‚fs; H⁺myyJ H₃O⁺Mf ,Uf ;Fk;

$$H^{+} + H_2O \rightarrow H_3O^{+}$$

---

mi dj‚J mk yq fS k; xdW myyJ mj‚w‚F Nkw g‚l‚] i ` l‚u [d; mZ‚f‚f‚i sf; nfhz‚l‚i t. Mdhy; i ` l‚u [d; css mi dj‚Jg‚ ngh Us‚fS k; mk yq fs; myy. v.fh k J‚Njd; (CH₄) kwWk; mkNkhd pah (NH₃) Mf‚i t i ` l‚u [idf‚ nfh z‚Lss d. Mdhy; ,it eh jj f‚i ur py; i ` l‚u [d; (H⁺) mad pf‚is j; juhJ.

---

gyNtW mk yq fs; eh py; f‚i ue‚J vt‚thW mad pf‚i s cUth f‚f‚pd‚wd vdgij fh‚f‚f‚z‚ l ml‚l‚i z a‚p‚y; ghh f‚f‚fyhk;

mk yq fshy; cUthd mad pf‚s;

mk yq fs;	%yf‚;$W thggh L	mad pf‚s; cUthj‚y;		,lg ng‚ah h r p‚ nraaKbAk; i ` l‚u [d‚d; vz‚z‚pf‚i f
m r p‚bf; mk py k;	CH₃COOH	H⁺	CH₃COO⁻	1
ghh k pf; mk py k;	HCOOH	H⁺	HCOO⁻	1
i el h pf; mk py k;	HNO₃	H⁺	NO_3^-	1
ryg‚A h pf; mk py k;	H₂SO₄	H⁺	SO_4^{2-}	2

gh] ghh[] ; mk[yk;	H₃PO₄	H⁺	PO_4^{3-}	3

mk[yq;fs[d; ti ffs;

· mk[yq;fs; fb;ffz];thW gyNtW ti ffs[y; ti fggLj;j ggLfp;dw.

%yq;fs[d; mbggi lapy;

· fh[k mk[yq;fs; jhtuq;fs; kwWk; t[yq;Ffspy; (cap[ndq;fsp[y;) fhz ggLk; mk[yq;fs; fh[k mk[yq;fs; vdggLk; v.fh: ghi wfs; kwWk; fd[kg; nghhUs;fspy[yUe;J ngwggLk; mk[yq;fs; fh[k mk[yq;fs; vdggLk; v.fh: HCOOH, CH₃COOH.

fd[k mk[yq;fs;

· ghi wfs; kwWk; fd[kg; nghhUs;fspy[yUe;J ngwggLk; mk[yq;fs; fd[k mk[yq;fs; vdggLk; v.fh: HCl, HNO, H₂SO₄

fhuj;Jtjjj[d; mbggi lapy;

· xwi wf; fhuj;Jt mk[yk;

, i t> xU %yf;$wpy; xNu xU gj[yL nra;aggl f;$ba i ` lu[d; madpi ag; ngww mk[yq;fs; MFk; , J eh[ffi urpy; xU %yf;$W mk[yjjp;wF xU i ` lu[d; madpi aj; jUfp;wJ. v.fh. HCl, HNO₃

mk[yq;fS fF fhuj;Jtk; vdw gjjijg; gadgLj;JfpNwhk; , J mjpYss , lgngahrrp nraaf;$ba i ` lu[d; mZ ffspd; vz z[pfi af; FwggjhFk; v.fh. mrpl bf; mk[yjjpy; (CH₃COOH) ehdF i ` lu[d; mZ ffs; , Uejhk[> xNu xU i ` lu[i d klLNk , lgngahrrp nraa KbAk; vdNt , J xwi wf; fhuj;JtKi laJ.

, ul i l f; fhuj;Jt mk[yk;

· , i t ehf;ffi urpy; xU %yf;$W mk[yjjp;wF , uz L i ` lu[d; madpfi sj; jUfp;dwd. v.fh: H₂SO₄, H₂CO₃

· Kk;i kf; fhuj;Jt mk[yk; , i t ehf;ffi urpy; xU %yf;$W mk[yjjp;wF %dW i ` lu[d; madpfi sj; jUfp;dwd. v.fh: H₃PO₄

madpAWk; mbggi lapy;

· mk[yq;fs; ehpy; KOtJkhfNth myyJ gFjpahfNth fi uAk; nghOJ i ` lu[d; (H⁺) madpfi sj; jUfp;dwd. madpAWk; Mwwy; mbggi lapy; mk[yqfi s , Uti fahfg; ghpffyhk;

typ[i k kp;F mk[yq;fs;

· , ej mk[yq;fs; ehpy; KOtJkhf madpAWfp;dwd. v.fh: HCl

typ[i k Fi wej mk[yq;fs;

- ,ej mkப்yqfs; eஹ்y; gFjௗsNt madப்AWk; jd;k nfhz;li t. v.fh: CH_3COOH.

> ntggk; myyJ fjpஹ்thR myyJ Ntjபpd myyJ kpddwffjjhy; madபfi sg; ghஹ்nj Lffk; eஹ்y madபahj y; vdggLk;

nrwptpd; mbggi l app;

- nrwப்T kpF mkப்yqfs; ,J xU fi ugghdpy; mjப்fsT fi ueJss mkப்yjijf; nfhz LssJ.

eஹ்jj mkப்yqfs;

- ,J xU fi ugghdpy; Fi wej msT fi ueJss mkப்yjijf; nfhz LssJ.

mkப்yqfspd; gz Gfs;

1. mkப்yqfs; Gspgஇr; Ri t cilai t.

2. ,twwpd eஹ்jj fiuryfs; kpdrhujijf; flj;Jk> Vnddwhy> ,it madபfi sf; nfhz Lssd.

3. ,it eஞy ypk]jhis rptgghf khwWk;

4. mkப்yqfs; nrayjpwd; kpff cNyhfqfSd; tpidGhெJ i`lu[d; thAi tj; jUfpdwd.

$$Mg + H_2O_4 \rightarrow MgSO_4 + H_2\uparrow$$
$$Zn + 2HCl \rightarrow ZnCl_2 + H_2\uparrow$$
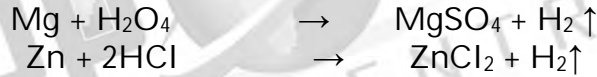
> rpy cNyhfqfs; mkப்yjJld; tpidGhெJ i`lu[id ntspNawWtjpyyy. v.fh: Ag, Cu

5. mkப்yqfs; cNyhf fhhgNdlLfs; kwWk; cNyhf i gfhhgNdlLfSld; tpidGhெJ fhhgd il Mfi ril j; jUfpdwd.

$$Na_2CO_3 + 2HCl \rightarrow 2NaCl + H_2O + CO_2\uparrow$$
$$NaHCO_3 + HCl \rightarrow NaCl + H_2O + CO_2\uparrow$$
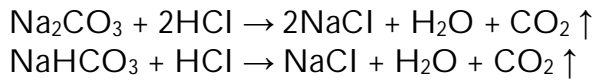
- mkப்yqfs; cNyhf Mfi rLfSld; tpidGhெJ cgi gAk> eஹ்uAk; jUfpdwd.
$$HCl + NaOH \rightarrow NaCl + H_2O$$

> nrwptT kpFej fdk mkப்yjij eஹ்fFk; NghJ kpff ftdkhf nraygl Ntz Lk; vgnghOJNk mkப்yjij eஹ்ீDs; rpwpJ rpwjhr; Nrhj;J fyfffff; nfhz NI ,Uff Ntz Lk; ,t;thW nraahhky; nrwptT kpFej mkyjjDs; eஞ ur; Nrhjjhy> mjப் msT ntggk; ntspNaw mkப்yk; nfhsnfydபyUெJ ntspNa njwpj;J clyபy; fhajjpd VwgLj;Jk;

mkப்yqfspd; gadfs;

- rygப்Ahpf; mkப்yk; Ntjpg; nghUsfspd; murd; vdwி offggLfpwJ. Vnddபy; gy Nrhkqfs; jahhpggjwF ,J gadgLfpwJ. thfd kpd;yqfspYk; ,J gadgLfpwJ.

- i ` lNuh FNshhpf; mkpyk> fopti wfi sj; J}ai kggLj;Jk; nghUshfg; gadgLfpwJ.

- rplhpf; mkpyk; c z Tg; nghUsfi sg; gjiggLjjg; gadgLfpwJ.

- i elhpf; mkpyk; cukhfg; gadgLk; mkNkhdpak; i ` lNul; vdw Nrhkjijjak> rhaqfs> tzzg; GrRfs; kwWk; kUeJfi sAk; jahhpffg; gadgLfpwJ.

- Mf;] hypf; mkpyk; Fthhl;]; gbfjjpy; VwgLk; ,UkG kwWk; khqfdlR gbTfis Rjjk; nraaTk> kugnghUspsj; J}ai kahffTk; kwWk; fUgGffi wfis elffTk; gadgLfpwJ.

- fhhghdpf; mkpyk; fhwW miii lffggll ghdqfspy; gadgLfpwJ.

- lhhlhhpf; mkpykhdJ nuhlbr; Nrhlhtpd; xU gFjpgnghUshFk;

mkpyf; fi urypy; ehpd; gqF:
mkpyqfis ehpy; fiuAk; NghJ klLNk jqfspd; gz Gfis ntspggLj;Jk; ehpy; fiuAk; NghJ i ` lu[d; (H+) madpfi sj; jUtjhy>mJ mkpyk; vd mwpaKbfpwJ. mNj rkak; fhpkf; fiuggghdpy; mkpyqfis madpAWtjpyiy.

v.fh: i ` lu[d; FNshhi uL ehpy; fiuAkNghJ H+,Cl-madpfi sj; jUfpwJ. mNj rkak; vjjdhy; Nghdw fhpkf; fi ugghdpy; madpAwhky; %yf$Wfshfnt ,UfFk; |

,uh[jphtfk;

- cNyhfqfspy; jqfk; kwWk; ntssp klLNk HCl kwWk; HNO₃ cld; tpi dGphahJ vdgJ ehk; mwpej xdW. Mdhy; ,ej ,uz L mkpyqfspd; fyit jqfjijf; fi ufFk; jpwDssJ. mej fyit apd; ngah ,uh[jphtfk; vdggLk; ,uh[jphtfk; vdgJ %dW gqF i ` lNuhFNshhpf; mkpyk> xU gqF i elhpf; mkpyk; fyej fyit MFk; ,jd Nkhyhhh tpfpjk; 3 : 1. ,J kQrs;- MuQR epwKila Gi faf;$ba jputk; MFk; ,J jqfk; kwWk; rpy fbd cNyhfqfi sAk; mjpf mstpy; mhpkhdk; nraaf; $ba jpwd; nfhz lJ.

- ,uh[jphtfk; vdw nrhy; , yjjpd; nkhopapypUeJ ngwggllJ. ,jd nghUs; jputjjpd; murd; vdgjhFk; ,J kpFej Mwwy; nfhz lJ. ,uh[jphtfk; kpf cddjkhd epi yapy; css jqfk> gpshbdk; kwWk; ngyNybak; Nghdw cNyhfqfi sf; $l fi ufftyyJ.

Ntjp thagghL	: 3 HCl + HNO₃
ehpy; fi ujpwd;	: fi uAk;
c UF epi y	: -42ºC (-44ºF, 231K)
nfhjpepi y	: 108ºC (226ºF, 381 K)

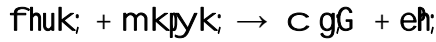## ,uh[jphtfjjpd; gad;fs;

- jqfk; kwWk; gpshbdk; Nghdw cNyhfqfi sf; fi uggjwF Kjdikahfg; gadgLjjggLfpwJ.

1. jqfij Rjjk; nraaTk> Rjjpfhpffppjk; gadgLfpwJ.

fhuq;fs;
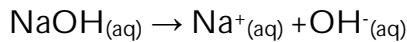
· mh;`bdpa];nfhsi fapdgb> fhuq;fs; eHpy; fiuAk; NghJ i`luhfi rL (OH⁻) madpfi sj;jUtdthFk; rpy cNyhf Mfi rLfs; mkpyqfSld; tpidGhpeJ cgigAk> ePiuAk; jUfpdwd. ,it fhuq;fs; vdW miofpggLfpdwd. eHpy; fi uAk; fhuq;fs; vhpfhuq;fs; vdwi ofpggLfpdwd. xU fhuk; mkpyj;Jld; tpid GhpeJ cgigAk> ePiuAk; kl;Lk;jUk;

    fhuk; + mkpyk; → cgG + ePh;

· vLj;Jf;fhl;lhf> [pq;f; Mfi rL (ZnO), HCl cld; tpidGhpeJ [pq;f; FNshi uL cgG kwWk; ePi uj;jUfpwJ.

    $ZnO_{(s)} + 2HCl_{(aq)} \rightarrow ZnCl_{2(aq)} + H_2O_{(l)}$
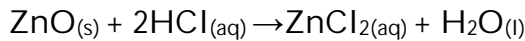
· ,Nj Nghy; Nrhbak; i`luhfi rL eHpy; madpAwW> i`luhfi rL madpfi sj; jUfpwJ. MfNt> ,J eHpy; fi ufpwJ. vdNt ,J xU vhpfhuk; MFk;

    $NaOH_{(aq)} \rightarrow Na^+_{(aq)} + OH^-_{(aq)}$

· fhuq;fs; xdW myyJ mjwF Nkwgl;l ,Igngahrrp nraajjff Mfi rL kwWk; i`luhfi rL madpfi sf; nfhz Lssd.

 fhuq;fs; eHpy; fi ueJ madpfi s cUthfFtijf; fhl;Lfpd wJ.

eHpy; fhujjpd; %yk; cUthd madpfs;

fhuk;	%yf;$W thgghL	madpfs; cUthjy;		,Igngahrrp nraajjff Mfi rL / i`luhfrpy; madp
fhyrpak; Mfi rL	CaO	Ca^{2+}	O^{2-}	1
Nrhbak; Mfi rL	Na_2O	Na^+	O^{2-}	1
nghl;lhrpak; i`luhfi rL	KOH	K^+	OH^-	1
fhyrpak; i`luhfi rL	$Ca(OH)_2$	Ca^{2+}	OH^-	2
mYkpdpak; i`luhfi rL	$Al(OH)_3$	Al^{3+}	OH^+	3

mi dj;J vhpfhuqfSk; fhuq;fs; MFk; Mdhy; mi dj;Jf; fhuqfSk> vhpfhuqfSk; myy. v.fh. NaOH kwWk; KOH vhpfhuq;fs; MFk; Al(OH)₃,kwWk; Zn(OH)₃fhuq;fs; MFk;

fhuq;fspd; ti ffs;
mkpyj;Jtjjpd; mbggilapy; fhuq;fs;

· xwi w mkpyj;Jt fhuk; ,i t eHpy; madpAwW xU %yf;$W fhujjwF xU i`luhfi rL madpi aj; jUgit. v.fh: NaOH, KOH

 ,uhji l mkpyj;Jtf; fhuk;

- , i t eh;py; madpAwW> xU %yf;$W fhujjpwF xU i ` luhfpirL madpfi sj; jUgi t. v.fh: Ca(OH)., Mg(OH).

Kkik mkpyj;Jtf; fhuk;

- , i t eh;py; madpAwW> xU %yf;$W fhujjpwF %dW i ` luhfpirL madpfi sj; jUgi t. v.fh: Al(OH)₃, Fe(OH)₃

nrwptpd; mbggi lapy; fhuq;fs;

- nrwpT kpF fhuq;fs; , i t eh;f; fi urypy> mjpf rjtPk; fhuj;ijf; nfhz Lssd.

eh;jj fhuq;fs;

- , i t eh;f; fi urypy> Fi wej rjtPk; fhuj;ijf; nfhz Lssd.

madpahjpy; mbggi lapy; fhuq;fs;

- typik kpF fhuq;fs; , i t eh;jj fi urypy; KOtJkhf madpAWfpdwd. v.fh: NaOH, KOH

- typik Fi wej fhuq;fs; , i t eh;jj fi urypy; gFjpasNt madpAWfpdwd. v.fh: NH₄OH, Ca(OH)₂

---

mkpyj;Jtk; vdgJ xU fhu %yf;$wpYss ,lgngahrprp nraaf;$ba i ` luhfrpy; njhFjpfspd; vz z pfi fahFk;

---

fhuq;fspd; gz Gfs;

1. fhuq;fs; frgGr; Ritt nfhz ;li t

2. eh;jj fi urypy; NrhgG Nghdw totogGj;jdik af; nfhz ;li t.

3. rptgG ypkl]; jhi s eey epwkhf khw;Wgit.

4. , twwpd; eh;jj fi urnfs; kpdrhujijf; flj;Jk; jpwd; ci lai t.

5. fhuqfs> c Nyhfqf;fSld; tpi dGGhpeJ c gi gAk> i ` lu[i dAk; jUfpdwd.
$$Zn + 2NaOH \rightarrow Na_2ZnO_2 + H_2\uparrow$$

6. fhuqfs> mNyhf Mfsi rLfSld; tpi dGGhpeJ c gi gAk> eEi uAk; jUfpdwd. , ej tpi dahdJ mkpyjjpwFk> fhujjpwFk; , ilNa css tpid Nghy cssjhy> mNyhf Mfsi rLf; mkpyj; jdi kAilaJ vdw KbTfF tuyhk;

7.
$$Ca(OH)_2 + CO_2 \rightarrow CaCO_3 + H_2O$$

8. fhuqfs> mkpyqfsi rLfSld; tpi dGGhpeJ c gi gAk> eEi uAk; jUfpdwd.
$$KOH + HCl \rightarrow KCl\ H_2O$$

NkNy Fwpggpl;l tpi d> fhujjpwFk; mkpyjjpwFk; ,ilNa VwgLk; eLepi yahf;fy; tpi d vdggLk;

9. mkNkhdpak; cgGfSld> fhuq;fis ntggggLj;Jk; NghJ> mkNkhdpah thA cUthfpwJ.

$$NaOH + NH_4Cl \rightarrow NaCl + H_2O + NH_3\uparrow$$

rpy cNyhfq;fs; Nrhbak; i ` luhfi rLld; tpi dGhptjpyi y. Cu, Ag, Cr.

