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**

bdkbokj dfBu fo"k;k'kk dk fu/kkj.k

Chemistry–XII

Unit-1 Bkikoo LFkk % **Solid State**

f}foeh; ,o f=foeh; fØLVyk e bdkb ly dh ljpuk,A bdkb ly dh ?kuRo x.kukA ,dd ly e ijek.kvk dh l[;k dk fu/kkj.k] fofHkUu idkj dh Bkl e ifdx ¼ldyu½] fjfDr;k (Voids), Bkl d fo|rh;] pEcdh; x.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;uk dh lkanrk 0;Dr djukA Bkl d nok e foy;uA Bkl feyku ij ok"i nkc e vkif{kd voueuA DoFkukd e mUu;u vkj no.kkd ;k fgekd dk voueuA v.k n0;ekuk dh x.kukA vlkekU; v.k n0;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|r jlk;u % **Electro Chemistry**

foy;uk e pkydrk] fof'k"B ,o vkf.od pkydrkA fdlh ly dk fo|r okgd cy] ekud byDVkM foHkoA uLV lehdj.k rFkk bld mi;kx ¼vui;kx½] b/ku lyA

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 ,o vklr vfHkfØ;k nj rFkk bl iHkkfor dju oky dkjdA fdlh vfHkfØ;k dh vkf.odrk ,o dkfV] fof'k"V nj fLFkjkdA 'kU; ,o iFke dkfV jklk;fud vfHkfØ;kvk d fy; v/k vk;A nj fLFkjkd dh rki ij fuHkjrk] vkjghfu;l lehdj.kA lfØ;.k Åtk ,o ngyh ÅtkA

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)

Bklk }kjk xlk d vf/k'kk"k.k dk iHkkfor dju oky dkjd] iln ij vk/kkfjr fØ;k'khyrk ¼lfØ;rk ,o oj.k {kerk½] ,Utkbe mRijd] cg v.kd rFkk lxf.kr v.kvk d dfyy foy;u@ik;l ,o bud idkj@

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

Unit-6 /kkrvk d fu"d"k.k rFkk mud ie[k ;kfxdk dk v/;;u (Extraction of some Metals and study of Their important compounds)

Al, Cu, Zn, Fe, rFkk Ag d L=kr@fu"d"k.k d fl)kr@ $CuSO_4$, $AgNO_3$ rFkk HgX d cuku dh fof/k;k] x.k ,o mi;kx@LVhy] QkVkxkQhA

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*-Cykd d rRo (P-Block Elements)

leg 15 d rRo & (N^7–P^{15}–As^{37}–sb^{51}–Bi^{83})

byDVkfud foU;kl] ikfIr LFkku] vkDlhdj.k voLFkk,@x.kk e Øfedrk@ukbVk tu vkDlkbMk dh ljpukA QkLQkjl d ;kfxd@PCl_5 dh Hkkfr NCl_5 dk ugh cuu dk dkj.kA

leg 16 d rRo & (O^8 – S^8 – Se^{34} – Te^{52} – Po^{84})

byDVkfud foU;kl] ikfIr LFkku] vkDlhdj.k voLFkk, @ x.kk e Øfedrk@lYQj d vkDlk vEyk dh ljpuk H_2O no rFkk H_2S xl gku dk 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*-Cykd d rRo (Element of P-Block)

leg 17 d rRo & (F - Cl- Br- I- At)

byDVkfud foU;kl] vkDlhdj.k voLFkk,] ikfIr LFkku] x.kk e Øfedrk A bUVj gyk tu ;kfxd rFkk bud cuu d dkj.kA

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

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

byDVkfud foU;kl] ikfIr LFkku] x.kk e Øfedrk] tuu ¶ykjkbMl

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

Unit-9 *d*– rFkk *f*– Cykd d rRo (*d* and *f* Block Elements)

¼leg&3 l 12 d rRo rFkk yUFkukbMl ,o ,DVhukbMl½

byDVkfud foU;kl] ikfIr LFkku] lØe.k ¼Vkth'ku½ /kkrvk dh fo'k"krk,] iFke ifDr d lØe.k rRok d x.kk e lkekU; Øfedrk A ?kkfRod x.k] vk;kukbt'ku ,UFkYih] vkDlhdj.k voLFkk,] vk;fud f=T;k,] jx] mRijdh; x.k] pEcdh; x.k] vUrjkdk'kh; ;kfxd] feJ /kkr fuek.kA

yUFkukbMl& byDVkfud foU;kl] vkDlhdj.k voLFkk,] jklk;fud fØ;k'khyrk] yUFkukbM ldpuA

