रसायन शास्त्र
कक्षा 12वीं

समय 3 घंटे **अधिकतम अंक 75+25 प्रायो.**
सैद्धांतिक 75

इकाई	इकाई का नाम	निर्धारित अंक	कालखंड
1.	ठोस प्रावस्था	04	08
2.	विलयन	06	12
3.	विद्युत रसायन	06	12
4.	रासायनिक बलगतिकी	05	10
5.	सतह रसायन	04	10
6.	कुछ धातुओं का निष्कर्षण एवं उनके प्रमुख यौगिकों का अध्ययन	05	15
7.	p ब्लाक के तत्व I	05	10
8.	p ब्लाक के तत्व II	05	10
9.	d एवं f ब्लाक के तत्व	06	12
10.	उपसहसंयोजी रसायन	04	10
11.	हेलो अल्केन एवं हेलो एरीन	04	08
12.	अल्कोहन फिनॉल एवं ईथर	04	12
13.	एल्डीहाइड, कीटोन तथा कार्बोक्सिलिक अम्ल	04	12
14.	नाइट्रोजन युक्त कार्बनिक यौगिक	03	09
15.	जैव अणु	05	15
16.	I दैनिक जीवन में रसायन II भारत के प्राचीन वैज्ञानिक एवं वैज्ञानिक संस्थान	05	15
	पुनरावृत्ति		20
	योग	**75**	**200**

bd kbZ&ksj d fBu fo"k; oLrq ds fu/kkZj.k

Chemistry–XII

Unit-1 Bksl i`FkDLFkk %**Solid State**

f} foeh; ,oaf=foeh; fØLVy kaesabdkbZ lsy dh lajpuk,a bdkbZ lSy dh ?kuRo x.kuk ,dd lSy eaij ek.kqvksa dh la[;k dk fu/kkZj.k] fofHkUu idkj dh Bksl ksaesai Sfdax ¼ladqyu½ fjfDr;kW (Voids), Bksl ksad sfo|qrh;] pqEcdh; xq.kA

Structures: Of unit cell in latices of Two and Three diamentional Crystals. Density of unit cells determination. Different types of packings in solids. Voids in solids. Electrical and Magnetic properties of solids.

Unit-2 foy;u %**Solutions**

foy;ukasd h lkanzrk O;Dr djukA Bksl ksad snzoksaesafoy;uA Bksl fey kusi j ok"i nkc eavkis{kd voueuA DoFkukad eamUu;u vkSj nzo.kkad ;kfgekad dk voueuA v.kq nzO;ekukasd h x.kukA vlkekU; v.kqnzO;ekuA

Expression of concentrations of solutions. Solutions of solids in liquids. Relative lowering of vapour presser, Elevation of Boiling Point., depression in freezing point. Determination of molecular masses. Abnormal molecular mass.

Unit-3 fo|qr jlk;u %**Electro Chemistry**

foy;ukaesapkydrk] fof'k"B ,oav kf.od pkydrkA fdlh lSy dk fo|qr okgd cy] ekud byDVªkM foHkoA uLVZl ehdj.k rFkk bldsmi;ksx ¼uqiz;ksx½ bZa/ku lSyA

Conductivity in solutions, specific and molecular conductivity, EMF of a cell, Standard electrode potential, Nernst equation and its applications to chemical cell, Fuel cells.

Unit-4 jklk;fud cyxfrdh % (Chemical Kinetics)

rkRdkfyd ,oavkSr vfHkfØ;k nj rFkk blsi zHkkfor djusokysdkjdA fdlh vfHkfØ;k dh vkf.odrk ,oadksfV] fof'k"V nj fLFkjkadA 'kwU; ,oaiFke dksfV jklk;fud vfHkfØ;kvksad sfy;sv/kZvk;qA nj fLFkjkad dh rki ij fuHkZjrk] vkjgsfu;l lehdj.kA lfØ;.k Åtk Z,oan{kgh Åtk ZA

Instantanious and Average rate of a chemical reation and Factors affecting rate of a chemical reaction, Order and molecularity of a reaction, specific rate constant, Half life for zero and first order reaction, Temperature dependence of

rate constant, Arrhenius equation, Activation Energy & Threshold Energy.

Unit-5 lrg jlk;u % (Surface Chemistry)

Bksl ksa}kjk xSlksa dk vf/k'kks"k.k dks izHkkfor djus okys dkjd] ilana ij vk/kkfjr fØ;k'khyrk ¼fØ;rk,oa oj.k{kerk½, Utkbe mRizsjd] cgqv.kq] rFkk lajpukRed v.kqvksa dk fy y foy;u@ik;l ,oa budk izdkj@

Adsorption of gases by solids and factors affecting it. Activity and selectivity. Enzyme catalysis, Emulsions and its types.

Unit-6 /kkrqvksa ds fu"d"kZk rFkk muds iz;qDr ;kSfxdksa dk v/;;u (Extraction of some Metals and study of Their important compounds)

Al, Cu, Zn, Fe, rFkk Ag ds L=ksr@fu"d"kZk ds fl)kar@ $CuSO_4$, $AgNO_3$ rFkk HgX dscukus dh fof/k; kSfxd qk ,oami;ksx@LVhy] QksVksxzkQh

Occurrence and principles of Extraction of metals, Al, Cu, Zn, Fe and Ag. Preparation Properties and uses of $CuSO_4$, $AgNO_3$ and HgX. Steel, Photography.

Unit-7 *P*-CykWd rRo (P-Block Elements)

lewg 15 dsrRo & $(N^{7}-P^{15}-As^{37}-sb^{51}-Bi^{83})$

byDVªkfud foU;kl] ikfIr LFkku] vkDlhdj.k voLFkk,a@xq.kksaesaØfedrk@ukbVªkstu vkDlkbMksa dh lajpukA QkLQksjl ds;kSfxd@ PCl_5 dh Hkkafr NCl_5 dk ugh cuus dk dkj.kA

lewg 16 dsrRo & $(O^{8}-S^{8}-Se^{34}-Te^{52}-Po^{84})$

byDVªkfud foU;kl] ikfIr LFkku] vkDlhdj.k voLFkk,a@ xq.kksaesaØfedrk@lYQj dsvkDlksvEyksa dh lajpuk H_2O nzo rFkk H_2S xSl gksusdk dkj.kA

Group-15 Elements

Their electronic configuration, occurrence, oxidation states. Trends in properties, Structure of Nitrogen Oxides, Compounds of Phosphorous, Reason of Not Forming NCl_5 like PCl_5.

Group-16 Elements

Electronic configuration, occurrence, oxidation states. Trends in properties. Structure of Oxo-Acids of Sulphur, Reason for being H_2S as gas and H_2O as Liquid.

Unit-8 *P*-CykWd dsrRo (Element of P-Block)

lewg 17 dsrRo & (F - Cl- Br- I- At)

by\SDVªkfud foU;kl] vkDlhdj.k voLFkk,¡] izkfIr LFkku] xq.kkaesaØfedrkA bUVj gSyks u ;kSfxd rFkk budscuusdsdkj.kA

Electronic configuration, Oxidation states, Occurrence trends in Properties, Inter halogen compounds and reason for their formation.

lewg 18 dsrRo & $(He^{2} - Ne^{10} - Ar^{18} - Kr^{36} - xe^{54} - Rn^{86})$

by\SDVªkfud foU;kl] izkfIr LFkku] xq.kkaesaØfedrk] tsuu ¶yksjkbMÓ

(Electronic configuration, occurrence, trends in properties, fluorides of xenon).

Unit-9 *d*– rFkk *f*– CykWd dsrRo (*d* and *f* Block Elements)

¼lewg&3 ls12 dsrRo rFkk yS.FksukbMÓ ,oa, DVhukbMÓ½

by\SDVªkfud foU;kl] izkfIr LFkku] lØe.k ¼VªkathlkU½/kkrqvksadhfo'ks"krk,¡] iFke iafDr dslØe.krRoksadsxq.kkaesalkekU; ØfedrkA ?kkfRod xq.k] vk;kuhdj.k ÅtkZ] ,UFkSYih] vkDlhdj.kvoLFkk,¡] vk;fud f=T;k,¡] jax] mRizsjdh; xq.k] pqEcdh; xq.k] vUrjkdk'kh; ;kSfxd] feJ /kkrqfuekZ.kA

yS.FksukbMÓ & by\SDVªkfud foU;kl] vkDlhdj.k voLFkk,¡] jklk;fud fØ;k'khyrk] yS.FksukbM~ ladqpuA

,DVhukbMÓ & by\SDVªkfud foU;kl] vkDlhdj.k voLFkk,¡A

(Group 3 to 12 elements, Lanthanides and Actinides)

Electronic configuration, occurrence, characterstics of Transitional metals, general trends in first row Transitional elements (metallic properties, Ionization enthalpy, oxidation states, Ionic Radie, colour, catalytic properties, magnetic properties, interstitial compounds, Alloy's formation.

Lanthnides- Electronic configuration, Oxidation states, Chemical reactivity, Lanthanide contraction.

Actinides- Electronic configuration, oxidation states.

Unit-10 mil g&lagks hjlk;u (Co-ordination Chemistry)

laXuh ¼layXu½ mil gl agks h lè;k] jax] pqEcdh; xqk ,oavkd`fr;k] ,d&ukfHkdh; mil gl agks h;kSfxdksadk IUPAC ukedj.k] vkca/ku] leko;ork] bu ;kSfxdksadk egRo@¼xqkkRed fo'ys"k.k] ?kkfRod 'kks/ku vkSj tSfod iz.kkfy;ksa dk Z ?kkfRod ;kSfxdA

(Co-ordination Compounds)— Ligands,

Co-ordination number, colour, magnetic properties and shapes. IUPAC Nomenclature of mono-nuclear co-ordination compounds, Bonding, Isomerism, Importance of co-ordination compounds (In qualitative analysis, extraction of metals and Biological systems), Organo metallic compounds.

Unit-11 g\$ks,Ydsu rFkk g\$ksjhu

g\$ksYdsu & ukedj.k] C-X cU/k dh izd`fr] HkkSfrd ,oa jklk;fud xq.k] izfrLFkkiu fØ;kvksa dh fØ;kfof/kA

g\$ksjhu & ukedj.k] C-X cU/k dh izd`fr] izfrLFkkiu fØ;k,a rFkk ,dy izfrLFkkiu ;kSfxdksa esa g\$ksts uksa dk funsZ'kd izHkkoA MkbZDyksjks feFksu] VªkbZDyksjks feFksu rFkk VsVªkDyksjks feFksu] vk;ksMksQkeZ] Ý hvksu] DDT, rFkk BHC ds i;kZoj.kh; izHkkoA

Halo Alkanes– Nature of C-X bond, physical and chemical properties, mechanism of substitution reactions.

Haloarenes– Nomenclature, Nature of C–X bond, substitution reactions and directive influence of halogen for mono substituted compounds only. environmental effects of dichloromethane, tri chloromethane & Tetra Chloromethane, Idoform, Freons, DDT, BHC.

bdkbZ&12 ,Ydksgy fQuky rFkk bZFkj

,Ydksgy & ukedj.k] izkFkfed f}rh;d ,oa r`rh;d vYdksgy dh igpku] futZyhdj.k dh fØ;kfof/kA

fQuky & ukedj.k] vEyh; izd`fr dk dkj.k] byDVªksfQfyd izfrLFkkiu fØ;k,A

bZFkj & ukedj.k

Alcohols, Phenols and Ether's

1. Nomenclature of Alcohols, distinction among Primary, Secondary and Tertiary Alcohols, mechanism of dehydration of Alcohols.
2. Nomenclature of phenols and reason for its Acedic nature, electrophillic substitution reactors.
3. Nomenclature of Ethers.

bdkbZ&13 ,YMhgkbMs dhVksu rFkk dkcksZfDlfyd vEy

vYMhgkbM~ rFkk dhVksu & dkcksZfuy lewg dh izd`fr vYMhgkbMksa esa vYQk gkbMªkstu dh fØ;k'khyrk] U;wfDyvksfQfyd ;ksx'khy fØ;kvksa dh fØ;kfof/kA

dkcksZfDlfyd vEy & ukedj.k] vEyh; izd`fr dk dkj.k]

Aldehydes and Ketones– Nature of –COOH group, reactivity of α-H atom in Aldehydes. Mechanism of Nucleophillic Addition reactions.