· Nkwfz l Nrhji dfspy; kpd; tpsf;fhdJ> mkpyjjpy; klLk; xspUk; Mdhy> FSfNfh]; kwWk; Myf`hy; kpdrhujijf; fljjhJ. kpdtpsf;F xspntJ fiurypd; toNa kpdrhuk; ghafpwJ vdgj cz hj;JfpwJ. kpdrhukhdJ madpfspd; %ykhf fiurpy; vLjJr; nryyyggLfpwJ. ,Nj Nrhji dia fhuq;fshd Nrhbak; i ` luhfi rL kwWk; fhyrpak; i ` luhfi rLld; nra;J ghhf;fTk;

fhuq;fspd; gad;fs;

1. NrhgG; jahhp/f Nrhbak; i ` luhfi; rL gadgLfpwJ.

2. fl;blq;fspd;F Rzz; hkG G+r fhyrpak; i ` luhfi; rL gadgLfpwJ.

3. tapWf; NfhshWfifF; kUejhf nkfdhpak; i ` luhfi; rL gadgLfpwJ.

4. Jzpfspy; css vz nz af; fiwfis eff;Ftjw;F; mkNkhdpak; i ` luhfi; rL gadgLfpwJ.

mkpyq;fs; kw;Wk; fhuq;fisf; fz;lwpAk; Nrhji dfs;

1. ypl;k]; jhSld; Nrhji d:

mkpyk; ePy ypl;k] jhhis rptgghf khw;Wk;

2. epwq;fhl;b gpdhhjpyDld; Nrhji d:

mkpyjjpy; gpdhhjpyd; epwkwwJ. fhujjpy; , sQrptgG epwji j cUthf;Fk;

3. epwq;fhl;b nkjjpy; MuQRld; Nrhji d:

mkpyjjy; nkjjpy; MuQR , sQrptgG epwji j cUthf;Fk; fhujjpy; nkjjpy; MuQR kQrs; epwji j cUthf;Fk;

epwq;fhl;b	mkpyjjpy; epwk;	fhujjpd; epwk;
ypl;k];	ePyk; - rptgG	rptgG – ePyk;
gpdhhjpyd;	epwkwwJ.	, sQrptgG
nkjjpy; MuQR	, sQrptgG	kQrs;

mkpyk; kw;Wk; fhuf; fi uryfspd; typ k:

pHmstL

- fi uri y> i ` lu[d; madpfspd; nrwptpd; mbggilapy; mstpLjNy pH mstL vdgglLk; pH , y; css pvdgJ n[hkd; nkhopapy; css 'nghl;|d;~' vdw thhjijiaf; FwpffpwJ. ,jd; nghUs; 'mjpf Mwwy;' vdgjhFk; pH mstlby; 0 Kjy; 14 tiu mstpLggLk; pH kjpgGfs> xU fi uryd; mkpyjjdik> fhujjdik myyJ eLepi yj;jdik Mfpatwiw milahsk; fhz cjTfpdwd.
  - mkpyj;jdik nfhz;l fi uryd;kjpgG 7 l tpl f; Fiwthf , Uf;Fk;
  - fhuj;jdik nfhz;l fi uryd;kjpgG 7 l tpl mjpfkhf , Uf;Fk;

  - eLepi yj;jdik nfhz;l fi uryd;kjpgG -f;Fr; rkkhf , UfFk;

cgGfs;

- cgG vdwhNy rhjhuz cgG cqfs; epidtpwF tuyhk; fly; ehpy; gy tifahd cgGfs; fiueJssd. mtwwpyUeJ Nrhbak; FNshi uL ghpj;nj Lfffg;gLfpwJ. ,t gy tifspy; gadgLfpdwd. mi djJ cgGfSk;
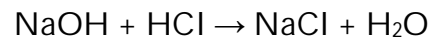
madpfSpd; NrhkkhFk; mkpyqfS fFk> fhuqfS fFkpi lNa epfOk; eLepi yahfFk; tpi dapd; %yk; fpi lfFk; tpis nghUsfNs cgGfshFk; ,i t ehpy; fi uj;J Neh; kwWk; vjph; madpfis cUthfFfpdwd.

$$mkpyk; + fhuk; \rightarrow cgG + eh;$$

cgGfspd; ti ffs;

rhjhuz cgGfs;

- Xh; mkpyk; kwWk; fhuk; , twwpd; KOi kahd eLepi yahffypd; NghJ rhjhuz cgG fpi lffwJ.

$$NaOH + HCl \rightarrow NaCl + H_2O$$

mkpy cgGfs;

- Xh; cNyhfkhdJ mkpyjjpYss i`lu[d; mZ ffspd; gFjpasi t ntspNawWtjhy; ,i t cUthfpdwd. gy fhuj;Jt mkpyjjij xU fhujjpdhy; gFjpasT eLepi yahfff ,i t ngwggLfpdwd.

$$NaOH + H_2SO_4 \rightarrow NaHSO_4 + H_2O$$
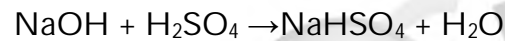
fhu cgGfs;

- ,i t ,U mkpyj;Jt myyJ %dW mkpyj;Jftf fhuqfspYss i`luhfirL madpi s Xh; mkpyjjhy; gFjpasT ntspNawr; nraJ ngwggLfpdwd.

$$Pb(OH)_2 + HCl \rightarrow Pb(OH)Cl + H_2O$$
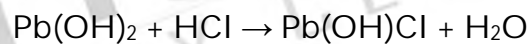
,ul; l cgGfs;

- rkkhd %yf$W vi ltpfj msTfspy; ,uz;L vspa cgGfspd; epi wTww fi uryfisr; Nrhj;J gbfkhfFk; NghJ ,ul; l cgGfs; cUthfpdwd. cjhuz khf> nghl;lh~; gbfhuk; vdgJ nghl;lhrpak; ryNgl; kwWk; mYkpdpak; ryNgl; fyej fyi tahFk;

$$KAl(SO_4)_2. 12 H_2O$$
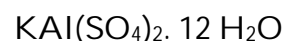
cgGfspd; gzGfs;

- cgGfs; ngUkghYk; jplgnghUsfshFk; mjpf ntggepi yapy; cUfTk> nfhjpffTk; nrafpdwd.

- ngUkghyhd cgGfs; ehpy; fi uahk; v.fh: Nrhbak; FNshi uL> nghl;lhrpak; FNshi uL. Mdhy; rpy;th; FNshi uL ehpy; fi uahhJ.

- epwkwwJ. ntzj; i kahdJ> fd rJu gbfk; myyJ gbfj; J}shf ,UfFk;

- ehl u cwpQRk; jdi kAi laJ.

gbf eh;

- gy cgGfs; eh; %yf;$WfSld; ,i zeJ gbfkhff; fhz ggLfpdwd. ,ej eh; %yf;$Wfs; gbf eh; vdggLk; gbf eh; uf; nfhz;L cgGfs; eNuww cgGfs; vdggLk; cgGld; ,i zeJ eNuwwk; nfhz;L eh; %yf;$Wfis Ntjp thgghlbwFg; gpd; xU Gssp itj;J mjd; msT Fwpggplggls; v.fh. fhggh; ryNgl; vdw cggpy; LeJ eh; %yf;$Wfs; cssd. mjid ,t;thW vOjyhk; CuSO$_4$.5H$_2$O ,jid fhggh; ryNgl; ngdb;hi ` lNul; vd mioffyhk; ,ej gbf eh; fhggh; ryNgl;il ely ewkhf khwWk; ,jid ntgggLj;Jk; NghJ eh; %yf;$Wfis ,oeJ ntz;ikahf khWk;

- gbf eh; mww cgGfs; eNuwwk; mww cgGfs; vdggLk; ,it J}shff; fhz ggLk;

cgG	eUww cggpd; thgghL	eNuwpa cgGfspd; thgghL	eNuwpa cgGfspd; ngah;
[pqf; ryNgl;	ZnSO$_4$	ZnSO$_4$. 7H$_2$O	
nkfdPipak; FNshi uL	MgCl$_2$		nkfdPipak; FNshi uL n` f;]hi` lNul;
,UkG IIryNgl;		FeSO$_4$. 7H$_2$O	,UkG II ryNgl; n` g;h i ` lNul;
fhypipak; FNshi uL	CaCl$_2$	CaCl$_2$.2H$_2$O	
Nrhbak; jNah ryNgl;	Na$_2$S$_2$O$_3$		Nrhbak; jNah ryNgl; ngd;h i ` lNul;

cgig milahsk; fhZ jy;

1. ,aw; Nrhji dfs; cgGfspd; epwk> kz k; kwWk; mlhjjp Mfpatwiw mwpjy; ,ej Nrhji d ekgfjjdik mwwJ.

2. cyh; ntgg Nrhji d: cyhej Nrhji df; Fohapy; rpwpsT cgig vLj;Jfnfhz L #LgLj;Tk; eh; Mtpahd gwF> fi uahj cgGfs; Nrhji df; Fohapd; mbapy; jqFk;

3. RIh; Nrhji d: rpy cgGfs; mlh; i ` lNuhFNshhpf; mkpyj;Jld; tpi dGhpeJ mtwpd; FNshi uLfis sj; jUfpdwd. mlh; i ` lNuhFNshhpf; mkpyj;Jld; fyej fyi t gpshlbdk; fkgapd; cjtpNahL RIhpy; fhl;lggLfpJ.

RIhpd; epwk;	fhz gi t
nrqfy; rptgG	Ca^{2+}
nghd;dpw kQrs;	Na^{2+}
,sQrptgG cjh	K$^+$
grpr	Zn^{2+}

4. i ` lNuh FNshhpf; mkpyjj> fhhgNdl; cgGSld; Nrhf;Fk; nghOJ> Ei u nghqFk; fhhgd; il MfirL thAi tj; jUfpwJ.

cgGfspd; gadfs;
rhjhuz cgG – Nrhbak; FNshi uL (NaCl)

- ,J eh; mdwhl cz tpYk> cz itg; ghJ fhggjpYk; gadgLfpwJ.

ryi t Nrhlh – Nrhbak; fhhgNdl; (Na$_2$Co$_3$)

1. ,J fbd eY u nkddYhf;fg; gadgLf;wJ.
2. ,J fz z hbj; njhopwrhi y> NrhgG kwWk; Ngggh; njhopwrhi yfsY; gadgLf;wJ.

ri kay; Nrhlh – Nrhbak;i g fhhgNdll; ($NaHCo_3$)

1. ,J nuhlbr; Nrhlh jahhpf;fg; gadgLf;wJ. nuhlbr; Nrhlh vdgJ ri kay; NrhlhTk> lhhlhhpf; mkpyKk> Nrhej; fyi tahFk;

2. ,J Nrhlh – mkpy jaiz gghdfspy; gadgLf;wJ.

3. Nff; kwWk; nuhlbfis nkdi kahf khwWfpwJ.

4. ,J mkpy efffapy; css xU gFjpgnghUs; ,ejf; fiury; fhujjdik ngwwpUggjhy; tapwwYss mjpfggbahd mkpyjijj eLepi yahfFfpwJ.

ryi tj;J}s; - fhyrpak; Mf;] pFNshi uL ($CaOCl_2$)

1. fpUkp ehrpdpahfg; gadgLf;wJ.
2. gUjjp kwWk; ypdd Jzpfis ntSffg; gadgLf;wJ.

ghhp] ; rhe;J – fhyrpak; ryNgl; n` kpi ` lNul; ($CaSo_4 . \frac{1}{2} H_2O$)

1. Kwpej vYkGfis xll i tggjwFg; gadgLf;wJ.
2. rpi yfS ffhd thhgGfi sr; nraag; gadgLf;wJ.

epi dtpy; nfhhs;f.

· ehpy; fi uAk; nghOJ H^+ madpfis Nah>H_3O^+madpfis Nah jUk; nghhUs;fi s mkpyqfs; vdf;pNwhk;

· ehpy; fi ue;J OH^-madpfis sj; jUgi t fhuqfs; vdggLf;pdwd.

· mkpyqfS ffFk> fhuqfS ffpi lNa epfOk; eLepi yahfFk; tpi dapd; %yk; fpi lf;Fk; tpi snghhUs;fNs cgGfshFk;

· ekJ mdwhl thofi fapYk> njhopwrhi yfspYk; cgG gyNtW tpjqfspy; gadgLf;wJ.

· mkpyqfs; kwWk; fhuqfs; ehpy; fi ue;J madpfi sj; jeJ kpdrhujij j flj;Jk;

· mkpyqfs; cNyhfqfSld; tpi dGhpe;J mtwpd; cgigAk> eYuAk; jUfpdwd.

· xU fi uury; mkpykhf> fhukh vd mwptjwF epwqfhl bfshd gpdhgjpYd; kwWk; nkjjp;y; MuQR gadgLjjggLfpdwd. ypk] ; jhSk; gadgLjjggLf;wJ.

· nfhLffggll Lss fi uury; mkpyjjdik thaejjh? myyJ fhujjdik thaejjh? vdf; fzlwpa pH jhs; gadgLjjggLf;wJ.

- ,uh[jµhtfk; vdgJ %dW gq;F i ` lÑuh FNshhµf; mkµyKk; xU gq;F i elhµf; mkµyKk; fyej fyi tahFk;

- pH mstL fi urypy; css i ` lµ[d; madµfspd; nrwµtµi df; fz Lgµbf;fg; gadgLfµwJ.

10thmw[ltpay;
myF 9
fi uryfs;

mw[Kfk;

- ehk; mdwhl tho;tpy; gadgLj;Jk; ngUkghyhd nghUl;fs; ,uz L myyJ mjwF Nkwgl;l nghUl;fspd; fyitahFk; fyitapy; fhz ggLk; nghUl;fs; xdW myyJ mjwF Nkwgl;l ,awgay; epi yfspy; fhz ggLfpdwd. vLj;Jf;fhl;lhf> ehk; kufflilia vhpFkNghJ mjpy Ue;J ntspNaWk; Gi fahdJ j l f; fhhgd> fhhgd; il Mfi] L> fhhgd; Nkhdhfi] L kwWk; rpy thAf;fisf; nfhz l fyi tahFk;

- xU rpy fyi tfspd; $Wfis vspjhf ghpf;fyhk; mNj rkak; xU rpy fyi tfspd; $Wfi s vspjhf ghpf ,aynJ. cgGk; eUk; fyej fyi ti aAk;> kz Yk; eUk; fyej fyi ti aAk; vLj;JfnfhsfsNthk; ,uz L fyi tfspYk; eUhdJ nghJthd $whf cssJ. Kjy fyi tapy; cgghdJ ehpy fi ufwJ ,uz lhtJ fyi tapy; kz yhdJ ehpy fi uatppi y. kz Yk; eUk; fyej fyi ti a tbflLj;y Ki wapd; %yk; ghpffyhk; Mdhy> cgGk; eUk; fyej fyi ti a mt;thW ghpff ,aynJ. VnddDpy> cgG> ehpy fi ueJ xU gbjjhd fi uri cUthfFfwJ. ,jjifa xUgbjjhd fyi ti a fi ury; vdfpNwhk;

mdwhl tho;tpy; fi uryfs;

- fly; elhdJ ,awi fahy; fhz ggLk; fi uryfspy; xdW flyeh> ,yyky; ,gGtpapy; ehk; tho;tij fwgid naJ$l ghhff ,aynJ. fly; eh gy cgGfs; fyej xU gbjjhd fyi tahFk; mNj Nghyy; fhwWk; xU fi uryhFk;

- fhwwhdJ i elu[d> Mf;] p[d> fhhgd; il Mfi] L kwWk; gy thAffs; fyej xUgbjjhd fyi tahFk;

- ,gGtpapy; thOk; mi dj;J caphdqfSk; fi uryfNshL njhlhhG nfhz li t. jhtuqfs; jqfSffFj; Njitahd Cl lrrj;Jfis kz zpyUeJ fi ury; epi yapNyNa vLj;Jfnfhsfpdwd. kdj clypy; css ,ujjk;> epz eh> rpNwh; Nghdw ngUkghdi kahdit fi uryfNs MFk; ek; mdwhl tho;tpy; Ji tjjy> ri kjjy> J}ai kggLjjy kwWk; gy nrayghLfs; eNuhL ,i zeJ fi uryfis cUthfFfwJ. mNj Nghy> ehk; mUeJk; gorrhW> fhwW epuggggl;l ghdqfs>Njeh> fhgp Nghdwit tfSk; fi uryfNs MFk; Mi fahy; kdj cld; mdwhl tho;tpy; epy y eNj;Jtjpy; fi uryfs; Kffpa ggF tfpffwJ. mNj Ntisapy; elhdJ khRgLtjwFk; ehpd; fi ufFk; gz Ng fhuz khfwJ. vggbahapDk; kdj cld; ,gGtpapy; cghtho fi uryfs; cjTfwJ. ,gghljjpy; fi uryfis gwwpa mw[lhi y fwf ,Uffwhk;

fi urypy; css $Wfs;

- "fi ury; vdgJ ,uz L myyJ mjwF Nkwgl;l nghUl;fisf; nfhz l xU gbjjhd fyi t" vdgij mw[Nthk; mjhtJ xU fi urypy; Fi wej msT (vil) nfhz l $W> fi unghUs; vdWk> mjpf msT (vil) nfhz l $W> fi ugghd; vdWk> mjpf msT (vil) nfhz l $W> fi ugghd; vdWk> mi of;fgggLfwJ. fi unghUshdJ fi ugghdpy; KOtJk; rhhf tpy;tp fi ueJ xUgbjjhd fi ur i y cUthfFfwJ. ,qF fi ugghd; MdJ fi ufFk;

Clfkhf nraygLf]wJ. "xU fi ugghd]py; fi unghUshdJ fi utij fi ujjy; vdf]Nwhk; xU fiury; cUthFk; t]jk; nfhLf]fgglLssJ.