,DVhukbMl& byDVkfud 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 mi lg&l;kth jlk;u (Co-ordination Chemistry)

lyXuh ¼fytUMl½] mi lgl;kth l[;k] jx] pEcdh; x.k ,o vkdfr;k] ,d&ukfHkdh; mi lgl;kth ;kfxdk dk IUPAC ukedj.k] vkc/ku] leko;ork] bu ;kfxdk dk egRo@¼x.kRed fo'y"k.k] ?kkfRod 'kk/ku vkj tfod iØek e½] dkc ?kkfRod ;kfxdA

(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 gyk ,YdUl rFkk gyk,jhUl

gyk,YdUl& ukedj.k] C-x cU/k dh idfr] Hkkfrd ,o jlk;fud x.k] ifrLFkkiu fØ;kvk dh fØ;kfof/kA

gyk,jhUl& ukedj.k] C-X cU/k dh idfr] ifrLFkkiu fØ;k, rFkk ,dy ifrLFkkiu ;kfxdk e gyktuk dk nf'kd iHkkoA MkbDykjk] VkbDykjk rFkk VVkDykjk eFku] vk;kMkQke] Ýhvku] DDT, rFkk BHC d i;kx l i;kfoj.kh; iHkkoA

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.

bdkb &12 ,Ydkgy fQuky rFkk bFkj

,Ydkgy & ukedj.k] ikFkfed f}rh;d ,o rrh;d vYdkgy dh igpku] futyhdj.k dh fØ;kfof/kA

fQuky & ukedj.k] vEyh; idfr dk dkj.k] byDVk fQfyd ifrLFkkiu fØ;k,A

bFkj & 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.

bdkb &13 ,YMhgkbMl dhVkUl rFkk dkckfDlfyd vEy

vYMhgkbM rFkk dhVkUl & dkckukby leg dh idfr vYMhgkbMl e vYQk gkbMktu dh fØ;k'khyrk] U;fDyvkfQfyd ;kx'khy fØ;kvk dh fØ;kfof/kA

dkckfDlfyd vEy & ukedj.k] vEyh; idfr 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.

bdkb &14 ukbVk tu ;Dr dkcfud ;kfxd
ukbVk ;kfxd & idkj] egRoi.k jklk;fud fØ;k,
vehUl& oxhdj.k] ukedj.k] ljpuk] ikFkfed f}rh;d rFkk rrh;d vehuk dh igpkuA

lkbukbMl rFkk vkblk lkbukbMl & jklk;fud vfHkfØ;k,A
Mk;ktkfu;e yo.k & dkcfud l'y"k.k e 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 .

bdkb &15 ck;k ekyhD;Yl ¼to v.k½
dkckgkbMVl & ekuk ldVkbMl ½xydkt] ÝDVkt½
vkyhxk ldVkbMl & ¼lØkt] yDVkt] ekYVkt½
ikyh ldVkbMl & ¼LVkp] lY;ykt½] egRo

ikVhUl & vYQk] vehuk vEy] vko';d vehuk vEy] ilVkbM cU/k] ikyh ilVkbMl] ikVhUl dh ikFkfed f}rh;d] rrh;d ,o pr"dh; ljpuk ¼doy x.kkRed Kku½
foVkfeUl & jklk;fud uke ,o l= rFkk oxhdj.k
U;fDybd vEy & DNA rFkk RNA

bdkb&16 nfud thou e jlk;u & vk"kf/k;k e jlk;u & nn fuokjd] i'kkrd] ifrjk/kh] jkxk.kuk'kh] thok.k uk'kh] mojrkjk/kh nok,] ifrtfod] vEyrkjk/kh] ,UVh fgLVekbUlA
lkcu rFkk viektd & vrj] fØ;kfof/k] dhV ifrd"khA