Carboxyllic Acids- Nomenclature, Reason for Acidic nature.

bdkbZ&14 ukbVªkstu ;qDr dkcZfud ;kSfxd

ukbVªks;kSfxd & izdkj] egRoiw.kZ jklk;fud fØ;k,a

vehUl & oxhZdj.k] ukedj.k] lajpuk] izkFkfed f}rh;d rFkk r`rh;d vehuksa dh igpkuA

lkbukbMl rFkk vkblkslkbukbMl & jklk;fud vfHkfØ;k,aA

Mk;ktksfu;e yo.k & dkcZfud lay"s.k esa budk egRoA

Organic compounds containing Nitrogen – (Nitro Compounds)
Types, Important chemical properties.

Amines – Classification, Nomenclature, Structure, distinetion of primary, secondary and tertiary Amines.
Cynides and Iso-cynides - Important chemical reactions
Diazonium salts - Importance in Organic syntheses .

bdkbZ&15 ck;ksekWfyD;qYl ¼tSo v.kq½

dkcksZgkbMªsV~l & eksuksls6SdsjkbMl ¼Xyqdkst] ÝDVkst½

vksfylkslSdsjkbMl & ¼lqØkst] ySDVkst] ekYVkst½

ikWfylSdsjkbMl & ¼LVkpZ] lsY;qykst½ egRo

izksVhUl & vYQk] vehuksvEy] vko';d vehuksvEy] isIVkbM cU/k] ikWyhisIVkbMl]

izksVhUl dh izkFkfed f}rh;d] r`rh;d ,oa prqFkZd lajpuk ¼dsoy xq.kkRed Kku½

foVkfeUl & jklk;fud uke ,oa lzksr rFkk oxhZdj.k

U;wfDyd vEy & DNA rFkk RNA

bdkbZ&16 nSfud thou esa jlk;u & vkS"kf/k;ksa esa jlk;u & nnZfuokjd] iz'kkad]

izfrjks/kh] jksxk.kqjks/kh] tho.kquk'kh] moZjrkjks/kh nok,¡] izfrtSfod] vEyrkjks/kh] ,UVh

fgLVsekbUl A

lkcqu rFkk viekTkZd & varj] fØ;kfof/k] dhV izfrd"khZA

Chemistry in Daily life –
Chemicals in medicines - Analgesics, Tranquiligers, Antiseptics, disinfactants, Anti microbials, Antifertility drugs, Anitibiotics, Antacids and Anti Histamines.
Soap and Detergents- Difference, cleanging action, insect repellents.

dfBu vàk i<kusds I Ecák eadN I eqko

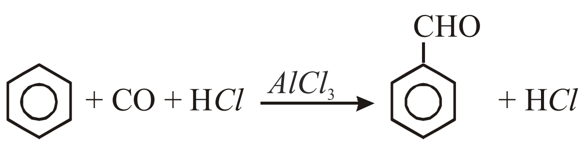
p¶d Nk= gkbZLd wy mRrh.kZgksdj d{kk 11 ohaesat c foKku I ad k; easizos'k y srs gSarc gkbZLdwy Lrj dh foKku dh rqyuk esaikB~;Øe esat ehu vkl eku dk vaj ikdj ?kcjkusy xrsgSa fo'k'kdj jlk; u'kkL= esav f/kd kàkckr aLeÙfr ¼Vuh½esaj[kuhgksrhgS D; kad fo'k'k n'kkv kaeagh fdI hjlk; fud vfHkfØ; k }kjk fo'k'k inkFkkasdk fuekZk I EHko gksrk gSvr %bu n'kkv kadks; kn j[kusdsvfrfjDr vkS dkbZmik; ughgSA ,sh fLFkfr easNk=kadksd{kk 11ohad{kk easizos'k y srsmijka I oZFke vkorZI kj.kh dh oġn pkVZds}kjk I eqy ,oav korZeaxqkkadh I ekurk ,oabu xqkkaeaØferk cr kusdsI kFk ghbudsbyØDVªkfud foU; kl vo'; cryk; stkuspkfg; A bu byØDVªkfud foU; kl ds vk/kkj ij ijek.kqvkdkjkaeao' f) s, p, d, f vkfoZy kadh mi fLFkfr dsvk/kkj ij s, p, d rFkk f Cykd kaesafoHkkt u dksHkyh Hkkfr I e>k; kt kuk pkfg; A mnk- dsfy ; s15 oalegy dsN }kjk ijek.kqvkdkj NkVk gksusdhot g I sdsoy NCl3 ghcurk gSt cfd bl hlegy esavxy srRo P-QkLQkjsl }kjk PCl3 rkscurk ghgS; g vkdkj esaN dh rqyuk esacMk+gksusdsdkj.k PCl5 Hkhvkl kuhI scuk y srk gSA nwljkdkj.k P dsikl d&d{kd dhmi fLFkfr Hkhcry kbZt kuk pkfg; A bl fjDr d&vkjfoVy dksS vkjfoVy I sbyØDVªkWfey usij 5 vk; ¤Fer byØDVªkWikIr gksrk gSA 16 oalegy esaO rFkk S ds xqkkaesaHkh Øfed vaj vkrk gSH dsI kFk O t y ¼H2O½cukrk gSvkS S ¼xU/kd½H dsI kFk H2S cukrk gSA H2O ¼t y ½nzo voLFkk esagksrk gSi jUrqmUghan'kkv kaesaH2S xSl gksrhgSA dkj.k O dk ijek.kqvkdkj S dhrqyuk esaNkVk gksrk Li "V djNk=kaesa fo"k; dsifr :fp iSnk dht kusdk izkl gksuk pkfg; A vkdkj NkVk gksusij HcU/k vkl kuhI scuuk nzo voLFkk dsfy ; sft Eesnkj gkst krk gSA S dk cMk+vkdkj gksusls H cU/k ughcu ikrk rFkk v.kqnzw&nzw jgusdsdkj.k vkiI hvkd"kZcy de gkst kus ls; g xSl :i y sy srsgSA

vkorZI kj.kh dsrRokadsbyØDVªkfud foU; kl I e>krsle; d{kdkaeav /kZfjr rFkk iwkZ: i I sHkjsgq byØDVªkukadsLFkkf; Ro dsckjseaHkhfo'k'k: i I sNk=kadk /; ku vkdf"kZ fd; kt kuk pkfg; A I Øe.k rRokadsckjseasd&d{kd dsbyØDVªkukadkÅ tkZ ikusij vU; vxy sd{kdkaeaizos'k gksusdsdkj.k i fjorhZI a;kstdrk n'kkZusI aca/khdkj.k

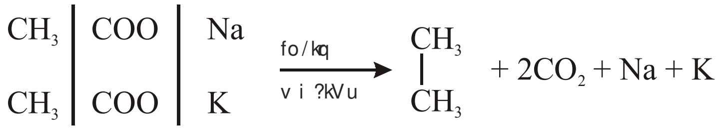
Hkh Li"V fd ;k tkuk pkfg;s I kFk gh v/kZifjr d{kd gksus ij LFkkf;Ro x`.kd j ys s d sdkj.kbu rRoks} kjk I å;kes a d bl de i fjorh Z ,aks d rk,an'kkZ s dk d kj.k I e>k;k tk I drk g\$A

dkcZu d jIk;u dksvkjaHk d jrs I e; C d h C d s I kFk Hkh v f/kd cU/kqk gks s I sy Ech&y Ech J\`a[kyk okys vkjS [kqyh rFkk cna J\`a[kyk okys ;kSxd ka dk fuekZk d j I okZ/kd ;kSxd ka dk cukuk ,d dkj.k g\$A bl sNk= ka dks Li"V :i I s I e>k;k tk,A

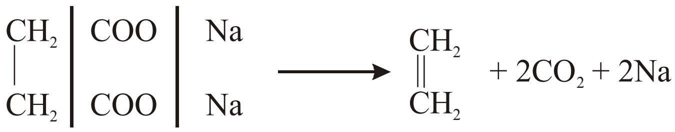
tc dkcZu d jIk;u i<k;k tk; rc bl d se/; ea kat Ss;kSxd ka es C d h I \`a;k c<kuk] ?kVkuk] ,Yd sukaes $–OH, –CHO, –COOH, –NH_2, –CO.NH_2, –CN , –N≡C$ vkjS $NO_2, –HSO_3$ vkfn I eqgka dksykusfo"k; d I keku; fØ;kvksal s vo xr djkusdk vH;kl djk;k tk; sr ksNk= jIk;u d sI keku; inkFkksal s i fjfpr gksdj i z\`fk :i I s i f Nsr tkusokys egRoi w.kZ i fjorZ ukadks i w.kZ d j use a vkRe fo'okl yk I d rs s vkjS bl I s dkcZu d jIk;u jkspd cus xhA ,sls gh d bl i Ø ekaes a i z;Dr inkFkkZsd s} kjk fØ;k,al EHko gk\$ ft u jIk;u Kkus; sn'kk,aK kr d h mud s uke I smu i Ø ekad ks tkukt kusy x kmnk- Pd r Fkk $BaSO_4$ d h mi fLFkfr esa H_2 d s} kjk fd ;k x;k vip;u **jkst ueqM v fHkfØ ;k]** KOH r Fkk Br_2 } kjk& $CO–NH_2$ I eqg d k $–NH_2$ I eqg esa i fjorZu **gkQeSu cksekbM** v fHkfØ ;k] vey xSSVM ft a d r Fkk I kUnz HCl } kjk i kIr $H–H$ I s $>C=O$ I eqg d ks CH_3 esa i fjofrZ djuk **Dy heSlu vip;u**] fut ZY $AlCl_3$ d h mi fLFkfr esa cSat hu fjax esa ,Yd kby vFkok ,I kby I eqg d ki zos'k djkuk **ÝhMy ØkÝV v fHkfØ ;k** d suke I st kuht krh gS bl fof/k } kjk mRi k gksbMªks cZu ka dk fuekZk fd ;k tk I drk g\$A bl hi ed kj cSat hu fjax I st qMªh iK'Z J\`a[kyk d k v kdkj d vkDI hdj.k bVkMZ v fHkfØ ;k dgykr k g\$A Zn /kkrq d h mi fLFkfr esa nks ,Yd kby gSykbMksa d s I eqgksa d ks I a;ks d jk mRi I ak r gkbMªks kcZ cukuk **Ýdy sM v fHkfØ ;k** d gyk;k A ÝhMy ØkÝV v fHkfØ ;k d k foLrkj d jrs gq **xSVjeS&d kp** us $AlCl_3$ d h mi fLFkfr esa cSat hu fjax esa $–CHO$ I eqg t ksM+fn;k bl s xSVjeS&d kp v fHkfØ ;k d suke I st kuk x ;kA mnk-



dkWcsusd kcZu d vEy ksad sl ksM; e vFkok i ksVsf'k; e y o.kksad st y h; foy ; u d k fo|qr vi ?kVu d j l arIr vFkok vl arIr l arr gkbMªksd kcZuksad k l aày sš.k l aHko cuk; k bl fy ; s ml h d suke i j bl s **d kWcsl aày sš.k** d gk t kusy xkA mnk-



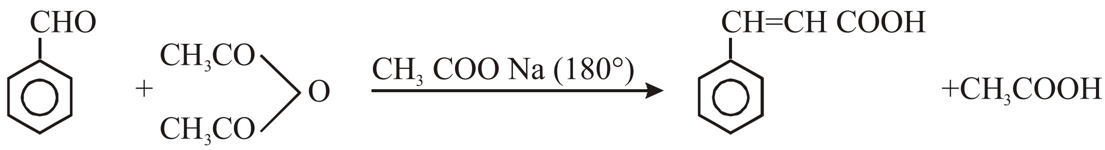
t y h; foy ; u



t y h; foy ; u

t y h; foy ; u gksusl s K, Na /kkrq fØ; kd j KOH ; k $NaOH$ d k fuekZk d j y srs gSA