- xU fiury; Fi wejgl]rk; ,uz]L $Wfisf; nfhz]bUf]Fk; (xU fi unghUs; kwWk; xU fi ugghd)

- xU fi unghUi sAk> xU fi ugghi dAk; nfhz]bUf]Fk; fi ury; , Ukbf]fiury; (, U $Wfs) vdggLk; cjhuz khf> fhggh ryNgl; gbf]qfis eh]py; fi uf]Fk; NghJ> mJ fi ue]J fhggh ryNgl; fi uri y cUthf]Ff]wJ. ,f]fi uryhdJ , U $Wfisf; nfhz]LssJ. mjhtJ> xU fi unghUs; - fhggh ryNgl; kwWk; xU fi ugghd; - eh; Mf]atwi wf; nfhz]LssJ. vdNt> , J , Ukbf]fi uryhFk; mNj Nghy; xU fi uryhdJ , uz]bwFk; Nkwgl]l $Wfisf; nfhz]bUf]fyhk; cjhuz khf cgi gAk> rh]ffi ui aAk; eh]py; fi uf]Fk; NghJ , it eh]py; fi ue]J xU fi uri y cUthf]Ff]wJ. ,j]py; xU fi ugghd]py; , U fi unghUl]fs; fi uf]fggl]Lssd. , f]fi ury; %dW $Wfisf; nfhz]bUggjhy; , J Kkkbf]fi ury; vdW mi of]fggLf]wJ.

fi ury;fs]pd; ti ffs;

fi unghUs; kwWk; fi ugghd]pd; , awg]ray; ep]yi ki a mbggi lahff; nfhz]l ti fgghL:

- nghUs;fs; nghJthf %dW , awg]ray; ep]yfs]py; (ep]yi k) fhz]ggLf]wJ. mi tfs;j]pz]k> j]ut]k; kwWk; thA. , Ukbf]fiury]py; c ss fi unghUs; kwWk; fi ugghd; f]b]f]fz]l VNj Dk; xU , awg]ray; ep]ya]py; fhz]ggLf]wJ.

- Mdhy; xU fi ury]py; fi ugghd]pd; gq]F ngUkghdi kahdJ. mjDi la , awg]ray; ep]i yahdJ> fi ury;fs]pd; gz]Gfi s j]h]khdggj]py; Kf]f]pa fhuz]pahf t]psq]Ff]wJ. gyNtW ti fahd , Ukbf]fi ury;fi s fhz yhk;

, Ukbf;fi ury;fs;pd; ti ffs;

fi unghUs;	fi ugghd;	c jhuz k;
j[z kf;fi ury;		
j[z kk;	j[z kk;	jqfjj;py; fi uf;fggl;l fhggh; (c Nyhfk; fyi tfs)
j[utk;	j[z kk;	ghjurj;Jld; fyej Nrhbak; (, urf;fyi tfs)
j[utf; fi ury;		
j[z kk;	j[utk;	eh;py; fi uf;fggl;l Nrhbak; FNshi uL fi ury;
j[utk;	j[utk;	eh;py; fi uf;fggl;l vjjpy; Myf`hy;
thA	j[utk;l	eh;py; fi uf;fggl;l fhhgd; il Mfi]L (Nrhlh eh;)
thAf;fi ury;		
j[utk;	thA	fhwwpy; c ss eluhtp (Nkfk)
thA	thA	Mf;]p[d; - `ypak; thAf;fyi t

fi ugghdpd; jd;i ki a mbggi lahff;nfhz;L ti fgghL:

• eh;py; ngUkghyhd nghUl;fs; fi ufwJ. vdNt eh; xU 'c yfshtpa fi ugghd' myyJ 'rh;tf;fi ugghd' vdW mi of;fgglLfwJ. , UggpDk; rpy nghUl;fs; eh; fi utjpyyi y. , twi wf; fi uf; <jhfs> ngdrhbd> Myf`hyfs; Nghdw fi ugghdfi sg; gadgLjjp fi uryfs; jahhff;gglLfwJ. fi ugghdpd; ti ffis mbggi lahff;nfhz;L fi uryfi s , uz;L ti ffshfg; ghpf;fyhk; mi tfshtd: eh;ffi ury; kwWk; eluww fi ury;

eh;f;fi ury;

• vej xU fi urypy> fi unghUis sf; fi uf;Fk; fi ugghdhf eh; nraygLfwNjh mf;fi ury; eh;f;fi ury; vdgglLk; nghJthf rfggpz zgG Nrhkq;fi s tpl madgpz zgGr; Nrhkq;fs; eh;py; vspjpy; fi ueJ eh;f;fi uri y cUthf;fwJ. c jhuz khf eh; fi uf;fggl;l rhf;fi u> eh; fi uf;fggl;l fhggh; ryNgl; Nghdwi tfshFk;

eluww fi ury;

• vej xU fi urypy; el uj; jtp> gpw j[utqfs; fi ugghdhf nraygLfwNjh mf;fi ury; eluww fi ury;vd mi of;fgglLk;. el uj; jtp gpw fi ugghdfi s eluww fi ugghdfs; vd mi of;fNwhk; nghJthf Myf`hyfs> ngdrbd<jhfs> fhggh; ilryi gL Nghdwi t eluww fi ugghdfshf gadgLjggLfwd. c jhuz khf fhggh; ilryi gby; fi uf;fggl;l rygh> fhggh; nlluh FNshi uby; fi uf;fggl;l mNahbd;

fi unghUspd; msi t mbggi lahff;nfhz;L ti fgghL:

• Fwpggpl;l #oepi yfspy> Fwpggpl;l msT fi ugghdpy; Fwpggpl;l msT fi unghUs; fi uf;wJ. fi ugghdpy; c ss fi unghUspd; msi tg; nghUj;J fi uryfi s fboffz;lthW ti fgggLjjyhk;

  1. nj tpl ba fi ury;
  2. nj tpl;lhj fi ury;
  3. mj;nj tpl ba fi ury;

1. nj tpll ba fi ury;

- xU Fwpgggpll ntggepi yapy; vej xU fi urypy; NkYk; fi unghUi s fi uff
  , ayhNjh> mffi ury; nj tplba fi ury; vdggLk; cjhuz khf 25°C
  ntggepi yapy; 100 fp ehpy> 36 fp Nrhbak; FNshi uL cggpi df; fi uj;J
  nj tplba fi ury; cUthffggLfpwJ. NkYk; fi unghUi sr; NrhfFk; NghJ
  mJ fi uahky; Kfi tapd; mbapy; jqfptplLfpwJ.

2. nj tpll;hj fi ury;

- xU Fwpgggpll ntggepi yapy> nj tplba fi urypy; fi ueJss fi unghUspd;
  msi t tplf; Fiwthd fi unghUs; msi tf; nfhz;l fi ury; nj tpll;hj
  fi ury; MFk; cjhuz khf 25°C ntggepi yapy; 100 fp ehpy> 10 fp myyyJ 20
  fp myyyJ 30 fp Nrhbak; FNshi uL cggpi df; fi uj;J nj tpll;hj fi ury;
  cUthffggLfpwJ.

3. mj mnj tplba fi ury;

- xU Fwpgggpll ntggepi yapy> nj tplba fi urypy; css fi unghUspd;
  msi tf; fhlbYk; mjpfkhd fi unghUi sf; nfhz;l fi ury; mj mnj tplba
  fi ury; vdggLk; cjhuz khf 25°C ntggepi yapy; 100 fp ehpy> 40 fp Nrhbak;
  FNshi uL cggpi d fi uj;J mj mnj tplba fi ury; cUthffggLfpwJ.
  ntggepi y> mOjjk; Nghdlw #oepi yfis khwWtjd; %yk; fi ujpwi d khww
  , aYk; mj mnj tplba fi uryhdJ epi yawwJ. fi ury; css Kfi ti ar;
  rpwpjsT mi rjjhYk; kLz Lk; gbfqfs; NjhdWfpwJ.

nrwpTkpff kwWk; ehjj fi uryfs;

- , J nj tpll;hj fi uryfspd; xU ti fgghlhFk; , tti fgghlL xNu msT
  fi ugghdlpy; nttNtW msT fi unghUi s nfhz;l , U fi uryfspd; xggpL
  nrwpi tf; Fwpffpwd. cjhuz khf> cdlpk k; , uz;L Ftisfs; Njehp
  nfhlLffggllLsssJ. , uz;L Ftis Njehp uAk; ep mUeJfpwha; mjpy; xdW
  kwnwhdi w tpl mjpf , dpgghf , Uggij czhfpwha; vdlpy> , jpypUeJ ep
  vdd mwpfpwha? vejf; Ftis Njehp> mjpfkhf , dpffpwNjh mJ kwnwhdi w
  tpl rhfffi u mjpfkhff; fyeJsssJ. vdgij mwptha; cdJ cwWNehffi y
  vt;thW ntspggLjJtha? rhfffi u mjpfkhf css NjehhdJ jplkhdJ vdW
  $WNthk; Mdhy> xU Ntjpapayhsh , ji dr; 'nrwpT kpFejJ' vdW $Wth;

- xNu khjphpahd fi unghUi sAk> fi ugghi dAk; nfhz;l , U fi uryfis
  xggpLk; NghJ> vjpy; mjpf msT fi unghUs; cssNjh (Fwpgggpll msT
  fi ugghdlpy;) mjpd nrwpTkpff fi ury; vdWk> vjpy; Fiwej msT
  fi unghUs; cssNjh mjpd ehjj fi ury; vdWk; $wyhk;

- fi uryfis> ehjj kwWk; nrwpTkpff fi uryfs; vd NtWgLjJtJ xU gz G
  rhhhej Fwpall hFk; , J fi urypy; fi ueJss fi unghUspd; Jyyyakhd
  msi tf; Fwpggpy;y. , ej NtWghlhdJ epwk> mlhjjpp Nghdlw , awgpay;
  gz Gfs; %yk; mwpaggLfpdwd.

fi uj pwd;

- xU Fwpgggpll ntggepi yapy> Fwpgggpll msT fi ugghdlpy; fi uaf$ba
  fi unghUspd; mstpwF Xh; vyi y czL (Fwpgggpll msNt fi uAk;). , ej
  vyi yia mi lak; NghJ nj tplba fi ury; cUthfpwJ. NkYk; $Ljyhf
  Nrhffggllk; fi unghUshdJ fi uahky; fi urypd; mbapy; jqfptplLfpwJ. xU

fi ugghdypy; fi uaf; $ba fi unghUspd; msi t fi ujpwd; vdw gz gpdhy; tpsff KbAk; fi ujpwd; vdgJ vt;tsT fi unghUs; Fwpgggpll msT fi ugghdypy; fi uAk; vdgjwfhd msthhFk;

· xU Fwpgggpll ntggepiy kwWk; mOjjjjpy; 100 fp fi ugghdypy; fi ue;J njtplba fi uriy cUthff Nji tahd fi unghUspd; fpuhkfspd; vz z pfi f mjd; fi ujpwd; vdggLk; cjhuz khf 25°C y; 100 fp ehpy; 36 fp Nrhbak; FNshi uL fi ue;J njtplba fi uriy cUthfFfpwJ.

fi ujpwd; vdgij gpd;tUk; rkdghli l nfhz L fz ffpl yhkl;

$$fi ujpwd; = \frac{fi unghUspd; epi w}{fi ug;ghdpd; epi w} \times 100$$

25°C y; 100 fp ehpy; gyNtW fi unghUs;fspd; fi ujpwd; nfhLf;fgglILssJ.

ngah;	thagghL	ehpy;
fhyrppak; fhhgNdl;	$CaCO_{(jpz kk)}$	00013
Nrhbak; FNshi uL	$NaCl_{(jpz kk)}$	36
mkNkhdpah	$NH_{(jpz kk)}$	48
Nrhbak; i `lphfi]L	$NaOH_{(jpz kk)}$	80
FSfNfh];	$C_6H_2O_{(jpz kk)}$	91
Nrhbak; GNuhi kL	$NaBr_{(jpz kk)}$	95
Nrhbak; mNahi lL	$NaI_{(jpz kk)}$	184

fi ujpwid ghjpf;Fk; fhuzpgfs;

· xU fi unghUspd; fi ujpwid %dW Kffpa fhuzpgfs; jhkhdpf;fpdwd. mi tfshtd.

1. fi unghUs; kwWk; fi ugghdpd; jdik
2. ntggepiy
3. mOjjk;

fi unghUs; kwWk; fi ugghdpd; jdik:

· fi ujpwdpy> fi ugghd; kwWk; fi unghUspd; jdik Kffpa gq;F tfpffpwJ. eh; ngUkghdikahd nghUl;fis fi ufFk; jdik a nfhz bUejhYk> rpy nghUs;fs; ehpy; fi utjpyiy. ,jidNa Ntjpaypayhshfs; fi ujpwid gwwpf FwpggLk; NghJ 'xjj fi unghUl;fs; xjj fi ugghdpy; fi ufpwJ"(Like dissolves like) vdfpwdh; fi unghUS fFk; fi ugghDfFk; ,ilNa xwWik fhz ggLk; NghJ jhd; fi ury; epfofpwJ. cjhuz khf> ri kay; cgG Ki dTWk;Nrhkk;vdNt ,J KidTWk; fi ugghdhd ehpy; vspjpy; fi ufpwJ.

· mJNghyNt KidTwr; Nrhkqfs; KidTwh fi ugghdpy; vspjpy; fi ufpwJ. cjhuz khf>jhpy; fi ufFggll nfhOgG> Mdhy> KidTwr; Nrhkqfs; KidTWk; fi ugghdpy; fi utjpyiy. mJNghy KidTWk; Nrhkqfs; KidTwh fi ugghdpy; fi utjpyiy.

ntggepiy:

1. jputjjpy; jpz kqfspd; fi ujpwd;

nghJ thf ntggepi y mjpfhpfFk; NghJ ehk fi ugghdpy; jpz kg; nghUspd;
fi ujpwd; mjpfhpffpwJ. cjhuz khf> Fsphej ehpy; fi utij tpl rhffiu u>
RLehpy; mjpf mstpy; fi ufpwJ.

ntggfnfhs; nrayKi wapy> ntggepi y mjpfhpfFk; NghJ fi ujpwd;
mjpfhpffpwJ. ntgg ckp> nrayKi wapy> ntggepi y mjpfhpfFk; NghJ
fi ujpwd; Fi wfpwJ.

2. **jputjjpy; thAffspd; fi ujpwd;**
ehu ntgggggLj;Jk; NghJ Fkppfs; tUfpdwd. Vd? jputjjpd;
ntggepi yia mjpfhpfFk; NghJ thAtpd; fi ujpwd; Fi wfpwJ. Mi fahy;
Mf;]pld; Fkppfshf ntspNaWfpwJ.

· ehtho; camhdqfs; Fsph guNjrqfspy; mjpfkhf thofpdwd. Fsph
guNjrqfspy; css ehepiyfspy; mjpf mstp Mf;]pld; fiueJssJ.
Vndddpy> ntggepi y Fi wAk; NghJ Mf;]pldpd; fi ujpwd; mjpfhpffpwJ.

mOjjk;

· thAffis fi unghUshf nfhz;l jput fi uryfspy; klLNk mOjjjpd;
tpi sT Fwgggljjffjhf ,Uf;Fk; mOjjjij mjpfhpfFk; NghJ xU
jputjjpy; thAtpd; fi ujpwd; mjpfhpffpwJ.

· thAffis fi unghUshf nfhz;l jput fi uryfSfF rpy; vLjJffhl;Lfs;
Fsphghdqfs> tpL cgNahf mkNkhdpah> ghhkypd; Nghdwi tfs;

fi urypd; nrwpT:

· fi ury; vdwhy; vdd vdgijAk> fi urpypy; css $Wfs; kwWk; mjd;
ti ffisAk; tpthjp Njhk; ngUkghyhd Ntjpptpi dfs; fi ury; epi yapNyNa
epfofpdwd. vdNt> mjjifa fi uryfspy; fi ugghdpy; fiueJss
fi unghUspd; rhpahd msit mwpeJ nfhstjd; %yk; mjpy; epfFk;
tpi sTfis edF Muha ,aYk; fi urypy; css fi unghUspd; rhpahd
mstpid Fwgggwf ehk; nrwpT vdw gjjij gadgLj;JfpNwhk;

fi urypd; nrwpT vdgJ "nfhLffggl;l fi urypy; myyJ fi ugghdpy; fiueJss
fi unghUspd; msT" vd ti uaWffggLfpwJ.

· fi urypd; nrwptpid mstpl gyNtW Ki wfs; cssd. ehk; ,qF epi w
rj;Jk; kwWk; fd msT rjJk; Mfpatwi w gadgLjjp xU fi urypd;
nrwptpid vt;thW fz ffplyhk; vdgij fhz Nghk;.

epi w rj;Jk;

· epi w rj;Jk; vdgJ xU fi urypy; css fi unghUspd; epi wia rj;Jjjpy;
Fwpjjhy; mJ mffi urypd; epi w rj;Jk; vdggLk; ,J jpz k
fi unghUisAk> jput; fi ugghidAk; nfhz;l fi urypd; nrwpi t Fwpff
gadgLfpwJ.

$$epi \ w \ rj;Jk; = \frac{fi \ unghUspd; \ epi \ w}{fi \ urypd; \ epi \ w} \times 100$$

$$epi \ w \ rj;Jk; = \frac{fi \ unghUspd; \ epi \ w}{(fi \ unghUspd; \ epi \ w + fi \ ug;ghdpd; \ epi \ w)} \times 100$$

- cjhuz khf. 5% rh;ffiuf; fiury; vdgJ 5 fp rh;ffiui a> 95 fp ehpy; fiuj;J fpilf;Fk; fiury; MFk;. fiurypd; nkhjj epiw 100 fp MFk;.

- toffkhf epiw rjtJk; vdgJ w/w vd FwpffggnLfpwJ. ,J ntggepi yiar; rhhejJ myy.

fd msT rj tJk; :

- fd msT rj tJk; vdgJ xU fiurypy; css fiunghUspd; fd msit rjtJjjpy; Fwpjjhy; mJ mffiurypd; fdmsT rj tJk; vd tiuaWfggnLfpwJ. ,J jutf; fiunghUs; kwWk; jutf; fiugghi df; nfhz; l fiury;fspd; nrwpitf; Fwpff gadgLfpwJ.

$$fd\ msT\ rj\ tJk = \frac{fi\ unghUspd;\ fd\ msT}{fi\ urypd;\ fd\ msT} \times 100$$

$$fd\ msT\ rj\ tJk = \frac{fi\ unghUspd;\ fd\ msT}{(fi\ unghUspd;\ fd\ msT + fi\ ug;ghdpd;\ fdmsT)} \times 100$$

- cjhuz khf>10% fd msT vjjdhy; ehffiury; vdgJ 10 kpyp vjjdhiy 90 kpyp ehpy; fiuj;J ngwggLk; fiuri y Fwpffpwj.