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 v'k i<ku d lEc/k e dN l>ko

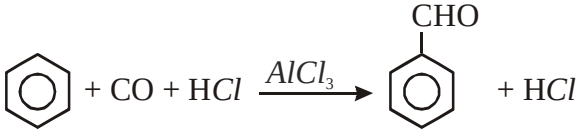
pfd Nk= gkb Ldy mRrh.k gkdj d{kk 11 oh e tc foKku ldk; e io'k yr g rc gkbLdy Lrj dh foKku dh ryuk e ikB;Øe e tehu vkleku dk vrj ikdj ?kcjku yxr gA fo'k"kdj jlk;u'kkL= e vf/kdk'k ckr Lefr ¼jVuh½ e j[kuh gkrh g D;kfd fo'k"k n'kkvk e gh fdlh jlk;fud vfHkfØ;k }kjk fo'k"k inkFkk dk fuek.k lEHko gkrk g vr% bu n'kkvk dk ;kn j[ku d vfrfjDr vkj dkb mik; ugh gA ,lh fLFkfr e Nk=k dk d{kk 11oh d{kk e io'k yu mijkr loiFke vkor lkj.kh dh ogn pkV d }kjk leg ,o vkor e x.kk dh lekurk ,o bu x.kk e Øferk crku d lkFk gh bud byfDVkfud foU;kl vo'; cryk; tku pkfg;A bu byfDVkfud foU;kl d vk/kkj ij ijek.k vkdkjk e o'f) s, p, d, f vkfoVyk dh mifLFkfr d vk/kkj ij s, p, d rFkk f Cykdk e foHkktu dk Hkyh Hkkfr le>k;k tkuk pkfg;A mnk- d fy; 15 o leg d N }kjk ijek.k vkdkj NkVk gku dh otg l doy NCl_3 gh curk g tcfd blh leg e vxy rRo *P*-QkLQkjl }kjk PCl_3 rk curk gh g ;g vkdkj e N dh ryuk e cMk gku d dkj.k PCl_5 Hkh vklkuh l cuk yrk gA nljk dkj.k P d ikl d&d{kd dh mifLFkfr Hkh crykb tkuk pkfg;A bl fjDr d&vkjfoVy dk s vkjfoVy l byfDVku feyu ij 5 vk;fXer byfDVku ikIr gkuk gA 16 o leg e O rFkk S d x.kk e Hkh Øfed vrj vkrk g H d lkFk O ty ¼H_2O½ cukrk g vkj S ¼x/kd½ H d lkFk H_2S cukrk gA H_2O ¼ty½ no voLFkk e gkrk g ijUr mUgh n'kkvk e H_2S xl gkrh gA dkj.k O dk ijek.k vkdkj S dh ryuk e NkVk gkuk Li"V dj Nk=k e fo"k; d ifr :fp ink dh tku dk i;kl gkuk pkfg;A vkdkj NkVk gku ij HcU/k vklkuh l cuuk no voLFkk d fy; ftEenkj gk tkrk gA S dk cMk vkdkj gku l H cU/k ugh cu ikrk rFkk v.k nj&nj jgu d dkj.k vkilh vkd"k cy de gk tku l ;g xl :i y yr gA

vkor lkj.kh d rRok d byfDVkfud foU;kl le>kr le; d{kdk e v/kifjr rFkk i.k :i l Hkj g, byfDVkuk d LFkkf;Ro d ckj e Hkh fo'k"k :i l Nk=k dk /;ku vkdf"kr fd;k tkuk pkfg;A lØe.k rRok d ckj e d&d{kd d byfDVkuk dk Åtk iku ij vU; vxy d{kdk e io'k gku d dkj.k ifjorh l;ktdrk n'kku lc/kh dkj.k

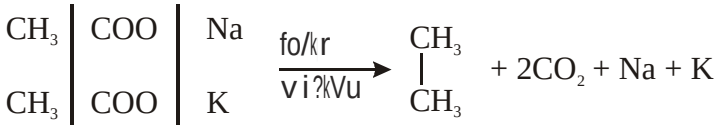
Hkh Li"V fd;k tkuk pkfg;] lkFk gh v/k ifjr d{kd gku ij LFkkf;Ro xg.k dj yu d dkj.k bu rRok }kjk l[;k e dN de ifjorh l;k tdrk, n'kku dk dkj.k le>k;k tk ldrk gA

dkcfud jlk;u dk vkjHk djr le; C dh C d lkFk Hkh vf/kd cU/krk gku l yEch&yEch J[kyk oky vkj [kyh rFkk cn J[kyk oky ;kfxdk dk fuek.k dj lokf/kd ;kfxdk dk cukuk ,d dkj.k gA bl Nk=k dk Li"V :i l le>k;k tk,A