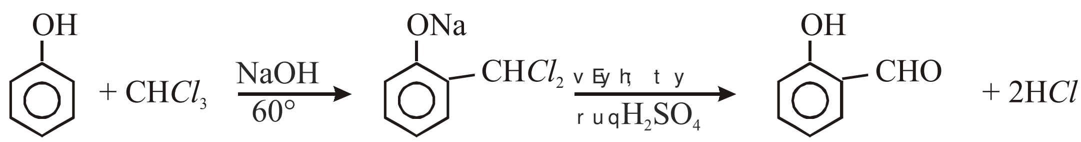
fd l h ,jksesfVd vYMhgkbM d h fd l h ,fyQsfVd vEy ,ugkbMªkbM l sft l eanks vYQk gkbMªkst u i jek.kqgksagkaml h ,ygQsfVd vEy d sl ksM; e y o.k d h mifLFkfr eavfHkfØ; k d jkusi j vl arIr vEy i kIr gksrk gSA ; g i zfØ; k i jfd u o}kjk fud kyh x; h Fkh bl fy ; sbl vfHkfØ; k d ks **i jfd u vfHkfØ; k** uke fn; k x; kA mnk-



csUt SYMhgkbM ,ygQsfVd ,ugkbMªkbM ¼,lhfVd ,ugkbMªkbM½ vl arIr vEy ¼fl usfed vEy½

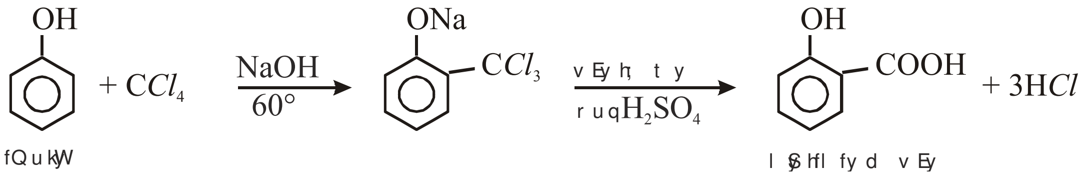
jhej &Vheku

bu jl k; uKksausfQukWy d s{kkjh; foy ; u d h Dy ksjksQkeZ l sfØ; k 60° rki i j djkd si kIr i nkFkZd k vEy h; t y d sl kFk vi ?kVu fd ; k ft l l s§ fyfl y d ,YMhgkbM i kIr gqvkA bl vfHkfØ; k d ksmUgha d suke l st kuk x; k mnk-



fQukWy ¼§ fyfl y ,YMhgkbM½

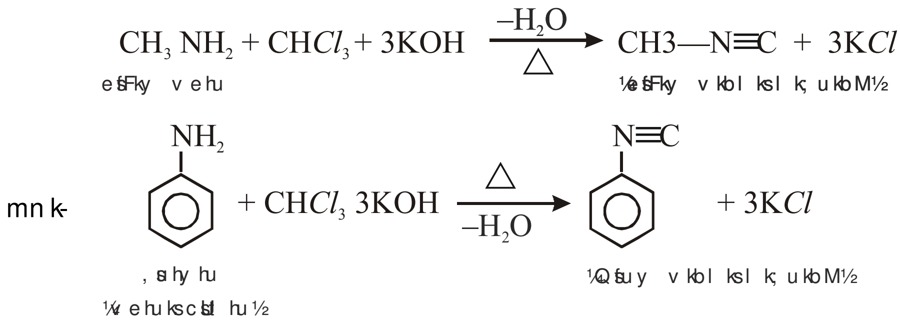
tc DyksjksQkeZ $(CHCl_3)$ dsLFkku ij dkcZu VsVªkDyksjkbM (CCl_4) dk mi;ksx fd;k x;k rc lSgh lSfMhgkbM dsLFkku ij lSfyflfyd vEy izkIr gqvkA



oqVZ }kjk lksfM;e /kkrq ds lkFk ,Ydkby gSykbM~ dk bZFkj; foy;u esa Zfd;k x;k rks mPp ,Ydsu ¼,aYdsu½ izkIr gqvkA bls **oqVZ vfHkfØ;k** uke fn;k x;kA

$$R—X + 2Na + X—R \longrightarrow R—R + 2NaX$$

dqN ,Ssmnkgj.k gSa tks ohfBkfud dsuke lsugh tkustsdj cusi nkFkZ dsuke lstkusts rsgSa mnk- dkcZykby vehu vfHkfØ;kA bl vfHkfØ;k esa ¼Dyksjksa Qkes Z½ dh dqN cwns,uhyhu esafeykdj vYdksgyh KOH ds lkFk xeZ djusij cncwnkj vkblksl kbukbM ¼dkcZykby vehu½ curk gSA dsoy izkFkfed vehu gh ;g vfHkfØ;k n'kkZrsgSa blfy;s izkFkfed vehuksa dh igpku gsrq;g egRoiw.kZ vfHkfØ;k ekuh xbZ gSA



<u>**gSyksQkeZ vfHkfØ;k&**</u>

,Ssvy Ydksgy ftuesa 2C okys $(CH_3—CH$–Hkkx) vFkok nksdkcZu okysdkcksZfuy ;kSfxd $(CH_3–CO$–Hkkx) tc fdlh {kkj dh mifLFkfr esa gSykstuksa (Cl_2, Br_2, I_2) ds lkFk xeZ fd, tkrs gSa rks cuus okys Dyksjksa QkeZ] czkseksQkeZ vFkok vk;ksMksQkeZ lfEefyr :i lsgSyksQkeZ dgs tkrs gSa vkSj bl lkekU; vfHkfØ;k dks gSyksQkeZ vfHkfØ;k dsuke lstkuk tkrk gSA

$CH_3CH_2OH+4Cl_2+6NaOH \longrightarrow CHCl_3+5NaCl+HCOONa+5H_2O$

Dy kjkQkeZ

$CH_3CH_2OH+4I_2+6NaOH \longrightarrow CHI_3+5NaI+HCOONa+5H_2O$

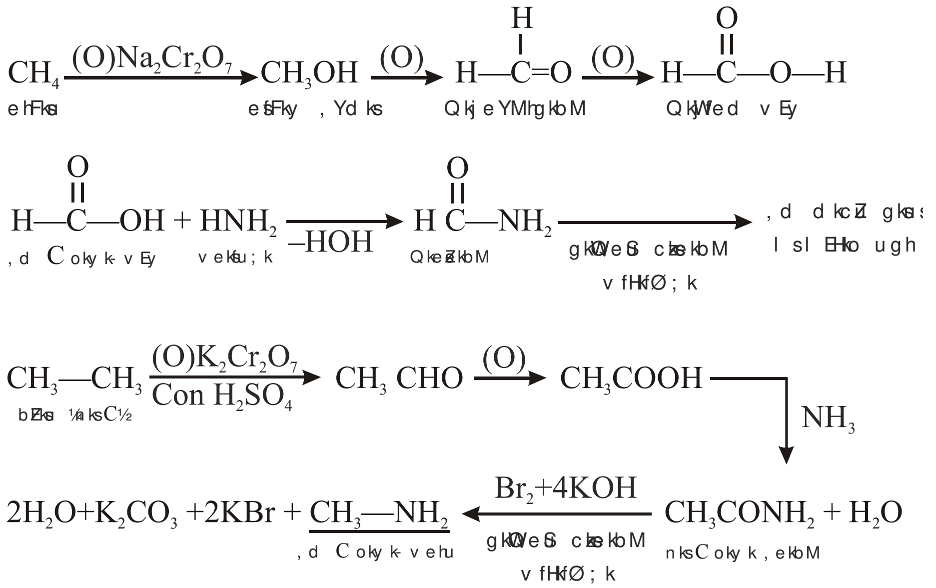
v k; kMkQkeZ

$CH_3CH_2OH+4X_2+6KOH \longrightarrow CHX_3+5KX+HCOOK+5H_2O$

gSy kQkeZ

egRoi wkZ i fjorZu ykus gsrq ; kSfDr ; kW

1- ,d dkcZu okys ,Yds u lsv Yd kgy] v YMhgkbM] dkcksZDlfyd] v Ey] v ehu v kfn cukus gsrq fuEu rduhd v iukbZt k ldrh gSA



gkWQesu czksekbM v fHkfØ; k dsv iukusl scuusokys ; kSfxd esa ,d dkcZu dh deh gkst krh gSvr %t gkWQeSu >CO lew d ksgVkuk gks ; g fØ; k djkbZt k ldrh gSA blsinks esabl i dkj n'kkZ; k t kuk Nk=ksa ds fy, mi; ksxh gksxk

i) $R–CO–NH_2 + Br–Br \longrightarrow R–CO–NHBr + HBr$ (Acid)

ii) $HBr + KOH \longrightarrow KBr + HOH$

iii) $R–CO–NHBr + 3KOH \longrightarrow KBr + K_2CO_3 + \underline{R–NH_2} + H_2O$

$$R–CO–NH_2 + Br_2 + 4KOH \longrightarrow R–NH_2 + 2KBr + K_2CO_3 + 2H_2O$$

2- ; fn –NH2 l eyw d ksv Yd kgy h (–OH) l eyw eacny uk gksr ksbl d sfy ; sea v kDI hd j.k d juk gksk gSv U; Fkk v Yd kgy d sI kFk d Ny ek=k v YMhgkbM d h Hkh cusxhA ea v kDI hd kjd $NaNO_2/HCl$ gSA

$$R–NH_2 \xrightarrow[H_2O]{NaNO_2/HCl} R–OH + NH_3\uparrow$$

$$NH_3 + HCl \longrightarrow NH_4Cl \xrightarrow{NaNO_2} NH_4NO_2 + NaCl$$

3- t c C d h I a; k fd I h ; kSxd eac<kbZt kuh gksr ksfuEu r d uhd v iukbZt k I d rh gSA

$$\underset{\text{(एक C कम वाला अमीन)}}{R–NH_2} \xrightarrow{NaNO_2/HCl} R–OH \xrightarrow{PCl_3} R–Cl \xrightarrow[(Alc.)]{KCN} R–CN \xrightarrow[(H_2)]{Na/Alc.} \underset{\text{(एक C अधिक वाला अमीन)}}{R–CH_2–NH_2}$$

4- d kcZu I a; k c<kusd h nwl jh fof/k oqVZ v fHkfØ; k Hkh gSbl eafd I h , Yd su d s eksuksgSykbM cukd j bZFkj eal ksfM; e d sI kFk ; sgSykbM fey kusi j gSykbMksad snks v .kqfey d j v f/kd d kcZu oky sgkbMªksd kcZu eacny t kr sgSA mnk-

$$R\text{-}(X) + (Na)\ \text{¼bZFkj½} + (X)\text{-}\ R \longrightarrow R–R + 2\ NaX$$

bl fof/k I seHkFksu d k bZFksu eabZFksu d ksi zksu eacny uk v kl ku gkst krk gSA mnk-

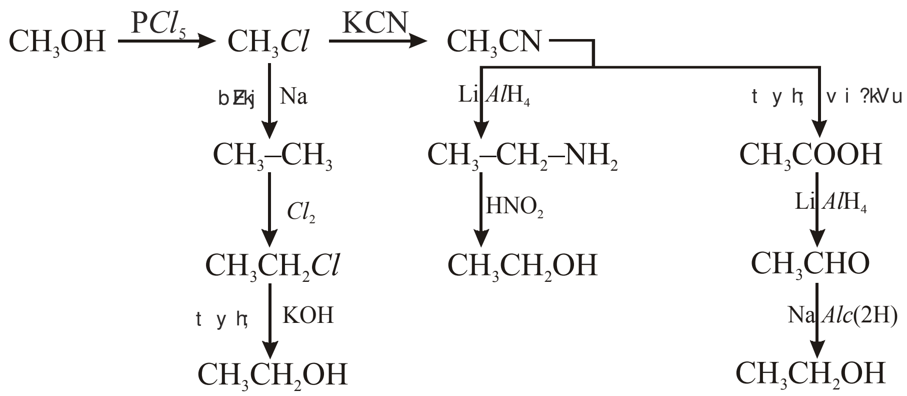
5- t c C d h I a; k fd I h ; kSxd ead e d ht kuh gksr ksi gy sml i nkFkZ I sv ekbM (R-CONH2) cuk uk gksk v kS v ekbM i j gkQeS cksekbM v fHkfØ; k d jkd sbl sR–NH$_2$ ¼v ehu½ eacny fy ; k t k; sxk bl ea, d d kcZu d e jgsxkA v c bl v ehu I s v kxsp kgsv uqd kj v Yd kgy ; k v YMhgkbM ; k v Ey ; k v Ey Dy ksjkbM ; k v Ey , ugkbMªkbM v kfn bPNkuqd kj cuk; st k I d rsgSA

$$CH_4 \xrightarrow{Cl_2} CH_3Cl \xrightarrow[-NaCl]{Na\text{¼bZFkj½}} \underset{\text{¼bZFksu½}}{CH_3–CH_3} \xrightarrow{Cl_2} CH_3CH_2Cl \xrightarrow[+CH_3–Cl]{Na\text{¼bZFkj½}} \underset{\text{i kszsu}}{CH_3–CH_2–CH_3}$$