- nghJthf fd msT rjtJk; vdgJ v/v vd FwpffggpnLfpwJ. fd msT rj tJk; ntggepi y mjprhpffpLk; NghJ Fiwfpwj. Vnddpy> jutqfs; ntggjjhy; tpptiLAk;.

- mdwhl tho;tpy; ehk; gadgLjjf;$ba jut kUejfs>(Syrup), thafOTk; jutqfs; (Mouth wash), Giuj; jLgghdfs; (Antiseptic), tl;L cgNahfg; nghUl;fs> fpUkpehrpdpfs; Nghdw fiuryfspy; css fiunghUspd; msTfs; v/v vdw gjjhy; Fwpggl ggLfpwJ. mNj Nghy; fspkGfs; (Ointment) mkpyeffpfs> NrhgGfs; Nghdwtwwpy; css fiurypd; nrwpTfs; w/w vdW Fwpggl ggLfpwJ.

eNuwpa cgGfs; kwWk; gbfkhffy; eh;

- madpr; Nrhqfis ehpy; fiuj;J njtpba fiuri y cUthfFk; NghJ> mtwpd; madpfs; eh; %yf;$Wfisf; fthejJ> Fwpggpl Ntjp tpfpjjjpy; gpizggpd d Vwgfjjpf; nfhs;fpdwd. ,eepfo;T eNuwwk; vdggLk; ,ej madpr; Nrhkqfs; mtwpd; njtpba fiurypy; ,Uej Fwpggpl vz z pfi fapyhd eh; %yf;$WfSld; NrheJ gbfkhwpwJ. ,ejg; gbfqfSld; fhz ggLk> eh; %yf;$Wfspd vz z pfi fNa gbfkhffy; eh; vdggLk; mjjifa gbfqfs; eNuwpa cgGfs; vdggLk;.

- ,ggbf cgGfis ntggggLj;Jk; NghJ> mit gbfkhffy; ehu ,oe;J gbf cUtwwjhf khWpdwd kwWk; epwjij ,offpdwd (mit epwKss cgGfshf ,Uejhy) rpy nghJthd eNuwpa cgGfs; nfhLffggl;LssJ.

nghJg; ngah;	IUPAC ngah;	%yf;$W thagghL
eBy tplhpahy; (kapy; Jjjk)	fhggh; (II) ryNgl; ngldhi ` lNul;	$CuSO_4.5H_2O$
vgrk; cgG	nkfdrpak; ryNgl; n` gl hi ` lNul;	$MgSO_4.\ 7H_2O$
[grk;	fhyrpak; ryNgl;	$CaSO_4.\ 2H_2O$

	i l i ` lNul;	
grii r tpilhpahy;	, UkG (II) ryNgl; n` gl hi ` lNul;	$FeSO_4 . 7H_2O$
ntsi s tpilhpahy;	rpq; n` gl hi ` lNul;	$ZnSO_4 . 7H_2O$

fhggh; ryNgl; ngdlhi ` lNul; $CuSO_4 . 5H_2O$ (eNy tpilhpahy; myyJ kapy;Jjjk)

- eNy tpilhpahy; cggpy; leJ eh; %yf;$Wfs; cssd. ,jd; gbfkhffy; eh; %yf;$Wfspd; vz zpfif leJ> eNyepw fhggh; ryNgl; ngdlhi ` lNul; gbfjij nkJthf ntggggLj;Jk; NghJ> leJ eh; %yf;$Wfis ,oeJ epwkww> eNuww fhggh; Mf khWfpwJ.

வெப்பப்படுத்துதல்
$$CuSO_4 \cdot 5H_2O \rightleftharpoons CuSO_4 + 5H_2O$$
குளிர்வித்தல்

(காப்பர் சல்பேட்
பென்டாஹைட்ரேட்)   (நீரற்ற காப்பர்
சல்பேட் + நீர்)

- epwkww> eNuww fhggh; ryNgl; cggpy; rpy Jsp ehpi dr; Nrhf;Fk; NghJ myyJ Fspht;tp;Fk; NghJ cgghdJ kIzLk; eNy ew eNuwpa cgghf khWfpwJ.

வெப்பப்படுத்துதல்
$$MgSO_4 \cdot 7H_2O \rightleftharpoons MgSO_4 + 7H_2O$$
குளிர்வித்தல்

(மெக்னீசியம் சல்பேட்
ஹெப்டாஹைட்ரேட்)   (நீரற்ற
மெக்னீசியம்
சல்பேட் + நீர்)

nkfdlhpak; ryNgl; n` gl hi ` lNul; $MgSO_4 . H_2O$ (vgrk; cgG):

- vgrk; cggpd; gbfkhffy; eh; %yf;$Wfspd; vz zpfif VO. nkfdlhpak; ryNgl; n` glhi ` lNul; gbfjij nkJthf ntggggLj;Jk; NghJ VO eh; %yf;$Wfi s ,oeJ epwww nkfdlhpak; ryNgl;hf khWfpwJ.

வெப்பப்படுத்துதல்
$$MgSO_4 \cdot 7H_2O \rightleftharpoons MgSO_4 + 7H_2O$$
குளிர்வித்தல்

(மெக்னீசியம் சல்பேட்
ஹெப்டாஹைட்ரேட்)   (நீரற்ற
மெக்னீசியம்
சல்பேட் + நீர்)

- eNuww nkfdlhpak; ryNglby; rpy Jsp eh ur; Nrhf;Fk; nghOJ myyJ Fspht;tp;Fk; NghJ cgghdJ kIzLk; eNuwpa cgghf khWfpwJ.

<uk; cwpQRj y;

- rpy Nrhkqfs; rhjhuz ntggepiyapy;> tspkz;lyf; fhwWl d; njhlh; G nfhsSk; NghJ mjpYss <uj;j cwpQRk; jdikiag; ngwWssd.

, eepfo;tpd; NghJ mtwwpd; , awgpay; epi y khWtjpyi y. , jj i fa Nrhkqpfs; <uk; cwpQRk; Nrhkqpfs; myYJ <uk; ftUk; Nrhkqpfs; vdggLfpdwd. , ggz gpwF <uk; cwpQRj y vdW ngah;

· <uk; cwpQRk; Nrhkqpfs; cyhj;Jk; nghUshf gadgLjjggLfpdwd.
cjhuz qpfs;

1. ml h; rygpAhppf; mkppyk; (H_2SO_4)
2. gh]gu] ; ngz;lhfi]L (P_2O_5)
3. RI;l Rz z hkG (CaO)
4. rpypppfh n[y; (SiO_2)
5. eLuww fhyrpak; FNshi uL $(CaCl_2)$

<uk; cwpQRppf; fi uj y;

· rpy Nrhkqpfs; rhjhuz ntggepi yapy> tspkz ;l yf; fhwWld; njhlhpG nfhsSk; NghJ mjpYss <ujij cwpQRp KOtJk; fiufpdwd. mjjpfa Nrhkqpfs; <uk; cwpQRppf; fi uAk; Nrhkqpfs; vdggLk; , ggz gpwF <uk; cwpQRppf; fi uj y vdWk; ngah;

· <uk; cwpQRppf; fi uAk; Nrhkqpfs; mtwwpd; gbfg gzi g , offpdwd. mit> KOikahf fiueJ njtplbaf; fiuriy cUthfFfpdwd. <uk; cwpQRppf; fi uj y mjpfkhf epfOk; , UfFk; #oepi yfs;
1. Fi wej ntggepi y
2. mjppf tspkz ;l y <uggjk;

· cjhuz hkf> fhyrpak; FNshi uL $(CaCl_2)$, Nrhbak; i ` luhfi ]L $(NaOH)$, nghl;lhrpak; i ` luhfi]L (KOH), kwWk; /nghhpf; FNshi uL $(FeCl_3)$.

<uk; cwpQRk; Nrhkqpfs;	<uk; cwpQRppf; fi uAk; Nrhkqpfs;
rhjhuz ntggepi yapy> tspkz ;l yf; fhwWld; njhlhpG nfhsSk; NghJ mjpYss <ujij cwpQRfpwJ. Mdhy; fi utjppyi y	rhjhuz ntggepi yapy> tz;kz ;l yf; fhwWld; njhlhpG nfhsSk; NghJ mjpYss <ujij cwpQRppf; fiufpwJ.
tspkz ;l yf; fhwWld; njhlhpG nfhsSk; NghJ jd;Di l a , awgpay; epi yia , oggjppyi y	tspkz ;l yf; fhwWld; njhlhpG nfhsSk; NghJ jd;Di l a , awgpay; epi yia , offpwJ.
, it gbf jpz kqpfshf kl;LNk fhz ggLfpdwd.	gbf cUtww jpz kqpfshfNth> jputqpfshfNth fhz ggLfpdwd.

fi ujpwd; epi w rj tpj kwWk; fdmsT rj tpj fz fFfs;

1. fi ujppwid mbggi l ahff; nfhz ;l fz fFfs;

1. 298 K ntggepi yapy 15 fp ehppy> 1.5 fp fi unghUi s fi uj;J xU njtplba fi ury; jahhpffggLfpwJ. mNj ntgg epi yapy; fi ugghdpd; fi ujppwd;f fz ;lwpf.

jh;T:

fi ugghdpd; epi w = 15 fp
fi unghUspd; epi w = 1.5 fp

$$\text{fi unghUspd; fi ujpwd;} = \frac{\text{fi unghUspd; epi w}}{\text{fi ugghdpd; epi w}} \times 100$$

$$fi\ unghUspd;\ fi\ uj\ pwd; = \frac{15}{1.5} \times 100$$

$$= 10\ fp$$

2. 303 K ntggepi yapy; 60 fp ehpy; vt;tsT epi wAss nghl;lhrpak; FNshi uL fiue;J njtplba fiuri y cUthfFk? mNj ntggepi yapy; nghl;lhrpak; FNshi ubd; fi uj pwd; 37/100 vdf; nfhLf;fggl;LssJ.

jh;T:

100 fp ehpy; fiue;J njtplba fiuri y cUthffj; Nji tahd nghl;lhrpak; FNshi ubd; epi w = 37 fp

60 fpehpy; fiue;J njtplba fiuri y

$$cUthffj; Nji tggLk; = \frac{37}{100} \times 60$$

nghl;lhrpak; FNshi ubdepi w

$$= 22.2\ fp$$

3. 30ºC ntggepi yapy; 50 fp ehpy; fiue;J njtplba fiuri y cUthffj; Nji tahd Nrhbak; FNshi ubd; epi w vdd? 30ºC ntggepi yapy; Nrhabk; FNshi ubd; fi uj pwd; 36 fp.

jh;T:

30ºC ntggepi yapy > 100 fp ehpy; fi uAk; Nrhbak; FNshi uL = 36 fp
100 fp ehpy; njtplba fiuri y cUthffj; Nji tahd Nrhbak; FNshi ubd; epi w = 26 fp

50 fp ehpy; njtplba fiuri y cUthffj;

Nji tggLk; Nrhbak;

$$= \frac{36 \times 50}{100}$$

FNshi ubd; epi w

$$= 18\ fp$$

4. 50ºC kwWk; 30ºC ntggepi yapy; Nrhbak; i elNulbd; fi uj pwd; Ki wNa 114 fp kwWk; 96 fp. 50 fp ehpy; cUthd njtplbaf; fiuri y 50ºC y; , Ue;J 30ºC ntggepi yf;F Fsp&l;Lk; NghJ fiurypy; , Ue;J ntspNawwggLk; myyJ tbgbthFk; Nrhbak; i elNul; cggpd; epi wi af; fhz;f.

jh;T

50ºC ntggepi yapy; 100 fp ehpy; fi uAk; Nrhbak; i elNulbd; epi w 114 fp.

50ºC ntggepi yapy; 50 fp ehpy; fi uAk; Nrhbak;

$$i\ elNulbd;\ epi\ w\ = = \frac{114 \times 50}{100}$$

57 fp

mNj Nghy; ntggepi yapy; 50 fp ehpy; fi uAk; Nrhbak;

$$i\ elNulbd;\ epi\ w\ = = \frac{96 \times 50}{100}$$

$$= 48\ fp$$

50°C y; , UeJ 30°C ntggepi yf;F Fsp&l;Lk; NghJ 50 fp el; uf; nfhz ;L cUthd njtplba fi urypy; , UeJ ntspNawWggLk; myyJ tbgbthFk; Nrhbak; i el;Nullbd; epi w = 57 – 48 = 9 fp

ii. epi w rj tJ j; i j mbggi l ahff; nfhz ;l fz f;Ffs;

1. 100 fp ehpy; 25 fp rhf;fi ui af; fi uj;J xU fi ury; j ahhpf;fggLf;wJ. mj d; fi unghUspd; epi w rj tJ ji j f; fhz ;f.

jh;T:

$$fi \ unghUspd; \ epi \ w = 25 \ fp$$
$$fi \ uggholpd; \ epi \ w = 100 \ fp$$

$$epi \ w \ rj \ tJ \ k; == \frac{fi \ unghUspd; \ epi \ w}{fi \ urypd; \ epi \ w} \times 100$$

$$epi \ w \ rj \ tJ \ k; == \frac{fi \ unghUspd; \ epi \ w}{(fi \ unghUspd; \ epi \ w + fi \ ug;gholpd; \ epi \ w)} \times 100$$

$$= \frac{25}{25+100} \times 100$$
$$= \frac{25}{125} \times 100$$
$$= 20\%$$

2. 25°C ntggepi yapy; 100 fp ehpy;> 16 fp Nrhbak; i ` luhfi]L fi uf;fggLf;wJ. fi unghUs; kwWk; fi uggholpd; epi w rj tJ ji j f; fhz ;f.

jh;T:

$$fi \ unghUspd; \ epi \ w \ (NaOH) = 16 \ fp$$
$$fi \ uggholpd; \ epi \ w \ (H_2O) = 100 \ fp$$

fi unghUspd; epi w rj tJ k;

$$epi \ w \ rj \ tJ \ k; = \frac{fi \ unghUspd; \ epi \ w}{(fi \ unghUspd; \ epi \ w + fi \ ug;gholpd; \ epi \ w)} \times 100$$

$$= \frac{16 \times 100}{16+100}$$
$$= \frac{1600}{116}$$

fi unghUspd; epi w rj tJ k; = 13.79%

fi uggholpd; epi w rj tJ k; = 100 – (fi unghUspd; epi w rj tJ k;)
$$= 100 – 13.79$$
$$= 86.21\%$$

3. 500 fp fi urypy; 10% (w/w): Ahpah ehf; fi uri yg; ngwj; Njita tahd Ahpahtpd; epi wi a fz f;fpLf.

jh;T

$$\text{ep}i\ w\ rj\ t\text{ℶ}k; = \frac{\text{fi unghUs}\text{ℓd; ep}i\ w}{\text{fi ury}\text{ℓd; ep}i\ w} \times 100$$

$$10 = \frac{\text{யூரியாவின் நிறை}}{500} \times 100$$

$$\text{A}\text{lꞔah t}\text{ℓd; ep}i\ w = \frac{10 \times 500}{100}$$

Nji tahd A\text{lꞔah t}\text{ℓd; ep}i\ w = 50 fℓ

iii. fd msT rj t\text{ℶ}j;j mbggi lahff;nfhz;l fz f\text{ꞔ}Ffs;

1. 35 kℓyℓ nkjjdhy; 65 kℓyℓ eℓUld; Nrhf\text{ꞔ}ffgglL xU fi ury; jahhℓf\text{ꞔ}fggLfℓwJ. fi uryℓd; fd msT rj t\text{ℶ}j;i j f;fhz;f.

    nkjjdhyℓd; fd msT = 35 kℓyℓ
            ehℓd; fd msT = 65 kℓyℓ

$$\text{fd msT rj t}\text{ℶ}k; = \frac{\text{fi unghUs}\text{ℓd; fd msT}}{\text{fi ury}\text{ℓd; fd msT}} \times 100$$

$$\text{fd msT rj t}\text{ℶ}k; = \frac{\text{fi unghUs}\text{ℓd; fd msT}}{(\text{fi unghUs}\text{ℓd; fd msT} + \text{fi ug;ghd}\text{ℓd; fdmsT})} \times 100$$

$$\text{fd msT rj t}\text{ℶ}k; = \frac{35}{35+65} \times 100$$

$$\text{fd msT rj t}\text{ℶ}k; = \frac{35}{100} \times 100$$

$$= 35\%$$

2. 200 kℓyℓ 20% (v/v) vjjdhy; - ehℓffi uryℓy; css vjjdhyℓd; fd msi tf; fz f\text{ꞔ}Lf.

    jℶT:

    vjjdhy; ehℓffi uryℓd; fd msT = 200 kℓyℓ
            fd msT rj t\text{ℶ}k; = 20%

$$\text{fd msT rj t}\text{ℶ}k; = \frac{\text{fi unghUs}\text{ℓd; fd msT}}{\text{fi ury}\text{ℓd; fd msT}} \times 100$$

$$20 = \frac{\text{vj;j dhy}\text{ℓd; fdmsT}}{200} \times 100$$

$$\text{vjjdhy}\text{ℓd; fd msT} = \frac{20 \times 200}{100} = 40\ kℓyℓ$$

Ntjptpi dfspd; ti ffs;

mwpKfk;

ebgfs; VwfdNt fwwwpejJ Nghy; xU Ntjptpi dapy; gioa gpiz gGfs; cilej Gjpa Ntjpggpiz gGfs; cUthfpdwd. ,J jddpri rahfNth myyJ ntspgGw Mwwy; myyJ ceJjy; %ykhfNth eiIngwyhk; Ntjpapay; vdgJ KOtJk; Ntjptpi dfiis gwwpajhFk; cqfSila mdwhl thotpy; gyNtW Ntjptpi dfis fhz ,aYk; kdj ,dk; kwWk; RwWr#oy; eyd; NgZjy; nghUIIL> ,jjifa tpi dfs; gwwpa njspthd Ghpjy; ,dwpai kahjJ. vdNt Ntjpapay; Ntjptpi dfis Kjdi kahf tpsf;Ffpwd.

eh; myyJ fhwWld; njhhlG nfhsSk; nghOJ ,UkG vdJUggbf;fpwJ?

ebgfs; czZk; czT nrhpkhdk; miltjd; %yk; Mwwiyg; ngWfpwhfs; jhtuqfs; GkpapypUe;J CIIrrj;Jffis cwpQrp tshffpdwd. NkYk; xspprNrhfi fapd; %yk; czi t ngWfpdwd. vhpnghUs; vhptjhy; fhh ,aqFfpwJ. ,UkG Mfrp[Ndwwkiltjhy; JUggbf;fpwJ. vdNt ,tti djJr; nrayfSk; Ntjp khwwqfshFk; mjhtJ khwwjjpwF clgLk; nghUsfs; midj;Jk; NtW Gjpa nghUsfshf khwwggLfpdwd. vLj;Jffhl;L: nglNuhy; vhpAkNghJ mjpy; mlqfpAss i`INuhfhhgdfs;> fhhgd; il Mfirrl; kwWk; ebhf khwwggLfpdwd. ,gghljjpy; Ntjp tpi dfspd; jdik kwWk; ti ffis tpthjpgNghk;

xU Ntjptpi d eiIngWk; nghOJ epfo;tnj dd?