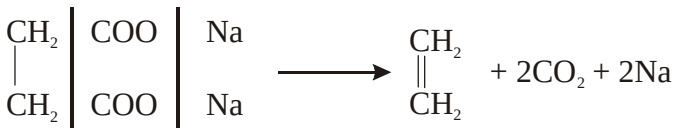
tc dkcfud jlk;u i<k;k tk; rc bld ey e=k tl ;kfxdk e C dh l[;k c<kuk] ?kVkuk] ,Yduk e –OH, –CHO, –COOH, $–NH_2$, $–CO.NH_2$, –CN , –N≡C vkj NO_2, $–HSO_3$ vkfn legk dk yku fo"k;d lkekU; fØ;kvk l voxr djku dk vH;kl djk;k tk; rk Nk= jlk;u d lkekU; ink l ifjfpr gkdj ie[k :i l iN tku oky egRoi.k ifjoruk dk i.k dju e vkRe fo'okl yk ldx vkj bll dkcfud jlk;u jkpd cuxhA ,l gh dN iØek e i;Dr inkFkk d }kjk fØ;k, lEHko gb] ftu jlk;uKk u ; n'kk, Kkr dh mud uke l mu iØek dk tkuk tku yxk mnk- Pd rFkk $BaSO_4$ dh mifLFkfr e H_2 d }kjk fd;k x;k vip;u **jktue.M vfHkfØ;k**] KOH rFkk Br_2 }kjk& $CO–NH_2$ leg dk $–NH_2$ leg e ifjoru **gkQeu ckekbM** vfHkfØ;k] veyxeVM ftd rFkk lkUn *HCl* }kjk ikIr H–H l >C=O leg dk CH_3 e ifjofrr djuk **DyhelU lu vip;u**] futy $AlCl_3$ dh mifLFkfr e cUthu fjx e ,Ydkby vFkok ,lkby leg dk io'k djkuk **ÝhMyØk¶V vfHkfØ;k** d uke l tkuh tkrh g bl fof/k }kjk mPp gkbMkdcuk dk fuek.k fd;k tk ldrk gA blh idkj cUthu fjx l tMh ik'o J[kyk dk vkf'kd vkDlhdj.k bVkM vfHkfØ;k dgykrk gA Zn/kkr dh mifLFkfr e nk ,Ydkby gdkbMk d legk dk l;kx djk mPp lrlr gkbMkdkcu cukuk **Ýdy.M vfHkfØ;k** dgyk;kA ÝhMyØk¶V vfHkfØ;k dk foLrkj djr g, **xVjeu&dkp** u $AlCl_3$ dh mifLFkfr e cUthu fjx e –CHO leg tkM fn;k bl xVjeu&dkp vfHkfØ;k d uke l tkuk x;kA mnk-



dkYc u dkcfud vEyk d lkfM;e vFkok ikVf'k;e yo.kk d tyh; foy;u dk fo|r vi?kVu dj lLrlr vFkok vlrlr lxr gkbMkdkcuk dk l'y"k.k lHko cuk;k blfy; mlh d uke ij bl **dkYc l'y"k.k** dgk tku yxkA mnk-



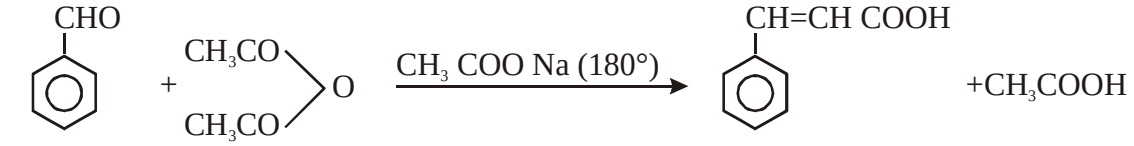
tyh; foy;u



tyh; foy;u

tyh; foy;u gku l K, Na /kkr fØ;kdj KOH ;k NaOH dk fuek.k dj yrh gA

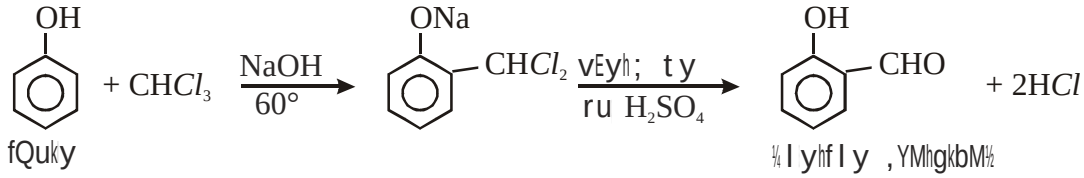
fdlh ,jkefVd vYMhgkbM dh fdlh ,l ,yQfVd vEy ,ugkbMM l ft le nk vYQk gkbMk tu ijek.k gkr gk mlh ,yhQfVd vEy d lkfM;e yo.k dh mifLFkfr e vfHkfØ;k djku ij vlrlr vEy ikIr gkrk gA ;g i;kx ijfdu oKkfud u fd;k blfy; bl vfHkfØ;k dk **ijfdUl vfHkfØ;k** uke fn;k x;kA mnk-