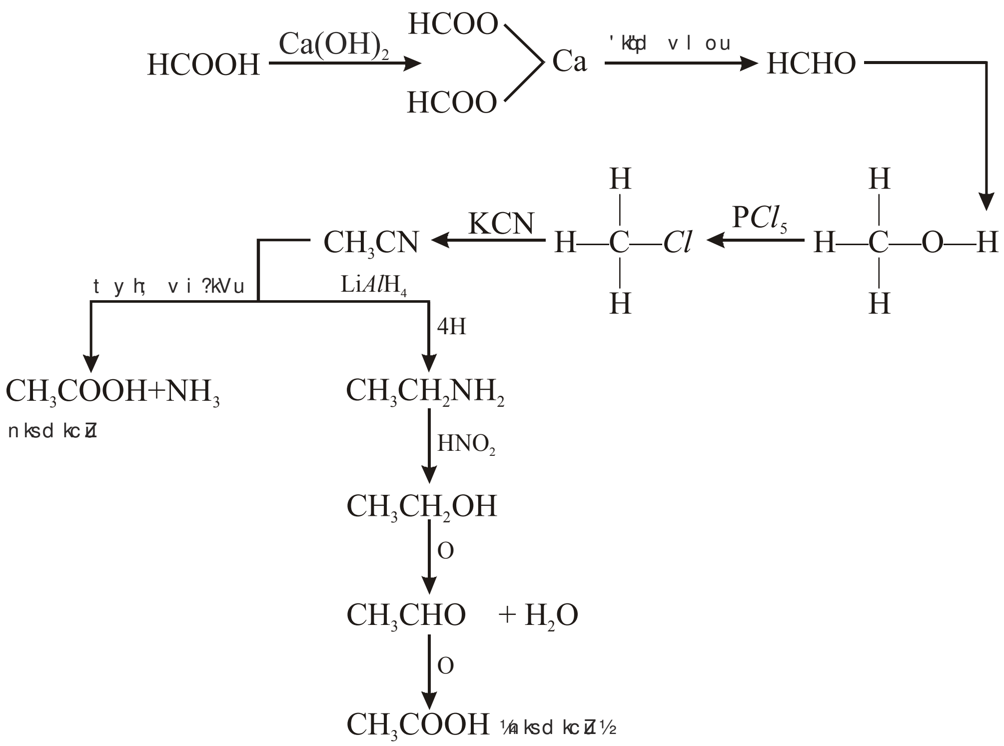
$$C_2H_6 \xrightarrow{Cl_2} C_2H_5Cl \xrightarrow[-KCl]{KCN} C_2H_5CN \xrightarrow{\text{जल अपघटन}} NH_3\uparrow + C_2H_5COOH \xrightarrow[\text{¼bZFkj½}\ -H_2O]{LiAlH_4} C_2H_5CH_2OH$$

$$C_2H_5CH_2OH \xrightarrow{P\text{¼yky½}/HI} \underset{\text{i kszsu}}{C_2H_5CH_3}$$

6- de dkcZu okys vYdksgy ls vf/kd dkcZu okys vYdksgy esa ifjorZu djus ds fy;s fuEu ifØ;k viukbZ tk ldrh gSA



;fn vEyksa esa dkcZu dh la[;k c<kuh gks rc fuEu ifØ;k dks viuk;k tk ldrk gSA



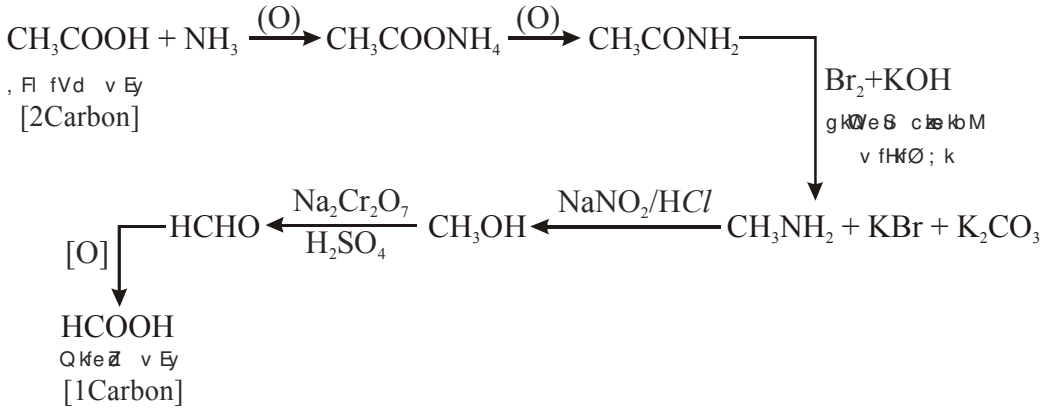
7- ,flfVyhu ls fuEu inkFkksZa dks cukus gsrq viukbZ tkus okyh ;qfDr;kA

uksV& ;kn j[kk tk, fd tc Hkh $-NH_2$ lewg dks $-OH$ esa cnyuk gks $NaNO_2$ rFkk HCl ls fØ;k djk,A

2 v- ,d dkcZu okys dkcksZfDlfyd vEy ls 2 dkcZu okyk vEy cukuk mnkgj.k

Qkfeez vEy $(HCOOH)$ l s CH_3COOH vEy

2 c- nksdkczZ okysdkcksDl fyd vEy l s,d dkczZ okyk vEy cukuk ¼v- dk foi jhr½



i żu&i= Cy w fiżV

BLUE PRINT OF QUESTION PAPER

i jh{kk %gk; j l sd sMjh

d {kk %XII — i wk.kkZd %75

fo"k; %jl k; u 'kkL= — l e; %3 ?k.Vs

l -Ø-	bd kbZ	bd kbZ i j v kofÙkr v ad	v ad okj i żuksa d h l a[; k			d qy i żu
			oLrqfu"V 1 v ad	4 v ad	5 v ad	
1	Bksl v oLFkk	04	1$1$1$1	&	&	&
2	foy ; u	06	1	&	1	1
3	fo|qr jl k; u	06	1	&	1	1
4	jkl k; fud cy xfrd h	05	1	1	&	1
5	l rg jl k; u	04	1$1$1$1	&	&	&
6	d Ùo /kkrqvksa d k fu"d "kZk ,oamud si ze[qk ; kSx d ka d k v/; ; u	05	1	1	&	1
7	*P*& Cy kd d sr Ro I	05	1	1	&	1
8	*P*& Cy kd d sr Ro II	05	1	1	&	1
9	*d* ,oa *f*& Cy kd d sr Ro	06	1	&	1	1
10	mil gl a;kst h jl k; u	04	&	1	&	1
11	gSykss, Yd su ,oa gSykssjhu	04	&	1	&	1
12	v Yd kgy fQ uksyW ,oa bZFkj	04	&	1	&	1
13	v YMhgkbM] d hVksu r Fkk d kcksZfDl fy d v Ey	04	&	1	&	1
14	ukbVªkst u ;qä r d kcZfud ; kSx d	03	1$1$1	&	&	&
15	t Sfo v.kq	05	1	1	&	1
16	I nSfud t hou easjl k; u II Hkkjr d si kpdhu oSKkfud ,oaoSKkfud l LFkku	05	1	1	&	1
	; kss ¾	75	½20½4	10	3	13$4¾17

ukssV& ,ls sv ud Cy w fiżV gks l d rs gSa ft u bd kb;ksa l s oLrqfu"V i żu i wNs x ; s gSa v U; Cy w fiżV eas v U; bd kb;ksa l s Hkh i wNs t k l d rs gSa bl i zd kj fd l h Hkh bd kbZ l s oLrqfu"V i żu i wNs t k l d rs gSaA

i tm'kZ iżui =

I e; %3 ?k.Vs **i wkkd %75**

iżu&1 cgfodYih iżu

v t hjksd fØYou ij vf/kd k'akvk; fud fØLVyksaesami fLFkr gksrk gS **5 vd**

(a) Ýsady nks"k (b) 'kkWVdh nks"k

(c) /kkrq vkf/kD; nks"k (d) dksbZnks"k ugha

c ikW"k; e bcc pky d esafØLVyh dr gksrk gSvr %ik'k; e /kkr esa K dh

I eU; o; u I a[; k gksxhA

(a) 4 (b) 3 (c) 8 (d) 0

I I djhu D; k gS

(a) ifjj{kd (b) feBkl iSnk djusokyk inkFkZ

(c) iżkkUrd (d) nnZfuokjd

n fjdsVl gfMM; ksadk jksx fdI foVkfeu dh deh I sgksrk gS

(a) foVkfeu D (b) foVkfeu K

(c) foVkfeu C (d) foVkfeu A

bZ tc vfHkfØ; k $A+B \rightleftharpoons AB$ esa A dh I kUnzrk nqxuh djusij ; sr c vfHkfØ; k

dk osx gksxkA

(a) pkSxquk (b) nqxuk (c) vifjofrZr (d) vk/kk

iżu&2 fjDr LFkku dh iwfrZ djksA **5 vd**

(a) dkpa ,d ---------------- Bksl gSA

(b) rki c<kusij v/kpkyd dh pkyd rk -------------- gksrh gSA

(c) I kWMk okVj -------------------- foy; u gSA

(d) ekud gkbMªkstu dk byDVªkWM foHko ----------------- gksrk gSA

(e) fV.My izHkko dksy; Mh d.kksadsizdh'k esa ------------- }kjk gksrk gSA

iżu&3 tksMh cukvksA **5 vd**

(a) ik; I (a) vk; ju

(b) fo"kekax rU= (b) fejcsu dk rsy

(c) gsesVkbV (c) nqXèk ; Dr ok"i 'khy nzo

(d) ukbVªkstu hu (d) dksykbMh foy; u

(e) vkbI ksI kbu ukbM (e) ty esa rsy

iz'u&4 ,d 'kCn esa mRrj nhft ;sA **5 vad**

(a) vo{ks dk dksyk; Mh foy;u esa ifjorZu dgykrk gSA

(b) PCl_3 dh vk—fr gksrh gSA

(c) jsM; ksfDVo gSyks u dk uke crkb;sA

(d) nz vLFkk esa ik;s tkus okys sl Øe.k /kkrqdk uke crkvksA

(e) fdl vfHkfØ;k ds vUrxZr e mRiku esa dkcZu J`a[kyk esa ,d dkcZu ijek.kq de gksrk gSA

iz'u&5 vfHkfØ;k dk v)Zvk;qdky lsD;k l e>rs gksA iFke dksfV vfHkfØ;k ds v)Zvk;qdky ds fy;s lw= O;qRiUu dhft ;sA **4 vad**

vFkok

idk'k jklk;fud vfHkfØ;kvksa ds pkj mi;ksx fy[ksaA

iz'u&6 QkWLQksjlQh D;k gS bl sfuEu fcUnqvksa ds vk/kkj ij k l e>kb;sA **4 vad**

1 l qdz h lySV dk fuekZ.k 2 Mssy fiax

vFkok

feJ /kkrq ls D;k l e>rs gks\ dkWij dh rhu feJ /kkrqvksa dk lajpuk u mi;ksx fy[kks

iz'u&7 SO_2 vkSj Cl_2 dh fojatu fØ;kvksa esa vUrj fy[kks **4 vad**

vFkok

rkaca ds sl Fk ukbfVªd vEy dh fØ;kvksa dh l ehdj.k nhft ;s

iz'u&8 dkj.k fy[ksaA **4 vad**

1 HF dks dkap dh cksry esa l qjf{kr ugha j[kk tkrk gS\

2 'kwU; oxZ ds rRo l keku; ifjfLFkfr;ksa esa ;kSfxd ugh cukrs\

vFkok

1 mR—"V xSlksa dh vk;uu Åtk Zl okZsp gksrh gS\

2 l ewg 17 ds rRo izcy vkWDlhdkjd gksrs gS\

iz'u&9 Li"V dhft ;s fd $Ni(CO)_4$ prq"Qydh; gS tcfd $[Ni(CN)_4]^{-2}$ oxZ ery h; gS D;ksa\ **4 vad**

vFkok

$[Fe(CN)_6]^{-3}$ nqcZy vuqpqEcdh; gS tcfd $[Fe(CN)_6]^{-4}$ ifr pqEcdh; gS D;ksa\

iżu&10 fuEufyf[kr ij lehdj.k lfgr fVIi.kh fy[kksA **4 vad**

1 jhej&Vheu vfHkfØ;k 2 dkfcZy,;hu vfHkfØ;k

v Fkok

fuEufyf[kr ij lehdj.k lfgr fVIi.kh fy[kks&

1 DDT 2 BHC

iżu&11 iżkl 'kkyk esa Mkbo,fFky bZFkj cukus dh fof/k dk o.kZu fuEu fcUnqvksa ij djh ft;sA **4 vad**