· xU Ntjptpi dapy; <LgLk; %yf$Wfspd; mZffs; myyJ jdpkqfskhwwpai kffgglIL Gjpa %yf$Wfs; cUthfpdwd.
· mZ ffSffpi INaahd gpiz gGfs; cileJ Gjpa Ntjpggpiz gGfs; cUthfpdwd.
· gpiz gG cilAk; nghOJ Mwwy; cwpQrggLfpwJ. mNjNghdW gpiz gG cUthFk; NghJ Mwwy; ntspggLfpwJ (ckpoggLfpwJ)

Ntjptpi dfs; vt;thW Fwpffggldwd?

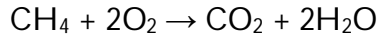kjNjd; Mfrp[DId; tpi dGhpeJ fhhgd; il Mfi rL kwWk; eh uj; jUfpwJ. ,t-tpi di a vt;thW FwpggpLthh? ,ttpi dapid thhjijj; rkdghilhf fbffz;lthW Fwpffyhk;
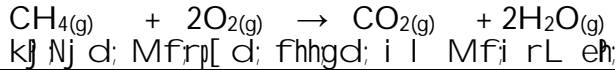
kjNjd; + Mfrp[d; → fhhgd; il Mfi rL + eh;

,rrkdghilhdJ tpi dgLnghUs;> tpi d tpi snghUsfspd Ntjp ,iaigj jUtjpyiy. vdNt xU Ntjptpi dapd; gzGfis gwwp mwpa mJ Ntjpr; rkdghilhf FwpffggLfpwJ. xU Ntjptpi dapy; <LgLk; Ntjpgnghus;fs; mtwwpd; Ntjpthaghlifshy; Fwpffggldwd. tpi dapy; <LgLk; jdpkqfs; myyJ Nrhkqfs; (tpi dgL nghUs;fs;)> mkGf;Fwpapd; ,IJGwKk;> tpi dapy; cUthFk; nghUs;fs; (tpi dtpi s nghUs;fs) mkGf;Fwpapd; tygGwKk; FwpffggLfpdwd. mkGf;Fwpahd J tpi d epFOk; jpi ri af; Fwpffpwd. ,tthwhf Nkw$wpa tpi di a gpd;tUkhW vOjyhk;

$$CH_4 + O_2 \rightarrow CO_2 + H_2O$$
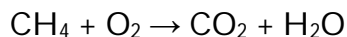
Mdhy; ,JTk; $I KOikaww Ntjpr; rkdghihFk; Vndddpy; nghUz;ik mopahtpjjpggb nghUz;iki a MffNth moffNth KbahJ. xU Ntjp tpi dapd; %yk; Gjpa mZ ffi s ehk; cUthff ,ayhJ. khwhf Ntjp tpi d %yk; gyNtW topfspy; mZ ffi s khwwaikkjJ Gjpa Nrhkjjpi d cUthffyhk; vdNt xU Ntjpr; rkdghiby; tpi dgL nghUs;fspd mZ ffspd; vz z pfi fAk> tpi d tpi s nghUs;fspYss mZ ffspd; vz z pfi fAk; rkkhf ,Uff Ntz;Lk; Nkwfz;l rkdghiby; i`Iu[d; kwWk; Mfrp[d; mZ ffspd; vz z pfi f rkkhf ,yiy. ,jid rhp nra;ANknghOJ fbffz;l rkdgLjjggl rkdghL tpi lffpwJ.
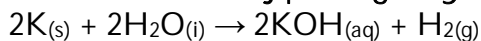
$$CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$$

NkYk; xU Ntjpr; rkdghlhdJ mt;tpidapy; <LgLk; nghUs;fspy;
,ayepi yi aAk> tpi dei lngWk; #oepi yfi sg; gwwpa tptujijAk; jUfpwJ.

$$CH_{4(g)} + 2O_{2(g)} \rightarrow CO_{2(g)} + 2H_2O_{(g)}$$

kjNjd; Mfrp[d; fhhgd; il MfirL eh;

> "rkdgLjjggl;l Ntjpr; rkdghL vdgJ xU Ntjptpi dapd; Ntjp , iaG> tpi dgL
> kwWk; tpi d tpi snghUs;fspd; ,awgpay; epi yi k kwWk; tpi d ei lngWk;
> #oepi yfi s Fwpf;Fk; vspa (FwpgG) Fwpal;lhFk;

> xU Ntjptpi dapy; <LgLk; nghUs;fspd; epi y kwWk; ,awgpay; epi yi a xU
> mi lgGfFwpf;Fs; RUff; Fwpal;fisg; gadgLjjp Fwpggpl yhk; vLjjf;fhl;lhf>
> jpz k nghl;lhrpak> eULd; tpi d GheJ nghl;lhrpak> i` luhfirilAk>
> i` lu[d; thAitAk; jUfpwJ. ,tptpi d rhhej midj;J jftyfSk;
> fb;ffz;lthW Ntjprrkdghlby; FwpfggLfdwd.

$$2K_{(s)} + 2H_2O_{(i)} \rightarrow 2KOH_{(aq)} + H_{2(g)}$$

FwpaL	epi yi k myyJ ,ayepi y
s	jpz kk;
i	ehkk;
g	thA
aq	ehffi ury;

Ntjptpi dfspd; ti ffs;

mZ ffspd; kWtpi kgG jdikaig nghWjJ ti fggLjjy;
,Jtpu ehgfs; Ntjptpi dfs; gwwpAk> ,it vt;thW Ntjpr rkdghlhff;
Fwpffggdwd vdWk; fwwwpejhfs; xtnthUehSk; mjpr vz zpfi fapyhd
Ntjptpi dfs; eki kr; Rwwp elffpdwd. mit vyyhk; xU ti fahf
el ffpdwdwth? ,yiy. xtnthU tpi dAk; gyNtW ti fahd mZ ffis
csslfgpaJ. vdNt mit tpi dgLk; tpjKk; NtWgLfpwJ. vdNt xU tpi dapy;
<LgLk; tpi dgL nghUspd; mZ ffs; vt;thW khwwpai kffggLfdwd. vdgjd;
mbggi lapy; Ntjptpi dfi s gd;tUkhW ti fggLjjggLfpwJ.

Nrhfif f myyJ $Li f tpi dfs;

,uzL myyJ mjwF Nkwgl;l tpi dgL nghUs;fs; ,izeJ xU Nrhkk;
cUthfk; tpi d Nrhfif f myyJ $Li f tpi d MFk; ,jid 'njhFG tpi d"
myyJ ',iaG tpi d" vdW mi offyhk; 'A" kwWk; 'B" ,i ze J "AB" vdw
Nrhkk; cUthfFk; Nrhfif f tpi dapd; nghJthd tbtk; fNo nfhLffggLLssJ.
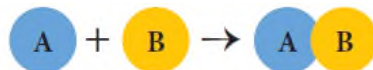
vLj;Jffhl;L: i` lu[d; thA FNshhpDld; ,i ze J i` lu[d; FNshiuL
thAit t jUfpwJ.

$$H_{2(g) +} + CI2_{(g)} \rightarrow 2HCl_{(g)}$$
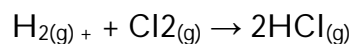
tpi dgL nghUspd; jdikaig nghUjJ Nrhfif f tpi dfs; "%dW ti ffshf"
ghpffggLfdwd.

jdkk; + jdkk; $\rightarrow$ Nrhkk;

jdkqfs; xdNwhnlhdW ,i ze J xU Nrhkjijj; jUfpdwd. ,ttif tpi dfs;
cNyhfk; kwWk; mNyhfqfSffpi lNa myyJ ,uzL mNyhfqfSffpi lNa
ei lngwyhk;

---

vLj;Jf;fhl;L 1: jpl; fej;fk; (rygh;) Mfrp[Dld; tpidGh;e;J fej;f il Mfi rL cUthfpwJ. ,t;tpid dapd;, U tpidgL nghUs;fSkl;mNyhfqfs; MFk;

$S_{(s)} + O_{2(g)} \rightarrow SO_{2(g)}$
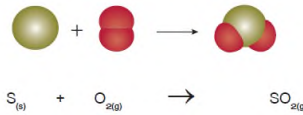
vLj;Jf;fhl;L 2: ntss;p Nghdw ntz;i kahd NrhbakhdJ ntsppa gri r fyej; kQrs; thAthd FNshhpDld; ,i z Ak; NghJ> czzj; jFej; Nrhbak; FNshi ui lj; jUfpwJ. ,q;F tpidgL nghUs;fspy> xdW cNyhfk; (Nrhbak)> kwnwhdW mNyhfk; (FNshhpd) MFk;

$2Na_{(s)} + Cl_{2(g)}$ 2NaCl(s)
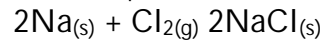
Nrhj;pf;f:

gpd;tUk; ml;ltiz apy; nfhLf;fpggl;l cNyhfqfs; kwWk; mNyhfqfs; ,ilNa rhjjpakhd $Lif tpid myyJ Nrhhpf tpidfis fz;lwpeJ mtwwpd; rkd; nraaggl;l tpidfis (rkdghl;il) vOJqfs;

cNyhfqfs;	mNyhfqfs;
Na, K, Cs, Ca, Mg	F, Cl,Br, I

Nrhkk; + jdpkk; → Nrhkk;
,t;tif Nrhfif tpidapy> xU Nrhkk; kwnwhU jdpkjJld; Nrheuj; xU Gjpa Nrhkjij jUfpwJ.

vLj;Jf;fhl;L: gh] gu] ; bi u FNshi uL> FNshhpDld; ,i z eJ gh] gu] ; ngz;lh FNshi ui lj; jUfpwJ.
$PCl_{2(l)} + Cl_{2(g)} \rightarrow PCl_{5(s)}$
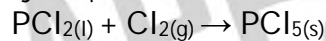
Nrhkk; + Nrhkk; → Nrhkk;
,rNrhfif tpidapy; ,uz;L Nrhkqfs; Nrheuj; xU Gjpa Nrhkjij cUthf;Ffpdwd. gpd;tUk; tpidapy;rpyf;fhd; il Mfi rL> fhyrpak; Mfi rLld; tpidGhpeJ fhyrpak; rpypNfli lj; jUfpwJ.
$SiO_{2(s)} + CaO_{s)} \rightarrow CaSiO_{2(s)}$
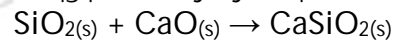
,awi fapy; epfOk; ngUkghyhd Nrhfif tpidfs; ntgg ckpo; tpidshFk; Vnddpy> ,q;F Gjpa gpiz gGfs; cUthffggLtjhy; mjpf Mwwy; ntggkhf ntspapll;ggLfpwJ.

rpi jT tpi dfs;

jFej; #oepi yapy> xU Nrhkk; rpi jTwW ,uz;L myyJ mjwF Nkwgll; vspa %yf;$Wfshf rpjTWk; tpid rpi jTtpidd vdggk; ,t;tpd; Nrhfif tpidfF vjph;tpid MFk; xU rpi jT tpidapd; nghJthd tbtk; fNo juggl;LssJ.
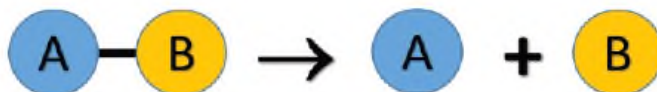
rpi jT tpidapd; xU Kf;fpa epfo;T> gpiz gGfs; ciltNjahFk; vdNt ,ttpidapd; NghJ gpiz gGfis cila Mwwy; Njitggl;LfpwJ. mtthW gadgLjjggLk; Mwwypd; ,ay gf; nghUj;J rpi jT tpidfs; %dW tifffshg; ghpfggLfdwd.
1. ntggr; rpi jT tpidfs;
2. kpd;dhw; rpi jT tpidfs;
3. xsp rpi jT tpidfs;

Rtwwpy; ntsi sabff ellWr; Rz z hkG fi uri yg; gadgLj;JffpNwhk; fhyrpak;
i ` luhfi rL> fhwwpy; , UffFk; fhhgd; - i l – Mfi rLld; tpi dGHpeJ fhyrpak;
fhhgNdl; c Uthfp nkyypa glykhf Rthfspy; gbfwlJ. ntsi sabjj , uz L
myyJ %dW jpdqfspy; fhyrpak; fhhgNdl; RthFS fF xU kpDkpDdGj;
jdi ki aj;jUfplwJ. Rz z hkGffyypd; (khhgps) Ntjp thgghL CaCO₃

$$Ca(OH)_{2(aq)} + CO_{2(g)} \rightarrow CaCO_{3(s)} + H_2O$$

ellWr;   fhhgd;   fhyrpak; ell;
     Rz z hkG il-Mfi rL fhhgNdl;
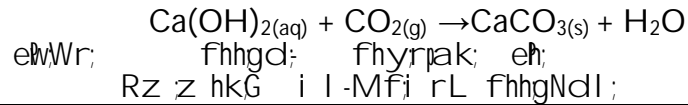
ntggr; rpi jT tpi dfs;

, tti f tpi dapy; tpi dgLnghUs; ntggjjpdhy; rpi jTWfplwJ.

vLj;Jffhl;L: nkhFhp (II) Mfi] L ntggjjpdhy; rpi jTwW nkhFhp kwWk;
Mfrp[d; thAthf khWfplwJ. ntggjjj vLj;Jf; nfhz L , ttpi d epfo;tjhy;
, J ntggr; rpi jT tpi d vdggLfplwJ. NkYk; , ttpi d> NrhkjjpyupeJ jdkk; /
jdkk; rpi til jy; vdw ti fi ar; rhhejJ. mjhtJ nkhFhpf; Mfi] L> nkhFhp
kwWk; Mfrp[d; vdw jdkqfshfr; rpi til lfplwJ.

$$2HgO_{(s)} \xrightarrow{ntgpak} 2Hg_{(l)} + O2_{(g)}$$

, J Nghdw> fhyrpak; fhhgNdli l ntgggLj;Jk; NghJ> mJ rpi jTwW fhyrpak;
Mfi rL kwWk; fhhgd; - i l Mfi rlhf khWfplwJ. , ttpi d NrhkjjpyupeJ
Nrhkk; / Nrhkk; vdw ti fi ar; rhhejJ.

$$CaCO_{3(s)} \xrightarrow{ntgpak} CaO_{(s)} + CO_{2(g)}$$

ntggrpi jT tpi dfspy; gpi z gGfpi s ci lggjwF ntggk; juggLfplwJ. , J
Nghdw ntggjjj cwpQRk; tpi dfpi s 'ntggnfhs; tpi dfs;' vdyhk;

kpddhw; rpi jT tpi dfs;
rpy rpi jT tpi dfspy; kpddhwwy; tpi di a epfojjg gadgLfplwJ.
vLj;Jffhl;hf Nrhbak; FNshi uL fi urpy; kpddhwwi y nrYj;Jk; NghJ
Nrhbak; FNshi uL rpi jTwW cNyhf Nrhbak; kwWk; FNshhpd; thA
cUthfplwd. , epfo;T 'kpddhw; gFgG" vdggLk;

$$2NaCl_{(aq)} \xrightarrow{kpddhwwy} 2Na_{(s)} + Cl_{2(g)}$$
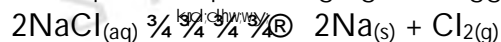
, qF Nrhbak; FNshi uL> Nrhbak; kwWk; FNshhpd; vdw jdkqfshf khWfplwJ.
vdNt , J Nrhkjjpyupej jdkk; - jdkk; vdw ti fi ar; NrhejJ.

xspr;rpi jT tpi dfs;
xspahdJ rpi jT tpi dfpi s epfoj;Jk; kwnwhU ti f Mwwy; MFk;
vLj;Jffhl;L: rpysth; GNuhi kL kPJ xsp gLknghOJ> mJ rpi jTwW rpysth;
cNyhfjijjAk>> GNuhkpd; thAi tAk; jUfplwJ. xspahdJ , rrpi jt
epfoj;Jtjhy , ttpi d "xspr;rpi jT" vdggLk;

$$2AgBr_{(s)} \xrightarrow{xsp} 2Ag_{(s)} + Br_{2(g)}$$
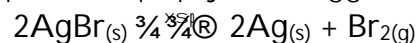
, qF kQrs; epw rpysth; GNuhi kL , JTk; NrhkjjpyupeJ jdkk; - jdkk; vdw
rpi jTWjy; ti ffF vLj;Jffhl;lhFk;

xwiw , lgngahrrp tpi dfs;
, tti f tpi d xU jdkk; kwWk; Nrhkjjpwfp lNa epfojjhFk; mi t tpi dgLk;
nghOJ NrhkjjpYss x jdkk; kwnwhU jdkjjhy; , lgngahrrp milej Gjpu
Nrhkjjj jAk> jdkjjj jAk; jUfplwJ. xdwiw , lgngahrrp tpi dfspd; nghJthd
tbtk; tUkhW.

தனிமம்   சேர்மம்   சேர்மம்   தனிமம்

jdpkk; 'A', MdJ 'B' vdw jdpkjij mjDila Nrhkkhd 'BC'-apypUe;J ,lgngahrrp nraf;wJ. vdNt ,J xwiw ,lgngahrrp tpid vdgg;LfpwJ.

Jjjehf cNyhfjij i`lNuhFNshhpf; mkpyjjpy; itfFk; nghOJ i`lu[d; thÅ ntsptpUf;wJ. ,qF i`lu[d; Jjjehfjjhy; ,lgngahrrp nraaggl;L Jjjehf FNshiuUL cUthf;wJ.

$$Zn_{(S)} + 2HCl_{(l)} \rightarrow ZnCl_{2(l)} + H_{2(g)}$$

$$Fe_{(S)} + CuSO_{4(aq)} \rightarrow FeSO_{4(aq)} + Cu_{(S)}$$
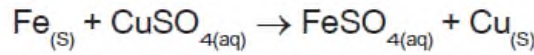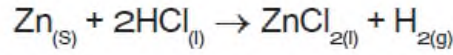
fhggh; IlryNglbd; eHffi urypy; xU ,UkG Mzpia itfFk; nghOJ ,UkG>fhggiu u ,lgngahrrp nraf;wJ.

tpid dgLnghUsfspy; NtWgl;l Nrhfif f %yk; ,JNghadw gyNtW tpidfis ehk; Kd; itff KbAk; Mdhy; mitnayyhk; eilKiwapy; elfFkh? ,yiy. ,jid vsjhf N`y[dfis nfhzl L tpsff KbAk; vLjJffhl;lhf fbffzl ,U Ntjptpidfis fUJNthk;

$$2NaCl_{(aq)} + F_{2(g)} \rightarrow 2NaF_{(aq)} + Cl_{2(g)}$$

$$2NaF_{(aq)} + Cl_{2(g)} \rightarrow 2NaCl_{(aq)} + F_{2(g)}$$
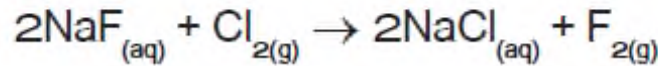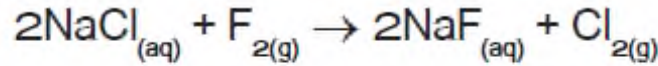
Kjy; tpidapy; Nrhbak; FNshi ubypUe;J FNshhpd; G@hpidhy; ,lgngahrrp nraaggLfwJ. ,uzlhk; tpidapy; FNshhpd> G@hpid Nrhbak; g@iubypUe;J ,lgngahrrp nraf;wJ.

Nkwfz;l ,uzL tpidfspy; ,uzlhk; tpid elff ,ayhJ. Vnddpy; FNshhpid tpl G@hpid tpidjwwd; kpffJ. NkYk; jdpk thpir mljizapy; FNshhpDff NkNy cssJ. vdNt ,lgngahrrp tpidfspy> jdpkqfspd; tpidjwwd; kwWk; jdpk thpir mljizapy; mtwwpd; ,lk; Mfaitt tpid eilngWtij jhPkhdpfFk; Kffpa fhuzpfshf ,Uffpdwd. mjpf tpidjwwd; nfhzl jdpkqfs; Fiwej tpidjwwd; nfhzl jdpkqfis mtwwpd; fiurypUe;J ,lgngahrrp nraf;pdwd.
rpy jdpkqfspd; tpidjwwd; thpir fNo juggl;LssJ.

To remember ⬇	Activity Series ⬇	
Please	Potassium (K)	அதிக வினைதிறன் மிக்கது ⬆
Send	Sodium (Na)	
Lions	Lithium (Li)	
Cats	Calcium (Ca)	
Monkeys	Magnesuim (Mg)	
And	Aluminium (Al)	
Zebras	Zinc (Zn)	
Into	Iron (Fe)	
Lovely	Lead (Pb)	
Hot	Hydrogen (H) non–metal	
Countries	Copper (Cu)	குறைந்த வினைதிறன் மிக்கது
Signed	Silver (Ag)	
General	Gold (Au)	
Penguin	Platinum (Pt)	

,ul; il Nrhkq;fs; tpi dGhpAk; nghOJ mtw&pd; madpfs; ghpkhwpf; nfhss gLkhdhy; mt;tpi d ,ul; ill ,lgngahrrp vdggLfpwJ. xU Nrhkj;jpd; madp kwnwhU Nrhkj;jpd; madpahy; ,lgngahrrp nraaggLfpwJ. xNu khjphp kpd; Ri kfs; nfhz;l madpfs; ghpkhwpf; nfhssggLfppdwd. mjhtJ xU Neh; madp kwnwhU Neh; madpahy; ,lgngahrrp nraaggLfpwJ. ,jjifa tpi d "nkl;lhjpp]pl; tpi d" vdTk; mi offggLfpwJ. ,ul; il ,lgngahrrp tpi dia a gpd;tUkhW Fwggpl yhk;

xU ,ul; il ,lgngahrrp tpi d ei lngWtjwF> tpi dtpi d nghUs;fspy; xdW tbgbthf ,Uff Ntz;Lk; myyJ elhf ,Uff Ntz;Lk; ,t;thwhf ,U ti fahd ,lgngahrrp tpi dfs; cssd. mi tahtd:
  1. tbgbthffy; tpi d
  2. egLepi yahffy; tpi d

Nrh;fis f tpi dfFk> rpi jT tpi dfFk; ,i lNa css NtWghLfs;

Nrh;fis f tpi dfs;	rpi jT tpi dfs;
xdW myyJ mjwF Nkwgl;l tpi dgLnghUs;fs; Nrhe;J xwi w tpi snghUi sj;jUk;	xwi w tpi dgL nghUs> xdW myyJ mjwF Nkwgl;l tpi s nghUshf rpi jffggLfpwJ
Mwwy; ckpoggLfpwJ.	Mwwy; cwQrggLfpwJ
tpi dgL nghUs;fs; jdpkqfshfNth> Nrhkqfshf;Nth ,Uffyhk;	tpi dgLnghUs; xwi w Nrhkkhf;Fk;

tbgbthffy; tpi dfs;
,U Nrhkqfspd; ehffiuryfi s fyfFk; nghOJ> mit tpi dGhpeJ ehpy; fi uahj xU tpi snghUSk> ehpy; fi uAk; xU tpi snghUSk; Njhdwpdhy;

mt;tpi d tbgbthf;fy; tpi d vdggLk; xU tpi snghUs; tbgbthf ,Uggjhy; ,t;tif tpi d tbgbthf;fy; tpi d vdggLfpwJ.

vLj;Jf;fhl;lhf nghl;lhrpak; mNahi IL kwWk; nyl; i elNulbd; njspthd ehf;fi uryfi sf; fyffk; nghOJ xU ,ulii ,lgngahrrp tpi d elf;fpwJ.

$$Pb(NO_3)_{2(aq)} + 2KI_{(aq)} \rightarrow PbI_{2(s)} + 2KNO_{3(aq)}$$
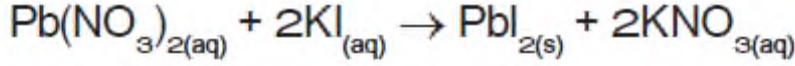
,q;F nghl;lhrpapKk; nyl; cNyhfKk; xdi wnahdWld ,lgngahrrp nra;J nfhz;L kORs;epw nyl; mNahi IL Nrhkjjj jUfpwdw.

eLepi yahf;fy; tpi dfs;

cqfSila Kei ja tFgGfspy; xU mkpyKk; fhuKk; vt;thW tpi dgLfpdwd vdgij fwWUffpwhfs; ,J ,lgngahrrp tpi dfF kwnwhU vLj;Jf;fhl;lhFk; ,q;F xU mkpyKk; fhuKk; tpi dGhpeJ cgGk; eLUk; fpi lffpdwd. ,t;tpi d eLepi yahf;fy; tpi d vdggLfpwJ. Vndddpy mkpyKk> fhuKk; xdiwnahdWld eLepi yahf;fpdf nfhsfpdwd.
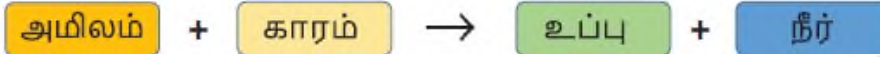
Nrhbak; i ` IuhfiffL kwWk; i ` INuh FNshhpf; mkpyjjpwF ,illNaahd tpi d eLepi yahf;fy; tpi dfF xU vLj;Jf;fhl;lhFk; ,q; Nrbak> i ` Iu[id i ` INuhFNshhpf; mkpyjjpwpUeJ ,lgngahrrp nrafpwJ. ,jd tpi sthf Nrhbak; FNshi uL vdw eLepi yahd ehpy; fi uAk; cgG fpi lffpwJ.

$$NaOH_{(aq)} + HCl_{(aq)} \rightarrow NaCl_{(aq)} + H_2O_{(l)}$$
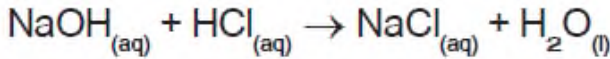
,Nj Nghy; mkNkhdpak; i ` IuhfirL vdw fhuk; i elhpf; mkpyj;Jld; tpi dGhpAk; nghOJ mkNkhdpak; i elNul; vdw cgGk> eUk; fpi lffpwJ.

$$NH_4OH_{(aq)} + HNO_{3(aq)} \rightarrow NH_4NO_{3(aq)} + H_2O_{(l)}$$
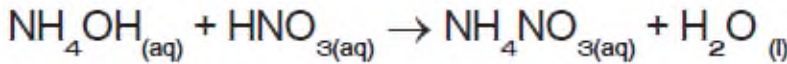
vhpjy; tpi dfs;

xU vhpjy; tpi dapy> tpi dgL nghUs; kpfTk; tpi uthf Mfrp[DId; Nrhe;J vhpe;J xdW myyJ gy Mfi rLfisAk; ntgg Mwwi yAk; jUfpdwd. vdNt xU vhpjy; tpi dapd; tpi dgL nghUsfspy; xdW Mfrp[dhfk; ngUkghdi kahd vhpjy; tpi dfs; ntgg Mwwy; %yqfshf ekKila midwhl thoitgpd nraygghLfspy; gadgLfpdwd. vLj;Jf;fhlhf ekKila tLfspy; ri kff LPG vdggLk; jputkhf;fgglL ngINuhypa thAtg gadgLj;JfNwhk; LPG d; gFjpngghUsfs; Mfrp[DdhL Nrhe;J vhpjhy; ntggKk> jhRthi yAk; czlhfpdwd. LPG vdgJ GNuhgNgd> gpA&NNid; kwWk; GNuhggybd Nghdw i ` INuhfhhgd; thAffspd; fyi tahFk; mi dj;J i ` INuh fhhgdfSk; Mfrp[DId; vhpeJ fhhgd; - i l- Mfi ri lAk; el uAk; jUfpdwd.
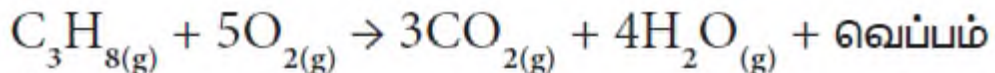
$$C_3H_{8(g)} + 5O_{2(g)} \rightarrow 3CO_{2(g)} + 4H_2O_{(g)} + \text{வெப்பம்}$$
புரோப்பேன்

Nkw$wpa tpi dapy> ntggk; cUthtjhy; ,J xU ntgg ckp; tpi dahFk; Mfrp[d NrUjjhy; ,J NkYk; Mfrp[Ndww tpi dahFk; vdNt vhpjy; tpi di a ntgg ckp; Mfrp[Ndwwk; vdyhk; RIh cUthdhy; mjid vhpjy; vdfNwhk;

fbfz ;ltWs; vJ vhpjy; tpi d?
   1. cz T nrhpjjy;
   2. ,UkG JUggbjjy;

vz z ww tpi dfs> ,Jti u ehk; fww IeJ ti fahd tpi dfspy; mlqFk;
,t;tpi dfi s gwwp NkYk; gyNtW tptuqfi s tpsffkhf cqfSi la cah;
tFgGfspy; fwf ,Uffwh;fs;

tpi d ei IngWk; jpi ri af; nfhz L ti fggLj;Jj y;
cqfi sr; Rww xtnthU ehSk; vz z ww khwwqfs; VwgLfpdwd vdgJ
cqfSf Fj; njhpAk; mej khwwqfs; eguejukhdi tah? jput epi yapy; c s s eh>
jpul epi y gdpfflbahf ci wfpwJ. gdpfflb cUfp euhf khWfpwJ. vdNt
ci wjy; vdgJ kISkhwwk; ,J euueju khwwkyy. ,J xU ,awqpay; khwwk;
,awgpay; khwwqfs; kISkhwwqfshFk; Mdhy; Ntjp khwwqfs; kISkhwwqfsh?
mjhtJ> tpi d tpi snghUsfs; kIz Lk; tpi dgL nghUsfshf khWkh? kufflj I
vhpAk; epfoi t vLj;Jfnfhs;Nthk; kujjpy; css fhhgd; Nrhkqfs; vhpejJ fhhgd;
i I Mfi rL thA kwWk; euhfTk; khWfpwJ.

fhhgd;i I-Mfi rL kwWk; euuAk; Nrhj;J kuji j kIz Lk; ngw KbAkh? ekkhy;
ngwKbahJ. vdNt ,J xU epueju khwwk; MFk; ngUkghyhd tpi dfspy;
tpi dgL nghUsfi s> tpi dtpi s nghUsfspyUeJ ngw ,ayhJ. Mdhy; rpy
Ntjp tpi dfi s kIS; tpi dfshf khwwyhk; ek; ifNgrp ,aqfj; Nji tahd
Mwwi y> mjpy; css yjjpnk; madp kpdfyd> Ntjp tpi dfs; %ykhf
c z IhfFpdwd. ,eepfoT kpd;dpwffk; vdggLk; i fgNgrpa kpdNdwwk; nraAk;
NghJ ,tNtjptpi d kps; tpi dahfpwJ. vdNt Ntjptpi dahdJ jFej
#oepi yapy; kIz Lk; epfof; nraayhk; vdNt ,t;tpi dfs; ,uz L ti ffshf
ti fggLjjggLfpdwd. mi t kIs; tpi dfs; kwWk; kISh tpi dfs; MFk;

kIS;tpi dfs;
kIS; tpi dfs; vdgi t kIz Lk; epfof$ba tpi dfs; MFk; mjhtJ tpi dtpi s
nghUsfi s> tpi dgL nghUsfshf khwwKbAk; xU kIS; tpi di a fbffz ;thW
Fwpffphk;

tpsffk;
Nkwfz ;I tpi dapy> tpi dgL nghUs; AB MdJ rpi jTwW tpi dtpi snghUs; 'A"
kwWk; "B" fpi Iffpwdwd. ,J KdNdhf;F tpi dahFk; ,t;thW cUthFk; tpi d
tpi s nghUshd A kwWk; B kIz Lk; ,i z eJ AB vdw Nrhkkhf khWfpwd. ,J
gpdNdhf;F tpi d vdggLk; MfNt ,ej tpi d KdNdhf;F kwWk; gpdNdhf;F
jpi rfspy; eiIngWfpwJ. mggbahapd; Nkwfz ;I tpi dapy; vej xU tpi dtpi s
nghUsfSk; cUthftpi y vdW fUJfpwhah? ehp mtthW fUjpdhy; mJ jtW.
Vnddpy; tpi dahdJ ,U jpi rfspy; epfoejhYk; tpi dapd; njhlffjjpy;
mtwwpd; tpi dNtfk; rkkhdjhf ,yi y.

v.fh: gh] gu] ; ngdhhFNshi uL rpi jTwW gh] gu] ; bi u FNshi uL kwWk;
FNshhpi dj; jUk; tpi di a vLj;Jfnfhs;Nthk;

$$PCl_{5(g)} \rightleftharpoons PCl_{3(g)} + Cl_{2(g)}$$

PCl_5rpi jTWjy; KdNdhf;F tpi dahfTk;>PCl_3 kwWk; Cl_2, i z eJ PCl_5c Uthjy;
gpdNdhf;F tpi dahfTk; ei IngWfpwJ. Kjypy; tpi dapd; Jtfjjpy; KdNdhf;F
tpi dahdJ> gpdNdhf;F tpi di a tpI Ntfkhf ei IngWk; rpwpJ Neujjpwf gpwF
KdNdhf;F kwWk; gpdNdhf;F tpi dapd; NtfkhdJ rkkhfpwJ. vdNt gpdNdhf;F
tpi d ei IngWtjhy; PCl_5KOi kahf rpi jtilahJ. ,J kIS;tpi dahFk;> Ntjpr
rkepi yapd; NghJ PCl_5, d; nrwpthdJ PCl_3kwWk; Cl_2-, d; nrwpi t tpI mjpfk;

kIS;tpi dapd; NghJ tpi dtpi s nghUsfi s mi t cUthd cINd eFFtJ
%ykhfNth myyJ Fwpggpl I fhy ,i Intspapy; tpi dgLnghUsfi s Nrhggjd;
%ykhfNth mjpf msT tpi d tpi s nghUsfi s ngwKbAk;

$$2H_2O_{2(aq)} \rightleftharpoons 2H_2O_{(l)} + O_{2(g)}$$

kIsh tpi dfs;

xU tpi dapy; tpi dgL nghUsfis kIzLk; ngw ,ayhj tpi d 'kIsh tpi d" vdggLk; ,t;tpi d xNu jpi rapy; klLNk epfOk; mjhtJ KdNdhfF tpi dahf klLNk ei IngWk;

$$C_{(s)} + O_{2(g)} \rightarrow CO_{2(g)} + வெப்பம்$$

நிலக்கரி ஆக்சிஜன் கார்பன் டைஆக்சைடு

epyffhp vhgj y; tpi dapd; NghJ fhhgd;il MfirL thAi tf;nfhLffpwJ. ,t;tpi dapy; epyffhahdJ Mfrp[Dld; tpi dGheJ fhhgd; il MfirL thA kwWk; ehpd ntspapLfpwJ. ,jpy; cUthd fhhgd; il MfirL thAthdJ klLk> epyffhahfTk> Mfrp[dhfTk khw ,ayhJ. vdNt ,t;tpi d kIshtpi d vdggLk; kIs;tpi d kwWk; kIsh tpi dfF ,ilNaahd NtWghLfs; nfhLffggl Lssd.