1 fp= 2 lehdj.k 3 fof/k

v Fkok

'kkjs}kjk ,fFky ,Ydksgy cukus dh fof/k dk o.kZu fuEu fcUnqvksa ij djh ft;sA

1 okWk dk cuuk 2 okWk dk vklou 3 ifj'kks/ku

iżu&12 QkeZYMhgkbM ls fuEu dks ikIr djh ft;sA **4 vad**

1 ;wjksVªkWu 2 isjkQkeZYMhgkbM

3 csUtsy kbV 4 esFkukWy

v Fkok

,lhVd vEy ls fuEu dks ikIr djh ft;sA

1 ,fIfVd ,ugkbMªkbM 2 esFku

3 ,lhVku 4 ,lhVekbM

iżu&13 ikWyhu dks fuEu fcUnqvksa ds vk/kkj ij le>kb;sA **4 vad**

1 izkFkfed lajpuk 2 fo—fr dj.k

v Fkok

DNA o RNA esa ppkj vUrj fy[kksA

iżu&14 Hkkjr ds nks ikS/kks ls izkIr o fud dkscks es a fy[k;sA **4 vad**

v Fkok

fdUgh pkj vkS"k/kh; ikS/kksa ds okuLifrd uke o mudk ,d&,d mi;ksx fy[ksA

iżu&15 1 DoFkukad esa mUu;u D;k gS\ **5 vad**

2 ,d tyh; foy;u $-0.186^\circ C$ ij terk gSA DoFkukad mUu;u Kkr djh ft;s $(K_a = 1.86 K, Kg\ mol^{-1}, K_b = 0.0512 K\ Kg\ mol^{-1})$

v Fkok

1 ijklj.k nkc D;k gS\

2 300 K ij ;fj;k ds ml foy;u dk ijklj.k nkc Kkr djh ft;s ft lds

1 yhVj esa 6 xzke ;wfj;k gSA

(R=0.0821 yhVj ok;qe.My h; fMxzh^{-1} eksy^{-1} ;wfj;k dk v.kqHkkj ¾60)

iz'u&16 vfHkfØ;k dh nj D;k gS\ blds izHkkfor djus okys pkj dkjd fyf[k,\ **5 vad**

vFkok

nqcZy bysDVªksykbV fdls dgrs gSa\ mnkgj.k lfgr le>kb;sA

iz'u&17 ySaFksukbM ladqpu D;k gS\ blds ySaFksukbM ij iM+us okys izHkko] dkj.k rFkk ifj.kke le>kb;sA **5 vad**

vFkok

3D rRoksa ds fuEu xq.kksa dh foospuk dhft;s&

1 mRizsjd xq.k 2 jaxhu vk;u

v kn'kZ mRrj

iżu-1

¼1½ ¼i½ dkbZ nks'k ugh

¼ii½ 8

¼iii½ feBkl i Sk djusokyk inkFkZ

¼iv½ foVkfeu D

¼v½ nkrquk

¼2½ ¼i½ vf Ø LVy h;

¼ii½ of)

¼iii½ xS dk nko ea

¼iv½ 'kU;

¼v½ i d hZku

¼3½ ¼i½ ty earj s

¼ii½ dks kbMh foy ; u

¼iii½ vk; ju

¼iv½ fejcu dk r s

¼v½ nkqZk; Dr ok"i 'khy nko

¼4½ ¼i½ i sVhd j.k

¼ii½ f=dks.kh; fi jkfeM

¼iii½ , LVsVhu

¼iv½ i kjk ¼ej d jh½

¼v½ gkQ eS cks kbM vfHkfØ; k

iżu 5

mRrj & v)Zvk; qkly & og l e; ft l eafØ; kdkjd dh lkUnzk ml dh i kjfEHkd lkUnzk dh vk/kh jg tkrh gSv Fkok og l e; ft l eadkbZ fØ; kv)ZwkZ gks h gSml sbl fØ; k dk v)Zvk; qkly dgrsgSa bl st½l si n f'kZr djrsgSa i Fke dksV d sfy, bl dk ek=d feuV gksk gSa

i Fke dksV vfHkfØ; k d sfy, l w

i Fke dksV vfHkfØ; k d sfy ; sl ekdfy r nj l ehdj.k fuEu gksk gSa

$$K = \frac{2.303}{t} \log \frac{a}{a-x}$$

$$t = \frac{2.303}{K} \log \frac{a}{a-x}$$

$$t½ \text{ ij } x = \frac{a}{2}$$

$$t½ = \frac{2.303}{K} \log \frac{a}{(a-{}^{a}/_{2})}$$

$$t½ = \frac{2.303}{K} \log 2$$

$$t½ = \frac{2.303}{K} \times 0.3010 \qquad [\because \log 2 = 0.3010]$$

$$t½ = \frac{0.693}{K}$$

iFke dksfV vfHkfØ;k dk sfy, v)Zvk;q dky dk eku nj fLFkjkad ds O;qRØekuqikrh gksrk gSA

v Fkok

idk'kjlk;fud vfHkfØ;kd spkj mi;ksx

1- idk'kjlk;fud vfHkfØ;k,a lkSj Åtk Zdk mi;ksx djusdk ,d ek= lk/ku gSA lw;Z lsizkIr Åtk Zdksjlk;fud Åtk Zds:i esa,d f=r djdsbl dk fofHkUu :iksaesaiz;ksx fd;k tkrk gSA

2- jl;u m|ksx esav usd cgqewY; jlk;uksad k fuekZ.k Hkh idk'kjlk;fud vfHkfØ;kvkaj Fkk dkcZfud ;kSfxdkads lay"s.k esa idk'k mRizsjd dk dk;Z djrk gSA

3- QksVksxzkQh v)Zpkyd bysDVªkWfudh lgk;rk lstyy dk idk'k oSdq vigkl djdsgk;Mªkstu bZ/ku cuk;k tkrk gSA

4- vusd vk/kqfud iz$kfSx dh idk'kjlk;fud fØ;kvksaij vk/kkfjr gSQksVksxzkQh] QksVksfi zfVax] jsaxhu QksVksxzkQhvkfn A bl dsv frfjDr vU; mi;ksx Hkh fy[ks tk ldrsgSaA

i'zu 6

mRrj & idk'k dh mifLFkfr esaoLrqvksad sfp= v afdr djusdksQksVksxzkQh dgrsgS;g fl Yoj gSykbM dsidk'k dsizfr lqxzkfgrk ij fuHkZj djrk gSA

1- lqxzkgh lyS V dk fuekZk ftyfVu ;Dr vekfu;e czksekbV ds?kksy esafl Yoj ukbVsV dk vekfu;ke; foy;u feykrsgSaft llsfl Yoj czksekbM vfr eghu d.kksads:i esav o{kfir gkstkrk gSeJ.k dksyxHkx 45° ij dqN le; dsfy, j[k nsrsgSaft lls AgBr dsd.kcMsgksdj mfpr vkdkj dscu tkrsgSA bl idkj AgBr dkftyfVu esa,d beYlu cu tkrk gSA vc dkWp dh lyS V ij yky idk'k dh mifLFkfr esabeYlu dh

,d iryh ijr tek nht krh gS bl ij dkSuk dh vU; fdj.kksa dk iHkko ugha iM+rk gS rFkk bldk mi;ksx dsoy ,ftyfeV eas fo'ks"k idkj ds jaxhu fp= cukus esa fd;k tkrk gSA ,l Hkh jklk;fud fdj.kksa dk ikfyFkhu djus okys ,l vkj ds fj'rs eas ysVsVd dk ijs'kk.kh eas ysVsV dgrs gSA

$$NH_4Br+AgNO_3 \longrightarrow AgBr+ NH_4NO_3$$

2- Mbsyi djuk & QksVksxzkfQd IysV dks ykbV ls ckgj fudkydj (Developer) ifji'Vd jksd eas Mkyk tkrk gSA Mksoyij ik; jksxzs"kky fDouksy gkbMªksfDouksy ;k ,sehMksy tSls vip;kd dk {kkjh; ?kksy gksrk gSA ;g iznk'k }kjk iHkkfor gqbZ AgBr ls Ag vip;u djds fØ;k dks iwjZ djrk gSA Iysv eas ft u Hkkxksa ij iz dk'k iM+k gS ogkW ls Yoj dh dkyh rg te tkrh gSA bl izdkj oLrq dk pedhyk Hkkx Iysv dh vo LFkk eas dkyk gks tkrk gS vkSj dkyk Hkkx lQsn gks tkrk gSA vr% oLrq dk iwjZ mYVk fp= Iysv ij irhr gksrk gSA

$$C_6H_4(OH)_2+AgBr \longrightarrow C_6H4O_2+2Ag+2HBr$$

fDouksy

v Fkok

feJ /kkrq& ;g nks ;k nks ls vf/kd /kkrq ;k v /kkrq dk lekxh feJ.k gSA feJ /kkrq,a viust ud /kkrqvksa dh rqyuk esa vf/kd dBksj] vf/kd xyukad okyh rFkk vf/kd l{kkj.k ifrjks/kh gksrh gSA rkasd h feJ /kkrq,a

l -Ø -	feJ /kkrq dk uke	la Bu	mi ;ksx
1-	ihry	Cu-66 ls 28 % Zn- 20 ls 40 %	crZu ,oa e`fr;k¡ kkW cukus esa
2-	dkalk	Cu-80 ls 90 % Sn-10 ls 25 %	e`fr;k¡ fl Dds o e'khu cukus esa
3-	xu eSVy	Cu-88 % Sn-10 % Zn- 2 %	rksi] cUnwd cukus esa

budsv ykok vU; feJ /kkrq,a fy[kh tk ldrh gSA

i'u 7

mRrj & Dyksjhu dk fojatu vkDlhdj.k }kjk gksrk gS tc fd bl ds foijhr lYQj MkbvkDlkbM dk fojatu vip;u }kjk gksrk gSA

Dyksjhu dk fojatu LFkk;h gksrk gSA

$$Cl_2 + H_2O \longrightarrow HCl + HO_4$$
$$HOCl \longrightarrow HCl + [O]$$

jaxhu inkFkZ + [O] ⟶ jaxghu inkFkZ

SO_2 dk fojatu vLFkk;h gksrk gS D;ksafd osjaxghu inkFkZ ok;q ls Mh dh vkWDlhtu lsvkWDlhd`r gksdj iqu% jaxhu gkstkrk gS&

$$SO_2 + 2H_2O \longrightarrow H_2SO_4 + 2[H]$$

jaxhu inkFkZ + [H] ⟶ jaxghu inkFkZ

jaxghu inkFkZ $\xrightarrow[{[O]}]{}$ jaxhu inkFkZ

vFkok

rkacs dh ukbfVªd vEy lsvfHkfØ;k ,aW&

1- B.Ms, oa 20 ls 25 ifr'kr lkUnz HNO_3 ls

$$4Cu + 10HNO_3 \longrightarrow 4Cu(NO_3)2 + 5H_2O + H_2O$$ ukbVª vkWDlkbM

2- B.Ms, oa 35 ls 45 ifr'kr lkUnz HNO_3 ls

$$3Cu + 8HNO_3 \longrightarrow 3Cu(NO_3)2 + 4H_2O + 2NO$$ ukbfVªd vkWDlkbM

3- B.Ms, oa 50 ifr'kr lkUnz HNO_3 ls

$$Cu + 4HNO_3 \longrightarrow Cu(NO_3)2 + 2H_2O + 2NO_2$$ ukbVªkstu ij

4- 50 ifr'kr lkUnzrk xeZ HNO_3 ls

$$5Cu + 12HNO_3 \longrightarrow 5Cu(NO_3)_2 + 6H_2O + N_2$$ ukbVªkstu

iz'u 8

mRrj & (a) HF dkapdks dh ckgjh euksa ijf{kr ughj [kkstkrk gS D;ksafd og dkap dh ckgjh dsdkp lsfØ;k djmlslkskg nsrk gS

$$SiO_2 + 2H_2F_2 \longrightarrow SiF_4 + 2H_2O$$
Silicontetra Flouride

$$SiF_4 + 2HF \longrightarrow H_2SiF_6$$
Hydro Flourosilic Acid

$$Na_2SiO_3 + 3H_2F_2 \longrightarrow Na_2SiF_6 + 3H_2O$$
Sodium Flourosilicate

vkSj Sodium Flourosilicate cukrk gSA

(b) 'kwU; oxZ¼vkn'kZ xSl½ dsl Hkh ijek.kqdsl Hkh dks'k iwkZ %Hkj sgksrsgSA gHfy;e dksNksMdj lHkh xSlksadh ckâ; r; d{k eaLFkk;h v"Vd O;oLFkk ns^2np^6 gSA gHfy;e esa $1S^2$ LFkk;h foU;kl gSA

1 'kWu; xSlkadsijek.kqeadksZv;qXer by?ksDVªku ugh gSA vr%;sr Ro jklk;fud cU/k ugh acukrsA