kIs;tpi d kwWk; kIsh tpi dfF ,il Naahd NtWghLfs;

kIs;tpi d	kIsh tpi d
jFej #oepi yapy; KdNdhfF kwWk; gpdNdhfF tpi dfs; ei IngWk;	KdNdhfF tpi d klLk; ei IngWk; (gpdNdhfF tpi d ei IngwhJ)
KdNdhfF kwWk; gpdNdhfF tpi dfs; xNU Neujjpy; ei IngWk;	xNu jpi rapy; klLNk ei IngWk; tpi d KdNdhfF tpi dahFk;
tpi dahdJ rkepi yia mi IAk;	tpi dahdJ rkepi yia mi IahJ
tpi dgL nghUsfs; KOtJk; tpi dtpi s nghUsfshf khw ,ayhJ	tpi dgL nghUsfs; KOtJk; tpi dtpi s nghUsfshf khwf; $baJ
,t;tpi d nkJthf ei IngWk;	Ntfkhf ei IngWk;

,t;tpi dfs; gwwa gw jftyfis cqfs; Nky; tFggpy; gbgghfs;

Ntjptpi dapd; Ntfk;

,Jtiu ehk; Ntjptpi dfspd; gyntW ti ffisAk> tpi dgglLnghUsfs> tpi snghUsfspd; ,ayigAk; gwwp tpthjpjNjhk; ehk; fbffzl tpi dfi sf; fUJNthk;

• ,UkG JUggpjjy;
• c z T nrhpjjy;
• ngl Nuhy; vhjy;
• ghi wfs; rpi j tilj y;

xtnthU tpi dAk; vt;tsT Ntfkhf ei IngWfpwJ? kpf nkJthd tpi dapypUeJ kpf Ntfkhd tpi d tiu thpi rggLjJ? vJ nkJthdJ? vJ Ntfkhdnh J? vdgij vt;thW eP jhkhpgggha? xU tpi d vt;tsT Ntfkhf ei IngWfpwJ vdgjj jhkhdpfFk; topfSs; xdi wg gww ghhgNghk; Fwpjj fhyjjpwFg gpwF xU Ntjptpi dapy; <LgLk; tpi dgL nghUsfs> cUthFk; tpi snghUsfs; Mfpatwwpd; msitf; fz ffpL. vLjJfffhl l;hf 100 fphk; Ntjgnghs; tpi dfFlgLfpwJ vdW fUJNthk; xU kzp Neujjpw;Fg gpwF 50 fphk; 'A' klLNkssJ vdf; nfhsNthk;

$$A \rightarrow tpi snghUs;$$

kwnwhU ti fapy; 100 fphk; 'C' vdw Ntjgnghs; tpi dapplL xU kzp Neujjpw;Fg gpwF 20 fphk; 'C' vQrpAssJ vdf; nfhsNthk;

$$C \rightarrow tpi snghUs;$$

, gnghOJ mjNtfkhd tpid vJntdW cddhy; $w , aykh? Kjy; tpidapy;
50 fp tpi dgnghUs; tpi snghUshf khwpAssJ. Mdhy; , uz;lhk; tpidapy; 80 fp
tpi dgL nghUs; 1 kz p Neujjpy; tpi snghUshf khwpAssJ. vdNt , uz;lhtJ
tpid Ntfkhf ei lngWfpwJ. , ej mstl;L Ki wNa tpidNtf Ki w vdggLk;
"xU Ntjp tpi dapd; Ntfk; vdgJ xuyF Neujjpy; VjhtJ xU tpi dgLnghUs;
myyJ tpi snghUs;fspd; msT myyJ nrwptpy; VwgLk; khwwkhFk;;

      fbffz l tpi di af; fUJNthk;

            A → B

, t;tpi dapd; Ntfk; gpd;tUkhW vOJggLfpwJ.

$$\text{Ntfk;} = -\frac{d[A]}{dt} = +\frac{d[B]}{dt}$$

       , q;F
       (A) vdgJ A , d; nrwpthFk;;
       (B) vdgJ B , d; nrwpthFk;;

'vjphf;Fwp' Neujij g; nghWj;J A , d; nrwpT Fi wti jf; fhl;Lfpwpd.

Nehf;Fwp Neujij g; nghWj;J B d; nrwpT $Lti jf; fhl;Lfpwpd.

FwpgG [ ] Fwp nrwpi tf; FwpffpwJ. 'd' vdgJ fhyji j g; nghWj;J nrwptpy;
VwgLk; kpfr; rpwpa khwwji j g; FwpffpwJ.

tpi dapy; tpi dapd; Ntfk; Vd; Kf;fiaj;Jk; ngWfpwJ?

tpi d Ntfk; mjpfkhf , Uf;FkhdghJ Fwpggpl;l Neujjpy; mjpf msT
tpi snghUs;fs; fpilf;Fk; vdNt xU Ntjpapyhshf;F mjpf msT tpi d tpi s
nghUs; ngUjwF tpi dNtfk; Kf;fpakhdjhFk;; NkYk; tpi dNtfkhdJ czT
gjggLjJjypy; tpi dapd; Ntfjij Fiwj;J czT nfLl;Nghti j j;thff
KffpakhdjhFk;

Ntjptpi dfspd; Ntfji j ghjpf;Fk; fhuz pfs;

xU tpi dapd; Ntfji j khww , aYkh? tpi dapd; Ntfji j khww , aYk; v.fh.
, Ukghd J JUggpjjiy; ehpy; ei lngWti j tpl mki pyjpy; Ntfkhf ei lngWk;
tpi dapd; Ntfji j ghjpf;ff; $ba Kf;fpa fhuz pfs;

1. tpi dgL nghUs;fspd; jdik
2. ntggepi y
3. tpi dAffp
4. mOjjk;
5. tpi dgL nghUspd; Gwgguggsj;

tpi dgL nghUs;fspd; jdik:

Nrhbak; i ` lNuhfFNshhpf; mkpyj;Jld; Ntfkhf tpi dGhpfpwJ. Mdhy; mplbf;
mkpyj;Jld; nkJthf tpi dGhpfpwJ.

Vnddpy; i ` lNuhfFNshupf; mkpyk; mplbf; mkpyji j tpl tpi djwd; kpffJ.
vdNt tpi dgLnghUspd; , ayG tpi dNtfji j ghjpffpwJ.

$$2\ Na_{(s)} + 2HCl \rightarrow 2NaCl_{(aq)} + H_{2\ (g)} \text{ (Ntfkhf)}$$
$$2\ Na_{(s)} + 2CH_3COOH_{(aq)} \rightarrow 2CH_3COONa_{(aq)} + H_{2(g)} \text{(nkJthf)}$$
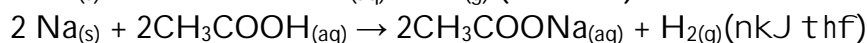
ii. tpi dgL nghUspd; nrwpT

       tpi dgL nghUs;fspd; nrwpT mjpfupffk; NghJ tpi dNtfk; mjpfupffpwJ.
Fwpggpl;l fd msT nfhz;l fiurypy; fiue;Jss fi unghUspd; msNt nrwpT

MFk; nrwpT mjpfkhf ,UfFk; NghJ Fwpggpy] fdmstpy; Jfsfspd;
vz z pfii f mjpfkhf fhz ggLk; vdNt tpi dapd; NtfKk; mjpfhpfFk;

Jjjehf Jfsfs> 1 M i` lNuhFNshupf; mkpyjijtpl 2 M
i` lNuhFNshupf; mkpyjjpy; Ntfkhf tpi d GupfpdwJ.

iii. ntggepi y

ntggepi y caUkNghJ tpi dapd; NtfKk; mjpfupfFk; Vnddpy; ntggk;
mjpfupfFk; NghJ tpi dgLnghUsfspd; gpi z gGfs; vspjpy; ci leJ tpi dapd;
Ntfk; mjpfupfpwJ. mi w ntggepi yapy; fhyrpak; fhugNdll; nkJthf tpi dGupAk;
Mdhy; ntggggLj;JkNghJ tpi dapd; Ntfk; mjpfupfFk;

> mi w ntggepi yapy; i tffggLk; cz TnghUshdJ Fspurhj dg;
> nglbapy; i tffggLk; cz i tpl tpi uthf nfllgNghpwJ. Fspurhjd
> nglbfs; ntggepi yahdJ mi w ntggepi y tpl Fi wthf ,UfFk; tpi dapd;
> Ntfk; Fi wthf ,Uggjhy; cz T nfllgNghfFk; NtfKk; Fi wthf ,UfFk;

iv. mOjjk;

thAepi yapYss tpi dgL nghUsfspy; mOjjk; mjpfupfFk; NghJ
tpi dapd; NtfKk; mjpfupfFk; Vnddpy; mOjjjij mjpfupfFkNghJ tpi dggL
nghUsfspd; Jfsfs; kpf mUNf teJ mbfhb Nkhjiyupy; <LgLfpdwd.

v. tpi dAffp

tpi dAffp vdgJ tpi dapy; Neubahf <LglhJ> Mdhy; mttpi dapd;
Ntfjij mjpfupfFk;

nghllhhrpak; FNshNulijl #LgLjJk; NghJ Mfrp[d; kpff Fi wthd
Ntfjjpy; ntspaNaWfpwJ. Mdhy; khqfdR il Mfi]il tpi dgL nghUSld;
Nrujj gpwF Mfrp[d;ntspaNaWk; Ntfk; mjpfupfFpwJ.

vi. tpi dgL nghUsfspd; GwgguggsT

Ntjptpi dapy; flbahd tpi dgL nghUsfi s tpl> J}shffggll tpi dgL
nghUsfs; tpi uthf tpi dGupAk;

v.fh. flbahd fhyrpak; fhugNdllil tpl Jshffggll fhyrpak; fhugNdll;
i ` lNuhFNshupf; mkpyjJld; kpf tpi uthf tpi dGupAk> Vnddpy; J}shffggll
fhyrpak; fhugNdllby; GwgguggsT mjpfsT ,Uggjhy; tpi d Ntfhf epofofpwJ.

rkepi y

kPs;tpi dapy; KdNdhfF tpi dAk> gpdNdhfF tpi dAk; xNu Neujjpy;
ei lngWk; KdNdhfF tpi dapd; NtfKk> gpdNdhfF tpi dapd; NtfKk; rkkhf
,UfFk; NghJ tpi d tpi s nghUsfs; cUthfhJ. ,ej epi yfF rkepi y vdW
ngau> ,ej epi yi a mi lej gpwF> tpi dgLnghUs; kwWk; tpi dtpi s
nghUsfspd; mstpy; khwwk; Vwgltj ,yi y. xU Ntjptpi dapy; vlilggLk;
rkepi yNa Ntjpr rkepi y vdgLk;

Ntjpr rkepi y vdgJ xU kPsNtjptpi dapd; tpi dgLnghUs; kwWk; tpi d
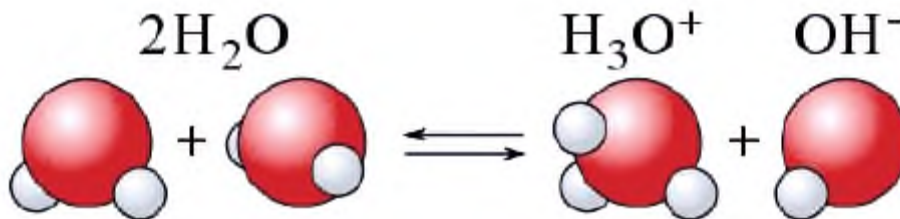tpi snghUspd; nrwptpy; vej khwwKk; epFohj epi y MFk; rkepi yapy;

KdNdhfF tpi dapd; Ntfk; = gpdNdhfF tpi dapd; Ntfk;

tpsf;fk;

tpidapd; njhlf;fj;jpy; KdNdhf;F tpidapd; NtfkhdJ> gpdNdhf;F tpidapd; Ntfj;ij tpl mjpfk; ,Uej NghjpYk; tpid eilngWk; nghOJ tpidgLnghUspd; nrwpT FiwfpwJ kwWk; tpidtpisnghUspd; nrwpT mjpfupffpwJ. tpidNtfk; vdgJ nrwpTfF Neu;tpfsj; njhlu;GilaJ Mifahy; KdNdhf;F tpidapy; tpidgL nghUspd; nrwpT Neuj;ijg; nghUj;J Fiwtjhy> tpidNtfKk; FiwfpwJ. mNjNghy; gpdNdhf;F tpidapd; tpidNtfk; mjpfupffpwJ.

xU Fwpggpl;l epiyapy;> ,U tpidafspd; tpidNtfKk; rkkhfpdwd. ,eepiyapy; tpidgL kwWk; tpisnghUspd; nrwpT Neuj;ij khWtjpy;iy. ,ej epiy yia rkepiy vdfpNwhk;

fhyrpak; fhugNdl; rpijeJ fhyrpak; Mfird;lhfTk> fhugd; ilMfird;lhfTk khWk; tpidia af; fUJNthk; ,ej tpid xU klstpid. xU Ntjptpidahapd; NtfkhdJ vt;tsT tpiuthf mjd; tpidgL nghUspYk; msT FiwfpwJ vdgj ruhejhFk; ,ej tpid> xU %ba fydpy; eilngwwhy; mJ Ntjprr rkepiyia milAk;

$$CaCO_{3(s)} \rightleftharpoons CaO_{(s)} + CO_{2(g)}$$

$CaCO_3$d; rpijjT = CaO kwWk;CO_2
tpidNtfk;   Nruifif tpidapd; Ntfk;

Ntjpapay; khwwqfs; kl;Lkdwp ,awpay; khwwqfSk; rkepiyia mila tyyJ.

%ba fydpy; itf;fggll ePhdJ> MtpahFk; NghJ ePhtpahahf khw fydpy; xU mOjjij VwgLj;JfpwJ. xU Fwpggpl;l epiyapy; ePhtpah FsneJ ePhf khWfpwJ. ,t;thW Mtp RUq;Fk; Ntfk; ePhtpahahf khWk; NtfKk; rkkhFk; NghJ> ,eepfo;T rkepiyia mil fpwJ.

$$H_2O_{(l)} \rightleftharpoons H_2O_{(g)}$$

,eepiyapy; (,uz;L epi yfspy;) ePhpd; fd msTk> ePhtpahapd; fd msTk; khwhJ. ,J xU ,awpay; khwwk; MFk; vdNt ,kkhwwjjpy; vl;lggLk; rkepiy ,awpay; rkepiy vdW miof;fggLfpwJ. ,awpay; rkepiy vdgJ midj;J epiyapYk; fdmsT khwhJ. (ePhtpah eh).

rkepiyapd;gz Gfs;

1. Ntjpr; rkepiyapy; KdNdhf;F tpidapd; NtfKk> gpdNdhf;F tpidapd; NtfKk; rkk;

2. Neuj;ij nghUj;J mOjjk> nrwpT> epwk> mlhj;jip ghFepiy Nghdwit khwhJ.

3. Ntjpr; rkepiy vdgJ xU ,aq;Fr; rkepiy Vndldpy; KdNdhf;F tpidAk> gpdNdhf;F tpidAk; njhlhoe;J epiyahf elejJ nfhz; bUf;Fk;

4. ,awpay; rkepiyapy> midj;J epiyia kfSk; khwhj fdsi tg; ngWfpdwd.

fhwwi lf;fggll Fspnghdqfspy; fhhgd; il MfirL eiPy; fi uf;fggll (Nrhlh)

xU ghl‍y‍py; i tf‍f‍gglLssJ. thA nts‍Nawh tzzk; mi lff‍gglLss epi ya‍py; ghl‍yp‍y; fi uf‍f‍gg‍l‍ l fhhgd; i l Mfi rL thATk; (fhhghd‍pf; mkp‍yk)> thA ep‍i y fhhgd; i l Mfi rL thATk; xdWld; xdW rkep‍i ya‍py; cssd. eb‍pfs; ghl‍bi yj; jw‍ej Tl d; thAep‍i y fhhgd; i l Mfi rL nts‍NaWfp‍wJ. vdNt fi uf‍f‍gg‍l‍ l fhhgd; i l Mfi rL thA nts‍NaWk; nghUl‍iL fi uah ep‍i yfF‍ kl‍z Lk; jp‍UkGfp‍wJ. vdNt jhd; e‍l ghl‍bi yj; jw‍e:J e‍l‍z l Neuk; i tf‍Fk; nghOJ fhhgd; i lMfi rL mi dj;Jk; nts‍Naw‍p CO_2 , yyhj jp‍utkhf khWfp‍wJ.

ep‍hpd; madp‍g ngUf‍fk;

J}a e‍h; xU kp‍df‍l jj‍hg; nghUs; vd‍W ngUkghYk; fUj‍g‍gl‍lh‍Yk; Jyyp‍akhd mstl‍Lfs; J}a e‍h; rp‍wj‍ST kp‍drhujj‍jf; f‍l j;Jfp‍wJ vdgj‍f; fhl‍LtJ fz‍l‍ w‍pa‍gg‍l‍LssJ. ,J e‍hpd; jd; madp‍ahj‍y; tp‍s;thy; ei lng‍Wf‍pwJ. e‍hpd; Ra myyJ Ra madp‍ahj‍y; vdgJ ,U e‍h; %yf‍$Wfs; ,i zeJ madp‍f isr; Nj‍hw‍Wtp‍f‍Fk; ep‍fo;tjhk; Fk; ,eep‍foj‍p‍d; NghJ xU e‍h; %yf‍$w‍p‍p‍Ue:J xU GNuhl‍l‍hd; kw‍nwhU e‍h; %yf‍$WfF‍ khww‍g‍gl‍L> i ` l‍uhfi ]L madp‍fs; cUthp‍dwd. GNuhl‍l‍hd; kw‍nwhU e‍h; %yf‍$Wld; NrheJ i ` lNuhdp‍ak‍ madp‍ahf f‍bf‍fz‍l l‍thW cUthfp‍wJ.

$$H_2O_{(l)} + H_2O_{(l)} \rightleftharpoons H_3O^+_{(aq)} + OH^-_{(aq)}$$

$$2H_2O \qquad H_3O^+ \qquad OH^-$$

,t‍thW cUthFk; i ` lNuhdp‍ak; madp‍ xU ty‍pi kahd mkp‍yk; MFk; i ` l‍uhfrp‍y; madp‍ xU ty‍pi kahd fhuk; MFk; vdNt mi t cUthdTl d; kl‍z Lk; ,i zeJ e‍l‍uj; jUfp‍dwd. ,J xU kl‍‍S; tp‍dahFk; NkYk; ,t‍tp‍d tp‍i utp‍y; rkep‍i yi a mi lfp‍wJ. vdNt cUthd madp‍f‍sp‍d; nrwp‍T kp‍ff‍ Fi wthFk; ,ej i ` l‍uhfrp‍y; kwWk; i ` lNuhdp‍ak; madp‍ad; nrwp‍Tfsp‍d; ngUf‍F‍j; njhi fNa e‍h; madp‍gngUf‍fk; vdgg‍lLfp‍wJ. ,J vdwi of‍ggl‍Lfp‍wJ. ,J K_w fz‍j‍pr; rkdghl‍l‍hf fbf‍fzl‍l l‍thW Fw‍pf‍ggl‍Lfp‍wJ.

$$K_w = [H_3O^+][OH^-]$$

$[H_3O^+]$ l vsp‍i kahf $[H^+]$ vd vOj‍yhk; vdNt e‍hpd; madp‍gngUf‍f‍jij‍j vd vOj‍yhk;
,jd; myF Nkhy‍^{2} nl r‍pk‍^{6}25°C , jd; kjpp‍gG 1.00 × 10^{-14}

pH msTNfhy;

e‍hpd; Ra madp‍ahj‍y; gz‍g‍pdhy; vyyh e‍l‍ff‍p‍ ury‍fS‍k; i ` lu[d; kwWk; i ` l‍uhfrp‍y; madp‍f‍l sf‍ nfhz‍l bUf‍Fk; ,jd‍ld; e‍h‍py; fi uf‍f‍ggLk; Nrh‍kqf‍Sk; madp‍ahj YfFlgl‍l i ` lu[d; myyJ i ` l‍uhfrp‍y; madp‍f‍l sj; juyhk; ,ej madp‍fsp‍d; nrwp‍T xU fi uryp‍d; mkp‍yjj‍dk‍ myyJ fhujj‍dk‍i a jhkhdp‍f‍fp‍wJ.

pH msTNfhy; xU fi urypd; i ` lu[d; madpf; nrwpi t msff cjTk; xU mstll hFk;

pH vdw Fwpall by; 'p' vdgJ 'potensz' vdw n[hkdpar; nrhyi yf; Fwpf;Fk; ,jd; nghUs; Power vdgjhFk; ,J nl dkhhf; ehl;i lr; Nrhej c aphp Ntjpapay; tpQ;Qhdp S.P.L. rhudrd;

vdgtuhy; 1909 Mk; Mz;L Kdnkhpagglji;J. pH mstL vdgJ 0 Kjy; 14 Kba css vz;fi sf; nfhz;l mstll hFk; ,J xU fi ury; mkpyyh? fhukh? myyJ eLepi yjjdk k thaejjh vd Fwpggpl cjTfpwJ.

· mkpyqfspd; pH kjpgG 7 I tpl FiwT
· fhuqfspd; pH kjpgG I tpl mjpfk;
· eLepi yf; fi urypd; pH kjpgG 7f;F rkk;

pH vdgij i ` lu[d; madpr; nrwpttpd; gjij mbggi lahff; nfhz;l klfi fapd; vjhp kjpgghFk;

$$pH = -\log_{10}[H+].$$

rpy nghUs;fspd; pH kjpgG fbfz;l ml;l ti z apy; juggl LssJ.

	nghJthd mkpyqfs;	pH	nghJthd fhuqfs;	
1.	HCl (4%)	0	,ujj gpsh]kh	7.4
2.	tapwwpy; (,iugig) css mkpyk;	1	Klil ntsispffU	8.
3.	vYkphri r rhW	2	fliy ePh;	8.
4.	tpdpfh; (mrpbf; mkpyk;)	3	ri kay; Nrhlh	9
5.	MuQR gok;	3.5	mkpy ePf;fp	10
6.	Nrhlh eh> jpuhli r	4	mkNkhdpah ePh;	11
7.	Gsjjj ghy;	4.5	Rzz hkG ePh;	12
8.	J}a ghy;	5	tbfhy; Rjjkhf;Fk; nghJs;	13
9.	kdpj dpd; c kpoeh;	6 – 8	vhpNrhlh (4%NaOH)	14
10	J}a ePh;	7	nkfdprpah ghykk;	10
11.	j f;fhspr; rhW	4.2		
12.	fh/gp	5.6		

pH jhi sf; nfhz;L xU fi urypd; pH I vt;thW mstplyhk?
xU fi urypd; pH kjpggpid nghJ epwqfhlb xdwd; cjpphy; fz;lwpa KbAk; ,eepwqfhlb rpy rhaqfspd; fyitahFk; ,J fiuyhfNth myyJ jhs; tbtpNyh gadgLjjgglLfpwJ.

gssp Mat;f mstpyhd pH mstllLf;F pH jhi s gadgLjJtJ xU nghJthd Ki wahFk; xU pH jhs; epwqfhlbfspd; fyi tahy; MdJ. ,J nfhl;ffgglji ,y; Fwpgplll epwji jf; fhl;Lfpw J. epwqfhlbapd; FLi tNahL (ghlbNyhl) xU epw toghlb juggLfpwJ myyJ epwqfhlb elstbt fhfjjjJz;Lfs; juggLjldwd. ,jjhsfs; pH jhsfs; vd miofggglldwd. xU Jsp Nrhji r fi ury; nghJ epwqfhlbAld; Nrhffgglll myyJ pH jhspy; itffgglll epwqqlbaYld; njhlhGgLjjp pH kjpgG fz;lwpaggLfpwJ ,t;thW fz;lwpaggLk;

kj]gGfs; Nj[huhakhd kj]gGfNs MFk; nghJthf kd]j ujjjjpd; pH kj]gG 7.4 MFk;

mdwhl tho;tpd; pH d;gq;F:

jhtuq;fS k> tpyq;FfS k; pH rhhej cz h;Tssi tah?
ekJ clyhdJ 7.0 Kjy; 7.8 tiu css pH vyi y rhheJ Ntiy nraf]wJ. cahpdqfs; xU FWfpa vyi yfFs; klLNk cah; tho ,aYk; ek; clypy css jutqfs; ntttNtW pH kj]gGfisf; nfhz;lit. vLj;Jf;flhf kdj ujjjjpd; pH kj]gG 7.35 ypUeJ 7.45 MFk; ,ej kj]ggpypUeJ Fi wejhNyh myyJ mjpfhpjjhNyh> mJ Nehia cz;lhfFk;

kdj nrhpkhd kz;lyjjpy; pH kj]gG:
ekJ ,iugig i` lNuhFNshhpf; mkpyjij RufpwJ vdgJ xU tpagGHLk; nrajpahFk; ,ej mkpyk; ,iugigia ghjpffhky; cz i tr; nrhpff cjTfpwJ. rhphd nrhpkhdk; ,yyhjNghJ ,iugigahdJ $Ljyhd mkpyjijr; RueJ typi aAk> vhprri yAk; VwgLjJfpwJ. ,iugigapy; css jutjjd; Njhuhakhd pH kj]gG 2.0 MFk;

pH khwwk; - gwrpi jTfFf; fhuz k;
kdj ckpoehpd; pH kj]gG 6.5 – 7.5 tiu cssJ. ekJ gwfspd; NkwgugG glykhdJ fyhpak; gh]Ngl; vdw kpff; fbdkhd nghUspdhy; MdJ. Vnddpy; ckpo ehpdpH 5.5 fFk; fNo FiwAknghOJ gwfspd; NkwgugG glyk; (vdhky) ghjpffggLfpwJ. ,J gwrpi jT vdggLfpwJ. nghJthf ehk; gadgLjJgglk; gwgi rfs; fhujjdik nfhz;lit. ,it $Ljy; mkpyjjdikia eLepi yahffk; nrajJ gwrpi ji tj;jLffpwwd.

kz z pd; pH
tptrhajjpwF kz z pd; pH kpf Kffpaj;Jtk; thaejJ. rplhpf; mkpyk; nfhz l goqfs; rwW fhujjdik css kz z pYk> ney; mkpyjjdik nfhz l kz z pYk> fUkG eLepi yjjdik nfhz l kz z pYk; tsUk;

ki o ehpd; pH
ki o ehpd; pH kj]gG VwfFiwa 7 MFk; ,J> ki oePi eLepi yjjdi kahdJ kwWk; J}ai kahdJ vdgi jf; FwpffpwJ. tspkz lyf; fhwW rygh; il Mfirl> ielu[d; Mfi rfs; Mfpa thAffshy; khRgLk; nghOJ mi t ki oehpy; fiue;J pH kj]gpg 7 I tpl; Fi war; nrafpwwd. ,tthW ki oehpd; pH 7 I tpl Fi wAk; nghOJ mkki o mkpyki o vdggLfpwJ. ,ej mkpyki o eh; MWfspy; Nruk; nghOJ mtwwpd; pH I Fi wffpwwd. ,jdhy; eh;tho cahpfspd; tho;T ghjpffggLfpwJ.

fz fpLfs;
pH vdgJ i` lu[d; madp nrwtpd; gjij mbggi lahjf; nfhz l klfi fapd; vjph; kj]gghFk;
        pH = -log₁₀ (H⁺)
v.fh: 0.01 M HNO₃fi uryd; pH kj]gG fhz f.
jhT:
        (H+) = 0.01
        pH = -log₁₀(H⁺)
        pH = -log₁₀ (0.01)
        pH = -log₁₀ (0× 10⁻²)
        pH = -(log₁₀ 1-2 log₁₀10)

$$pH = 0 + 2 \times log10_{10}$$
$$pH = 0 + 2 \times 1 = 2$$
$$pH = 2$$

pOH vdgJ i` luhfrpy; madpr; nrwptpd; gjij mbggi lahf nfhz;l kl qi fapd; vjh; kjpgghFk;

$$pOH = -log_{10}(OH^-)$$

v.fh: xU fi urypd; i` luhfrpy; madp nrwpT 1×10^{-9} M vdpy; mf;fi urypd; POH kjpgG vd;d?

$$pOH = -log_{10} (OH^-)$$
$$pOH = -log_{10} (1 \times 10^{-9})$$
$$pOH = -(log_{10} 1.0 + log_{10}10^{-9})$$
$$pOH = -(0 - 9 \, log_{10}10)$$
$$pOH = -(0 - 9)$$
$$pOH = 9$$

pH kwWk; pOH f;F css njhlhl;hG

xU ePf;fi urypd; pH kwWk; pOH- f;F ,ilNaahd njhlhhig fbffz;l rkdghl;bd; %yk; mwpayhk;;

$$pH + pOH = 14$$

fi urypd; pH kwWk; pOH y; VNjDk; xU kjpgG njhpejhy; kwnwhdiw vspjhf fz ffpl yhk;

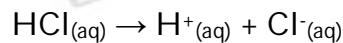v.fh. xU fi urypd; pOH kjpgG 11.76 vdpy; mf;fi urypd; pH kjpgG fhz;f.

$$pH = 14 - pOH$$
$$pH = 14 - 11.76 = 2.24$$

fz fFfs;
v.fh: 1
0.001 M nrwpTss i` lNuh FNshhpf; mkpyjjpd; fi urypd; pH kjpgig fhz;f.
jhT:
HCl vdgJ typik kpFej mkpyk; vdgjhy; KOtJk; madpahf khWk; fbfz l thW.

$$HCl_{(aq)} \rightarrow H^+_{(aq)} + Cl^-_{(aq)}$$

Nkwfz;l nraypy; xU Nkhy; HCl xU Nkhy; H^+madpfis jUk; Mi fahy; H^+madpapd; nrwpthdJ i` lNuh FNshhpf; (HCl) mkpy nrwpTf;F rkk; (0.001 M myyJ 1.0×10^{-3}Nky; yp^{-1})

$$pH = -log_{10}(H^+) = -log_{10}10^{-3}$$
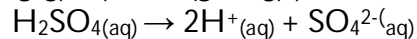$$= -(-3 \times log_{10}10)$$
$$= -(-3 \times 1) = 3$$
$$pH = 3$$

v.fh: 2
5×10^{-5}Nkhy;$^{-1}$ nrwpT nfhz;l ePhjj rygpAhpf; mkpyjjpd; pH kjpgG vd;d?
jhT:
ePhpy> rygpAhpf; mkpyk; gphpAk; Ki w
$$H_2SO_{4(aq)} \rightarrow 2H^+_{(aq)} + SO_4^{2-}{}_{(aq)}$$

fi urypy; xtnthU Nkhy; rygpAhpf; mkpyk;> ,uz;L Nkhy; H^+madpfis jUk; xU yp$l$h; H_2SO_4fi urypy; 5×10^{-5}Nkhy; H_2SO_4, Uf;Fk; $2 \times 5 \times 10^{-5} = 10 \times 10^{-5}$myyJ H^+madpfis xU yp$l$hhy; 1.0×10^{-4}Nkhy;

$(H^+) = 1.0 \times 10^{-4}$Nkhy; yp$l$h;$^{-1}$

$$pH = -log_{10} (H+)$$

$$= -\log_{10}10^{-4}$$
$$= -(-4 \times \log_{10}10)$$
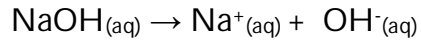$$= -(-4 \times 1) = 4$$

pH = 4

v.fh: 3

1×10^{-4}Nkhy; NaOH fi urypy; css pH kj;pgi g fhz ;f.

jh;T:

NaOH vdgJ typi kahd fhuk; kwWk; mf;fi uri y fb;fz ;thW ghpi f mi l fpwJ.

$$NaOH_{(aq)} \rightarrow Na^+_{(aq)} + OH^-_{(aq)}$$

xU Nkhy; NaOH MdJ xUNkhy; OH^+ madpfi s ,jpy;pUe;J jUk;

$$(OH^-) = 1 \times 10^{-4}Nky; ypl ;l h;^{-1}$$
$$pOH = -\log_{10}(OH^-)$$
$$= -\log_{10}(10^{-4})$$
$$= -(-4 \times \log_{10}10)$$
$$= -(-4) = 4$$
$$pH + POH = 14$$
$$pH = 14 - POH$$
$$= 14 - 4$$
$$= 10$$

v.fh: 4

xU fi urypd; i ` l u[d; madpapd; nrwpT 1×10^{-8}Nky; ypl vdpy; mff;i urypd; pH kj;pgi g fhz ;f.

jh;T:

,q;F ehjj fi urhf css;jhy; nfhLf;ff;gglLss nrwpthdJ mkpyjj j;Nah> fhujj j;Nah FwggJ ,yi y. Mdhy; madpfi s Fwpf;Fk; vdNt fb;fz ;thW fz ;ffpl yhk;

$$pH = -\log_{10}[H^+]$$
$$[H+] = 1.0 \times 10^{-8}Nkhy; ypl ;l h;^{-1}$$
$$pH = -\log_{10}[10^{-8}]$$
$$= -(-8 \times \log_{10}10)$$
$$= -(-8 \times 1) = 8$$

v.fh: 5

xU fi urypd; pH kj;pgg 4.5 vdpy; pOH kj;pgi g fhz ;f.

jh;T

$$pH + pOH = 14$$
$$pOH = 14 - pH$$
$$pOH = 14 - 4.5 = 9.5$$
$$pOH = 9.5$$

epi dt;py; nfhshs;f:

· Ntjp khwwk; vdgJ xdW myyJ mjw;F Nkwgll Gjpa nghUs;fs; cUthfFk; xU khwwkhFk;;

· ngUkghyhd Nrhf;fpf f tpi dfs; ntgg ckpo; tpi dfNs MFk;

- vy;yh xspu;rpi jT tpi dfs; ntggf; nfhs;tpi dfs; MFk;

- ,ul;i l ,lgngahrurp gu] gu madpfs; ghpkhw;wj;jpdhy; epfof;fpdwd.

- tbgbT tpi dfs; fi uahj c ggpi d tpi snghUshf jUfpdwd.

- eLepi yahf;f tpi d vdgJ xU mkpyKk> fhuKk; Nrhe;J c gi gAk> el; uAk; jUk; tpi dahFk;

- eLepi yahf;fy; tpi dahy; gw;rpi jT jLf;fggLfpwJ.

- ngUkghyhd Ntjptpi dfs; klsh tpi dfshFk;

- Ntjpu; rkepi y – KdNdhf;F tpi dapd; NtfKk> gpdNdhf;F tpi dapd; NtfKk; rkkhf c s;s epi y.

- ntggepi y> Ntjp tpi dapd; Ntfjij mjpfhpf;fpwJ.

- xU %ba mi kggpy; rkepi y ei lngw ,aYk;

- mOjjk; xU Ntjptpi dapd; Ntfjij mjpfhpf;fpwJ.

- ek; mdwhl thof;i fapy; pH Kf;fpa gq;F tfpf;fpwJ.
- kdpjhfspy; mi djJ c app Ntjptpi dfSf;F pH kjpgG 7 – 7.8 f;F ,i lNa ei lngWk;

- ki oehpd; pH kjpgG 5.6 f;F fb; nryYk; NghJ mJ mkpy ki o vdggLk;

- J}a eh; xU typi k Fi wej kpd; gFspahFk;