2 mPp vk;uu Åtk Zdsdkj.k by?ksDVªku R;kx dj /ku vk;u ugh cukrsA

3 mi{k.kh; by?ksDVªku cU/kqk dsdkj.k ;sby?ksDVªku xzg.k ugh djrsvkSj _.kk;u ugh cukrsA

v Fkok

1 mRÑ"V xSlkadh vk;uu Åtk Zv f/kd gksrh gSD;kasd bu xSlkadk by?ksDVªkWud foU;kl i wkZHkjk ,oaLFkk;h gksrk gSA ft l l sbueal sby?ksDVªku fudkydj vk;u cukusdsfy;svk;uu Åtk Zcgqr v f/kd yxrh gSA bl fy;s;g vfØ; gksrsgSA

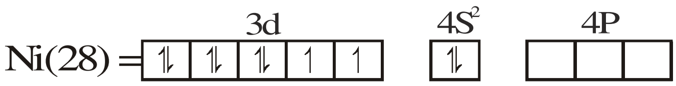
2 l eyw 17 dsrRo izcy v kWDlhdkjd gksrsgSD;kasd bu rRokadh by?ksDVªkWu cU/kqk v f/kd gksrh gSA vr%buesaby?ksDVªkWu xzg.k djusdh{kerk v f/kd gSA bl dkj.k ;g izcy v kWDlhdkjd gksrsgSA

<u>i!zu 9</u>

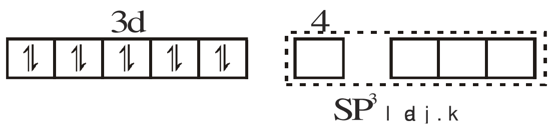
<u>mRrj</u> & (a) [Ni (CO)$_4$] prq'Qydh; gSt cfd [Ni (N)$_4$]$^{-2}$ oxZl ery h; gSD;kasd [Ni (CO)] l adqy esa/krqijek.kq: i esagSA vr%bl dh vkWDlhdj.k l a[;k 'kwU; gSA Ni(28) dk ijek.kqfoU;kl fuEu fy f[kr gSA

$$28Ni = 1S^2, 2S^2, 2P^6, 3S^2, 3P^6, 4S^2 3d^8$$

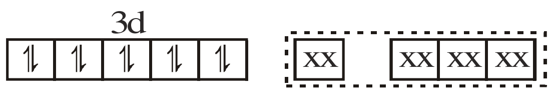
vr%by?ksDVªkfud foU;kl gS



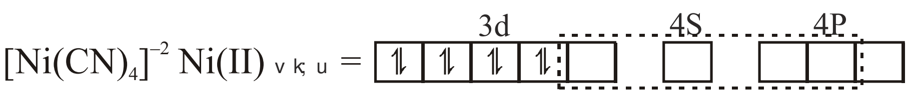
l adj.k dsiwoZrFkk cU/k fuekZk dsfy;s4S by?ksDVªku 3d d{kd eaO ofLFkr gks tkrsgSvr%



vr%l adqy [Ni(CO)$_4$]° esa&



;g SP^3 l adj.kgSbl fy, prq'Qydh; gSt cfd [Ni(CN)$_4$]^2 esaNi dh vkWDlhdj l a[;k +2 gSA vr%Ni^{++} dk by?ksDVªkfud foU;kl gksxk&

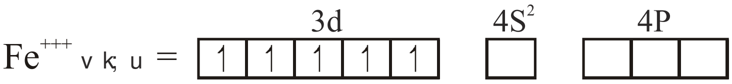


dsp^2 l adj.k dsdkj.k l adqy dh l ajpuk oxZl ery h; gksrh gSA

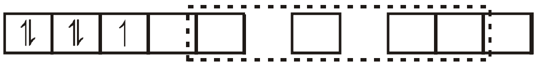
v Fkok

$[Fi(CN)_6]^{-3}$ nqcZy vuqpqEcdh; gSt cfd $[Fe(CN)_6]^{-4}$ izfr pqEcdh; gSD;ksafd $[Fe(CN)_6]^{-3}$ esaQsfjd vk;u esavf}re FkFkk vf}re ls,d d{kk dk byDVªkWud foU;kl fuEu fyf[kr gSA

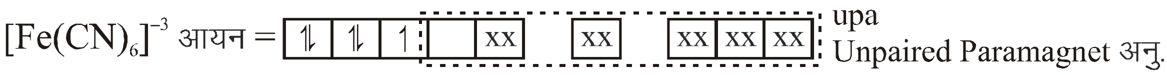
Fe^{+3} dk ijek.kq Øekad gS $26-3^{e}=23$ $= 1s^2, 2s^2p^6, 3s^2p^6d^5$



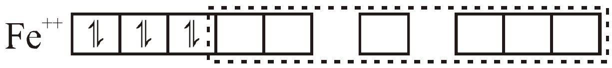
;g d^2sp^3 ladfjr d{kd gSvr%foU;kl



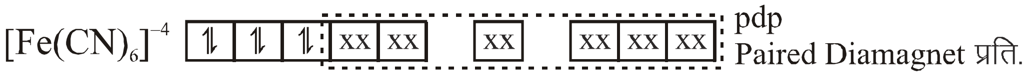
;gka d^2sp^3 ladfjr d{kd 6 byDVªku tksM+ksad sfy;sijz;qDr gksrsgSA



;gkij ,d v;qfXer byDVªkWu gSbl fy, ;g nqcZy vuqpqEcdh; Paramagnetic gSA tcfd $[Fe(CN)_6]^{-4}$ esaladfjr Qsjl vk;u dk byDVªkWud foU;kl



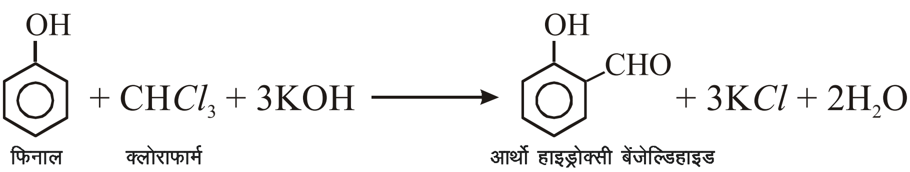
;gkij ladqy fuekZ.k d^2sp^3 ladj.k lsgksxkA



;gkij lHkh byDVªku ;qfXer gSA vr%Qsjks lk;ukbM vk;u dh izÑfr izfr pqEcdh; diamagnetic gksrh gSA

i'zu 10

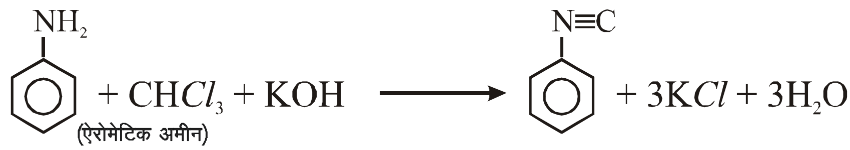
mRrj & (a) **jhej &VheSu vfHkfØ;k** & fQukWy dksdkfLVd {kkj dh mifLFkfr esa DyksjksQkeZ;k dk cZu VªkbZDyksjkbM dslkFk xeZdjusij vkFkksZ;k ijk gkbMªkWDlh ,fYMgkbM ;k vEy curk gSjhej&VheSu vfHkfØ;k dgykrh gSA



(b) **dkfcZy ,ehu vfHkfØ;k** & ,sfyQSfVd ;k ,jksesfVd izkFkfed ,ehu dks $CHCl_3$ rFkk ,Ydksgkyh; KOH dslkFk xeZdjusij rhoznqxZU/k ;qDr Qsuy vkblkslk;ukbM ¼dkfcZy ,feu½ curk gSA

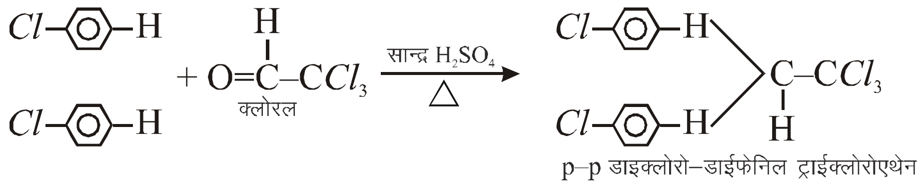
$$C_2H_5NH_2 + CHCl_3 + 3KOH \longrightarrow C_2H_5N{\equiv}C + 3KCl + 3H_2O$$

,ygQSfVd vehu

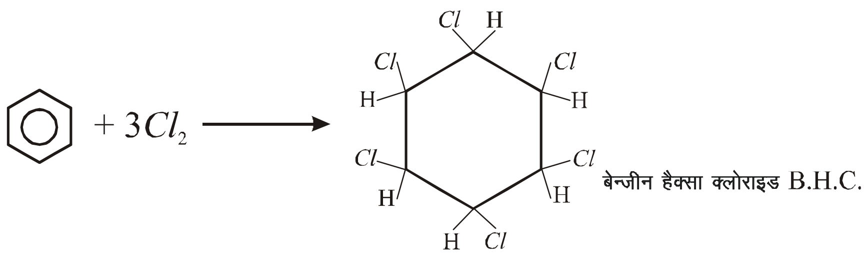


v Fkok

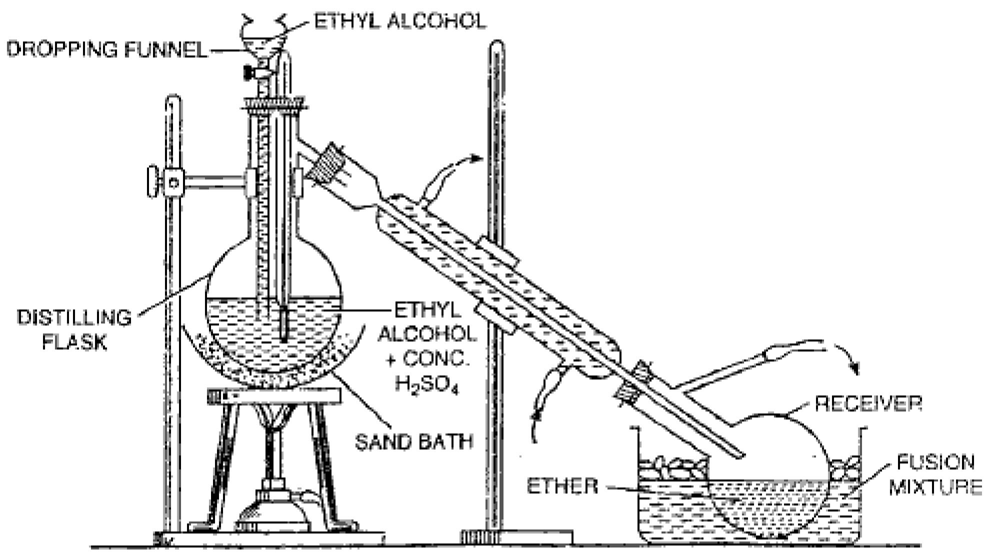
(1) D.D.T. i Sk & MkbDy kjks MkbQsuy VªkbDy kjks , Fksu bl d k jkl k; fud uke gS bl sDy kjkscsa hu d snksv .kq ksad h I kUnz H_2SO_4 d h mi fLFkfr esaDy kjy ¼VªkbDy kjks , s hVsYMgkbM½d sl kFk v fHkfØ ; k d j kusi j D.D.T. cur k gSA



(2) B.H.C. bl d k jkl k; fud uke csa hu gSDl kDy kjkbM gScsa hu d ks Cl_2 d sl kFk I ;wZi zd k'k d h mi fLFkfr esafØ ; k d j kusi j B.H.C.i kIr gksk gSA bl s666 ; k x SeSDl su ; k 1]2]3]4]5]6 gSDl k DYkksjksl kbDy ksgSDl su Hkh d gr sgSA



i żu- 11 bFkj cukusd h i z ksx 'kky k fof/k %&



Laboratory preparation of ether

mRi j & fp=

l ehdj.k $$C_2H_5OH + H_2SO4 \xrightarrow{383K} C_2H_5HSO_4 + H_2O$$

$$C_2H_5HSO_4 + C_2H_5OH \xrightarrow{410K} C_2H_5{-}O{-}C_2H_5 + H_2SO_4$$

fof/k %& 25 xke i kVs'k; e MkbØkses V dks 100 ml t y ea?kksy dj ,d xksy i saihds ¶ykLd eay sys sg&A fcUnq kjhdhi ea 100ml ,Fksuky rFkk 20 ml lkUnz H_2SO_4 dk feJ.k y sfy ;k t kr k gSfp=kuq kj mi dj.k r \$kj dj ¶ykLd dkst y m"ed ij xeZ djrsg&A cuhgbZoK"i l &kfu= eal sxq jrhg&A bl vfHkfØ;k eai n (ii) ea H_2SO_4 iq% mRi Uu gkst kr k gSt ks C_2H_5OH l si n (i) dsvuq kj fØ;k djdsmlsiq%bFkj ea cnyr k gSbl fy , bl sv fojy bFkj hdj.k dh fof/k Hkh dgr sg&A

'kksku & i zkIr 'kky k fof/k l si klr bFkj ea ,Fksuky] t y] o l Y¶;fjd vEy dh v'kq) ;kWgksrh g&A i gy sbFkj dks NaOH foy;u l s/kks sg&Aft l l sl Y¶;fjd vEy dh v'kq) nwj gkst krh g&A bFkj oky sry dksi Fkd djdsml ea 50 ifr'kr $CaCl_2$ foy;u fey kr sg&Abl l s,Yd kgkW vyx gkst kr k g&A i FkDdkjhdhi }kjk bFkj dksi Fkd dj ysrs g&Ar Fkk vuknz $CaCl_2$ dsmi j l {wkk y ssg&A $54°–36°C$ ij iq%vklou djusl s'kq) bFkj i klr gksk g&A

vFkok

'khjs l s ,Yd kgy cukusdh fof/k

1- **ok'kd k cuuk** %& xUusdsjl l s'kDdj d sfØLVy i Fkd dj ysusd si 'pkr i hy sxk<s jax dk pk uht ks Sknz cprk gSft l s'khjk dgrsg&A 'khjseat y fey kdj 8 l s10 ifr'kr ruqdjrsg&A vkS bl eaFkksMh ek=k eavekfu;e l YQsV vkS vekfu;e QkLQsV rFkk l Y¶;fjd vEy fey k fn;k t kr k gSmDr foy;u ea 5% ;hLV fey k fn;k t kr k g&A feJ.kdks 2 l s4 fnu dsfy , $25°$ l s $30°C$ fMxh rki ij j[k nsrsg&A dqN l e; i'pkr ;hLV eami fLFkr ,Ut kbekadh mRizsd fØ;kv kas}kjk ,Fksuky cu t kr k g&A

$$\underset{\text{गन्ने की शक्कर}}{C_{12}H_{22}O_{11}} + H_2O \xrightarrow[\text{इन्वर्टेज}]{\text{ईस्ट एन्जाइम}} \underset{\text{ग्लूकोज}}{C_6H_{12}O_6} + \underset{\text{फ्रक्टोज}}{C_6H_{12}O_6}$$

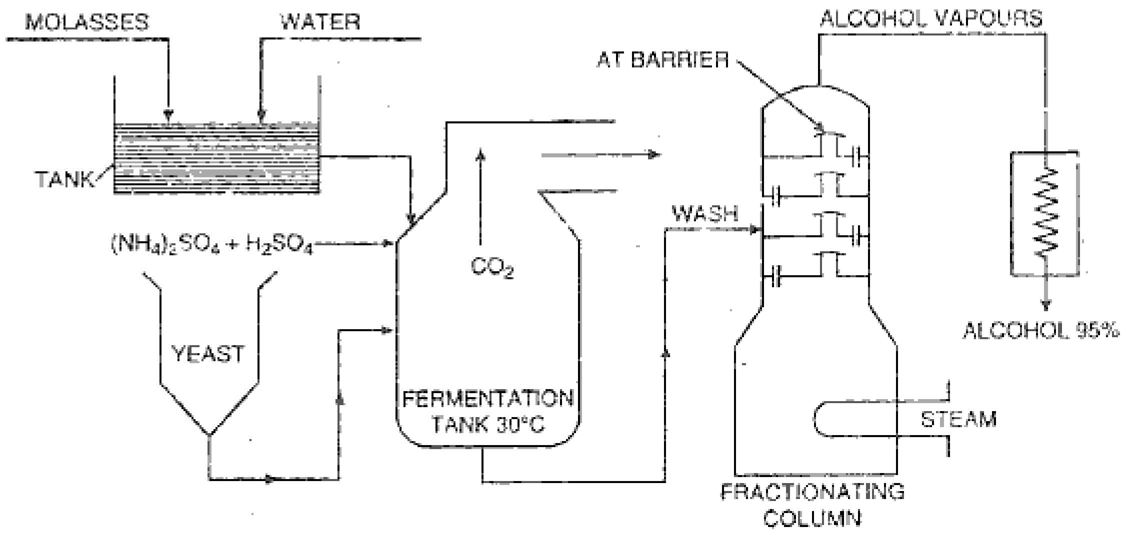
$$C_6H_{12}O_6 \xrightarrow[\text{ईस्ट}]{\text{जाइमेज}} 2C_2H_5OH + 2CO_2$$

i klr foy;u dksok'k dgrsg&Aft l ea 6 l s10 ifr'kr C_2H_5OH rFkk 'ks'k t y vkS vU; v'kq) gksh g&A

2- **ok'kd k vklou** %& ok'kd k vklou dkQs Hkhd seafd;k t kr k gSbl eanks Lr EHk gksrsg&Afo'ysk"kd rFkk ifj'kksk"kd t ks,d nwl jsl st qMsgksrsg&A ok'kd ksl fiZ kdj

uyh }kjk ifj'kksf/kd eal si zokfgr djrs gSa ijUrq xeZ ok"i fo'ys"kd dsmijh fgLls ls /kkjk&/kkjs fxjrk gSA fo'ys"kd esa mij dh vksj tkrh gqbZ Hkki uhps dh vksj vkrs gq, ok'k ds lEidZ esa vkrh gS rFkk mlesa ls ,YdksgkWy ok"i djrh gS, ,YdksgkWy dk DoFkukad 78-3 gS vr% ;g ok"i esa vk xbZ gS tks mij dh vksj fudy tkrk gSA bu ok"i dks l?kfur djus ls yxHkx 90 izfr'kr ,YdksgkWy izkIr gksrk gSA

fp=



Manufacture of ethyl alcohol from molasses

3- ifj'kks/ku & ok'k dk ifj'kks/ku izHkkth vklou ls djrs gSA izHkkth vklou djus ij rhu izHkkt izkIr gksrs gSA

1- izFke izHkkt & blesa ,lhVsfYMgkbM vkfn de DoFkukad ds vinzO; gksrs gSA

2- f}rh; izHkkt & blesa 93&93-6 izfr'kr ,fFky ,YdksgkWy gksrk gS blds ifj'kks/ku ls ifj'kq) ,YdksgkWy feyrk gSA

3- vafre izHkkt & bls ¶;wty rsy dgrs gS blesa mPp DoFkukad okys vinzO; gksrs gSA

i'zu 12

mRrj & QkesZfYMgkbM ls fufeZr dkscuk;s &

(1) ;wjksVªkfQu &

$$6HCHO + 4NH_3 \longrightarrow (CH_2)_6N_4 + 6H_2O$$

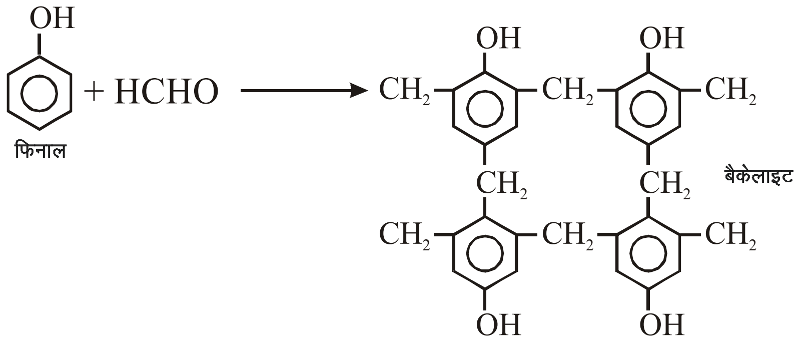
हेक्सामेथिलीन टेट्राअमीन (यूरोट्रापिन)

(2) iSjk QkesZfYMgkbM &

$$n\,HCHO \xrightarrow{\text{वाष्पित करने पर}} (HCHO)_n$$

पैरा फार्मेल्डिहाइड

(3) cSdsykbM &



(4) eSFkukWy &

$$HCHO + H_2 \xrightarrow{Ni} CH_3OH$$

पैरा फार्मेल्डिहाइड

vFkok

,lhfVd vEy ls fuEu izkIr djuk

(1) ,slhfVd ,UgkbMªkbM cukuk & $[CH_3CO–O–COCH_3]$

$$\begin{matrix} CH_3COOH \\ CH_3COOH \end{matrix} + P_2O_5 \longrightarrow \begin{matrix} CH_3CO \\ CH_3CO \end{matrix} \rangle O + H_2O$$

(2) esFksu cukuk & $[CH_3OH]$

$$CH_3COOH + NaOH \longrightarrow CH_3COONa \xrightarrow[CaO]{NaOH} CH_4 + Na_2CO_3$$

(3) ,lhVksu & $[CH_3COCH_3]$

$$CH_3COOH + Ca(OH)_2 \longrightarrow (CH_3COO)_2Ca \xrightarrow{\triangle} CH_3COCH_3 + CaCO_3$$

(4) ,slhVekbM & $[CH_3CONH_2]$

$$CH_3COOH + NH_3 \longrightarrow CH_3COONH_4 \xrightarrow{\triangle} CH_3CONH_2 + H_2O$$

अमोनियम ऐसीटेट ऐसेटामाइड

iz'u 13

mRrj & (1) **izksVhu dh izkFkfed lajpuk** & iqLrd ls n`{kdj tkudkjh izkIr djsa

(2) **fo—frdj.k** & izksVhu dk fo—frdj.k esa izksVhu m"ek rFkk jlk;uksa ls izHkkfor gksrs gSaA izksVhu dks xeZ djus ij vFkok jlk;fud ;kSfxdksa ls fØ;k djkus ij bldh tSfod fØ;k'khyrk u"V gks tkrh gS vkSj ;s Lo fLFkr gksdj vfoy; gks tkrs gSaA bl fØ;k dks izksVhu dk fo—frdj.k dgrs gSaA fo—frdj.k ls izksVhu dh izkFkfed lajpuk vifjofrZr

jgrh gSfd Ut qf}rh; d ,oar`rh; d I apukeaifjorZu gkst krk gSt Ss& t c v.Msd ks mcyrsgq ikuheaadN nsa d sfy , j[krsgSrksv.Msd hiksVhu vfoy s j.kksakj iksVhu eaifjofrZr gkst krh gSft l ls iksVhu Ld fUur gkst krk gSv FkkZ iksVhu d k fod`fr d j.k gkst krk gSA

v Fkok

D.N.A. o R.N.A. eapkj fuEu fyf[kr v ar j gSA

	R.N.A.	D.N.A.
1-	bl dh ,d y gsfy DI l apuk gksrh gS	bl dh f} Vsfy DI l apuk gksrh gSft l ea
2-	ft l eaj kbokst 'kdZ k gksrh gS	Mh& v kDl hj kbcksl 'kdZ k gksrh gSA
3-	bl dsik;jhfeMhu {kkj ea;jsfl y gksrk gSA	bl eaik;jhfeMhu {kkj eaFkk;ehu gksrk gSA
4-	;g l kbVksIykTe o Øksekslksa eaik;k t krk gSft l d k eq[; d k;ZiksVhu fuekZk gSA	;g ukfHkd eaik;k t krk gSft l d k eq[; d k;Zi Sr`d xq.kkad sokgd d s:i eaad k;Z djrk gSA
	;g l aysk okgd d k d k;Z djrk gSA	iR;sd D.N.A. ,d ;k ,d l s vf/kd ,Ut kbe d sd k;Z d k fun sZk djrk gSA

i zu 14

mRrj & ikpu Hkkjrh; oSKkfud

(1) **pjd** & fpfdRI k 'kkL= d s{ks= eaegku d k;Zd sfy , pjd d ksfpfdRI k 'kkL= d kfirk d gk t krk gSA

v k;qoZn eav kpk;Z pjd d k ;ksnku egRoi w.kZgSAD;kfd bUgksaaekuo l apuk ,oa jDr l apkj d scksj seaegRoi w.kZt kudkjh miyC/k djokbZgSA bl d sv frfjDr e/kqeg] {k;jksx ,oa`n; l aca/kh chekjh d smipkj Hkh crk;sgSA

bud s}kjk jfpr pjd l fgrk d ksv k;qoZn d kfo'o d ksk ekuk t krk gSA

pjd usbl pjd l fgrk ea1 yk[k t Mh&cwfV;kad h xq.kkoRrk ,oamI dh d k;Z izkkyh d kscrk;k gSmUgksaus ekuk gSfd /kkfeZd l kp o LokLF; d kl aca/k gksrk gSA mUgksaus d gk gSfd 'kjhj efLr "d ij Hkks u o nSud fØ;kDyki kad k izHkko gksrk gSA ft l l sjksxksa d ksv kl kuh l sigpkuk d j funku fd ;k t k l drk gSA

(2) **v kpk;Z.kkn** & v kpk;Zd .kkn d ksijek.kqfl)kUr d k t ud ekuk t krk gSA os oSks'kd n'kZu d si zoZd ekust krsgSA oSks'kd n'kZu d keyw v k/kkj ijek.kqokn gSA mud s v uqlkj l Hkh oLrq,auksVsr Rokasl sfey d j cuh gksrh gSi Foh] ikuh] gok] v kdk'k] efLr "d] idk'k] ekSe] l e; t xg gSA

v kpk;Z.kkn usMkYVu d sfl)kar d sgt kjksao"kZi woZcrk;k kfd cgek.M d siR;sd

d.kdk fuekZk ijek.kq}kjk gqvk gSA mUgksaus v.kqvksa dh xfr] foekvksa vkSj jklk;fud fØ;kvksa dks cgqr seaHkh crk;k gSA ¼bl ds vfrfjDr vU; oSKkfud tSls& vkpk;Z lqJqr] vkpk;Z ukxktqZu] ck.kHkV vkfn oSKkfudksa dks Hkh crk;k tk ldrk gSA½

vFkok

iz'u 15

mRrj & (a) DoFkukad esa mUu;u & fdlh nzo dk DoFkukad og rki gS ftl ij mlds ok"i nkc dk eku ok;qe.My h; nkc ds cjkcj gks tkrk gSA vr% ge tkurs gSa fd fdlh foy;u dk ok"i nkc 'kq) foyk;d ds ok"i nkc ls de gksrk gSA vr% og rki ftl ij fdlh foy;u dk ok"i nkc ok;q.My h; nkc ds cjkcj gks tkrk gSA ¼vFkkZr foy;u dk DoFkukad½ ml rki ls vf/kd gksrk ftl ij 'kq) foyk;d dk ok"i nkc ok;q.My h; nkc ds cjkcj gks tkrk gS ¼vFkkZr 'kq) foyk;d dk DoFkukad½; kfu 'kq) foyk;d esa dksbZ foys; feykus ij mlds DoFkukad esa gksus okyh o`f) DoFkukad dk mYy a?ku dgykrh gSA bls $\triangle Tb$ ls iznf'kZr djrs gSa vr% $\triangle Tb = Tb - Tb°$

$$\text{fgekad voueu } \triangle Tf = 0 - (-0186) = 0.186°C$$

$$\text{fgekad voueu fLFkjkad } Kf = 1.86\ K\ Kg\ mol^{-1}$$

$$\text{DoFkukad mUu;u fLFkjkad } Kb = 0.512\ K\ Kg\ mol^{-1}$$

$$\triangle Tf = Kf \text{ x eksy yrk}$$

$$\text{eksy yrk} = \frac{\triangle Tf}{Kf} = \frac{0.186}{0.186} = 0.2$$

$$\triangle Tb = Kf \text{ x eksy yrk}$$

$$\triangle Tf = 0.512 \text{ x } 0.1$$

$$\triangle Tf = 0.512°C$$

DokFkukad dk mUu;u $= 0.512°C$

vFkok

ijklj.k nkc & v) ZikjxE; f>Yyh }kjk foyk;d v.kqvksa ds foy;u dh vksj gksus okys izokg dks jksdus ds fy;s foy;u ij yxk;k x;k nkc ijklj.k nkc dgykrk gSA

$$(2) \qquad \pi v = nRT = \frac{WB}{MB} RT$$

iz'u ds vuqlkj $V = 1$ yhVj] $T = 300\ k$, $R=0.0821$ yhVj ok;q.My h;] $WB =$ foys; dk nzO;eku] $MB =$ foys; dk vf.od nzO;eku fMxzh^{-1} eksy^{-1}

$$\text{ijklj.k nkc } \pi = \frac{WB}{MB} \text{ x } \frac{RT}{V} = \frac{6}{60} \text{ x } \frac{0.0821 \text{ x } 300}{1} = 2.46 \text{ ok;q.My}$$

$$\text{ijklj.k nkc } = 2.46 \text{ ok;q.My}$$

iz'u 16

mRrj & vfHkfØ;k ds vfHkdkjdksa vFkok fØ;kQyksa dh lkUnzrkvksa esa le; ds lkFk tks ifjorZu gksrk gS mls vfHkfØ;k nj dgrs gSA

vfHkfØ;k nj ¾ $\dfrac{\text{fØ;kdkjd rFkk fØ;kQy dh lkUnzk esa ifjorZu}}{\text{le; vUrjky}}$

bdkbZ& eksy fyVj^{-1} lsd.M^{-1}

vfHkfØ;k dh nj dks izHkkfor djus okys dkjd &

1- vfHkdkjd dk lkUnzk& vfHkdkjd dk lkUh.k c<+kus ij vfHkfØ;k dh nj c<+ tkrh gSD;ksafd vfHkfØ;k vfHkdkjd dsl fØ; nÕ eku dsl ekuqkrh gSA lkUnzk c<+kus ij vfHkdkjd v.kqvksa dh la[;k c<+ tkrh gS ftlls izHkkoh VDDjksa dh la[;k esa o`f) gks tkrh gSA

2- vfHkfØ;k dk rki& lkekU; vfHkfØ;kvksa esa rki c<+kus ls vfHkfØ;k dh nj esa o`f) gks tkrh gS D;ksafd rki c<+kus ls v.kqvksa dh xfrt ÅtkZ dk eku c<+ tkrk gSA iz;ksxksa }kjk ns[kk x;k gS fd izfr 10 rki o`f) ls vfHkfØ;k dh nj nks ls rhu xquh rd gks tkrh gSA

3- mRizsjd dh mifLFkfr& mRizsjd dh mifLFkfr ls lfØ; Å tkZ dk eku ifjofrZr gks tkrk gSA ftlls vfHkfØ;k dh nj ifjofrZr gks tkrk gS ftlls vfHkfØ;k dh nj ifjofrZr gks tkrh gSA /kukRed mRizsjd vfHkfØ;k dks c<+k nsrs gSa cfYd _.kkRed mRizsjd vfHkfØ;k nj esa o`f) gks tkrh gSA

4- nkc& xSlh; vfHkfØ;kvksa esa nkc c<+kus ls vfHkfØ;k dh nj c<+ tkrh gSA nkc c<+kus ls vfHkdkjd v.kqikl &ikl vk tkrs gSa izHkkoh VDDjksa dh la[;k c<+ tkrh gSA ftlls vfHkfØ;k nj esa o`f) gks tkrh gSA

¼bl dsvykok izdk'k {ks=Qy Hkh fy[kk tk ldrk gS½

vFkok

nsgyh ÅtkZ& lfØ;r v.kqdks ijLij tksM+us ds fy, vko';d ÅtkZ gks nsgyh ÅtkZ dgrs gSA nsgyh ÅtkZ ;fn v.kqvksa ds bl U;wure ÅtkZ ls vf/kd gks rc v.kqvksa esa cny tkrk gSA

nsgyh ÅtkZ ¾ v.kqdh fu;r ÅtkZ + lfØ;.k ÅtkZ

lfØ;.k ÅtkZ& og ÅtkZ tks v.kqdks lfØ; djus ds fy, vko';d gksrh gS lfØ;.k ÅtkZ ikdj v.kq ÅtkZ vojks/k dks ikj dj mRikn esa cny ldrk gSA

lfØ;.k ÅtkZ = nsgyh ÅtkZ & v.kqdh fu;r ÅtkZ

lfØ;.k ÅtkZ vkSj nsgyh ÅtkZ esa lEcU/k & lfØ;.k ÅtkZ vkSj nsgyh ÅtkZ esa ifjLi fudV dk lEcU/k gksrk gS v.kq ÅtkZ xzg.k djds lfØ;.k ÅtkZ ikdj nsgyh ÅtkZ rd igq¡p tkrk gS tks'kh?kz gh nsgyh ÅtkZ esa cny tkrh gSA nsgyh ÅtkZ ;fn v.kq mRikn esa cny tkrk gSA vr%

lfØ;.k ÅtkZ = nsgyh ÅtkZ & v.kqdh fu;r ÅtkZ

nsgyh ÅtkZ = lfØ;.k ÅtkZ + v.kqdh fu;r ÅtkZ

iżu &17

mRrj & **y SFksukbM l ad qpu** & y SUFksukbMks ads sijek.kqØekad dsc<+us ds lkFk lkFk muds ijek.kq ka, oavk;ukadsvkdkj eadehgksrhgSbl syS Fksuk bM l ad qpu dgrsgSA

dkj.k & y SFksukbMksaeavkUrfjd bysDVªku Øe'k% 4f d{kdeaeatkrsgSftlds }kjk iznku fd;k x;k ifjj{k.k ¼Shielding½ de gksrkgSAy SUFksukbM l ad qpu dksmi;ZqDr dkj.kksa ds vk/kkj ij le>k;k tk ldrk gSA

y SFksukbM l ad qpu d si fj.kke & y SFksukbM l ad qpu fuEu fyf[kr dkjdksad ksi Hkkfor djrk gSA

1- vk;u dk vkdkj %y SFksukbMksads vk;ukadk vkdkj Øe'k%de gkstkrkgSA

2- fo|qr _.kkRedrk % $Ce(58)$ ls $Lu(71)$ rd fo|qr _.kkRedrk Øe'k%vf/kd gksrhgSA

3- vip;u foHko $+3$ vkDlhdj.k voLFkk dsfy, vip;u foHko Øe'k% -2.48v ls -2.25v rd $Ce(58)$ ls $Lu(71)$ rd vf/kd gksrk tkrk gSA

vFkok

lØe.k rRoksa (3D) dsxq.k &

1- **mRizsjdh; xq.k** & fofHkUu jklk;fud vfHkfØ;kvksaeaiz;qDr gksusokysmRizsjd i;k%lØe.k JsPkh okysrRo vFkok muds ;kSfxd gksrsgSA

lØe.kdhmRizsj.k fØ;k'khyrk dsfuEu dkj.k gSA

v- ek/;fed ;kSfxd dk fuekZk& lØe.k rRo ifjorhZl ak;kstdrkdsdkj.kvLFkk;h ek/;fed ;kSfxd cukysrsgSvkSj bl izdkj ,d fuEurj lfØ;.kÅtkZokyk uohu iFk vfHkfØ;kdsfy, miyC/k djokrsgSA

c- i"B {ks= & lØe.k rRoksadki"B {ks=Qy vf/kd gksrk gSbl fy, lak;kstdrk, a Lora= vf/kd gkstkrhgSA vr%;srRo viuh lrg ij vfHkdkjdksadksvf/kd"kr dj ysrsgSA ftl lsi"B {ks=Qy ij vfHkdkjdksadklkUnzrkc<+tkrk gSQyLo:i fØ;kRed os x eaof)+ gkstkrhgSA

2- **jaxhu vk;u** & lØe.k rRoksads $(n-1)$ miØksk vkaf'kd Hkjsgksrsgsbuesa mifLFkr vk;ujr bysDVªku n'; izdk'kdhÅtkZdksvo'kksf"kr djdsmPp ÅtkZokyh fjDr vkfoZy eapystkrsgSA lØe.kgkstkrkgSQyLo:i ijkofrZr izdk'klQsn u gksdj jaxhu gkstkgSbl fy, lØe.krRoksads;kSfxd vFkokvk;u jaxhu gksrsgSA

mnkgj.k % $Cu^{+} = 1s^{2}, 2s^{2}p^{6}, 3s^{2}p^{6}d^{10}, 4s^{\circ}$

$Cu^{++} = 1s^{2}, 2s^{2}p^{6}, 3s^{2}p^{6}d^{9}, 4s^{\circ}$

bysDVªkfud foU;kl lsLi"V gSfd Cu^{+} ¼D;wizl½vk;u eal Hkh bysDVªku ;qfXer gSbl fy, n';izdk'kdhÅtkZdksvi'kksf"kr djdsbl dsbysDVªku mRrsftr ughgksrsgSavFkkZr lØe.kugh gksrk gSA QyLo:i ijkofrZr izdk'klQsn gksrk gSA bl fy, Cu^{++} jaxghu gksrk gSA tcfd Cu^{++} vk;u ls,d bysDVªku vk;qfXer gksrk gS;g n';izdk'kdhÅtkZdksvo'kksf"kr djdsmPp ÅtkZ Lrj eadwn tkrk gSA C^{++} lØe.kgkstkrk gSA QyLo:i ifjofrZr izdk'klQsn u gksdj jaxhu gksrk gSA bl fy, Cu^{++} vk;u jaxhu gksrk gSA