cUt YMhgkbM ,yhQfVd ,ugkbMkbM ¼,lhfVd ,ugkbMkbM½ vlrlr vEy ¼flufed vEy½

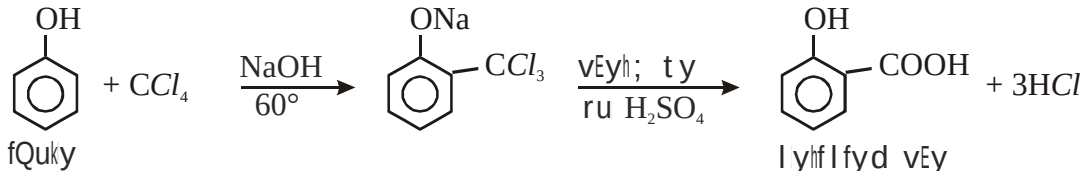
jhej&Vheu

bu jlk;uKk u fQuky d {kkjh; fo;u dh Dykjk Qke l fØ;k 60° rki ij djkd ikIr inkFk dk vEyh; ty d lkFk vi?kVu fd;k ft ll lyhflyd ,YMhgkbM ikIr gvkA bl vfHkfØ;k dk mUgh d uke l tkuk x;k mnk-



fQuky ¼lyhfly ,YMhgkbM½

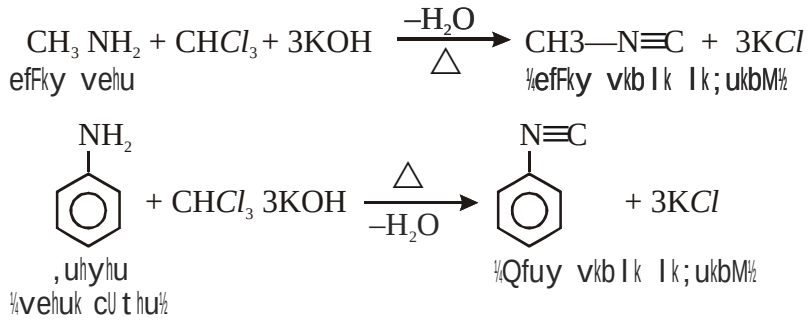
tc Dykjk Qke ($CHCl_3$) d LFkku ij dkcu VVkDykjkbM (CCl_4) dk mi;kx fd;k x;k rc lyh lYMhgkbM d LFkku ij lyhflfyd vEy ikIr gvkA



oVt }kjk lkfM;e /kkr d lkFk ,Ydkby gykbMl dk bFkjh; foy;u xe fd;k x;k rk mPp ,Ydu ¼lrIr gkbMkdkcu½ ikIr g,A bl **oVt vfHkfØ;k** uke fn;k x;kA

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

dN ,l mnkgj.k g tk oKkfud d uke l ugh tku tkdj cu inkFk d uke l tku tkr gA mnk- dkckby vehu vfHkfØ;kA bl vfHkfØ;k e ¼Dykjk Qke½ dh dN cn ,uhyhu e feykdj vYdkgyh KOH d lkFk xe dju ij cncnkj vkblk lkbukbM ¼dkckby vehu½ curk gA doy ikFkfed vehu gh ;g vfHkfØ;k n'kkr g blfy; ikFkfed vehuk dh igpku gr ;g egRoi.k vfHkfØ;k ekuh xb gA



gykQke vfHkfØ;k&

,l vYdkgy ftue 2C oky (CH_3—CH–Hkkx) vFkok nk dkcu oky dkckukby ;kfxd (CH_3–CO–Hkkx) tc fdlh {kkj dh mifLFkfr e gykrk tk (Cl_2, Br_2, I_2) d lkFk xe fd, tkr g rk cuu oky Dykjk Qke] ckekQke vFkok vk;kMk Qke lfEefyr :i l gykQke dg tkr g vkj bl lkekU; vfHkfØ;k dk gykQke vfHkfØ;k d uke l tkuk tkrk gA

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

Dykjk Qke

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

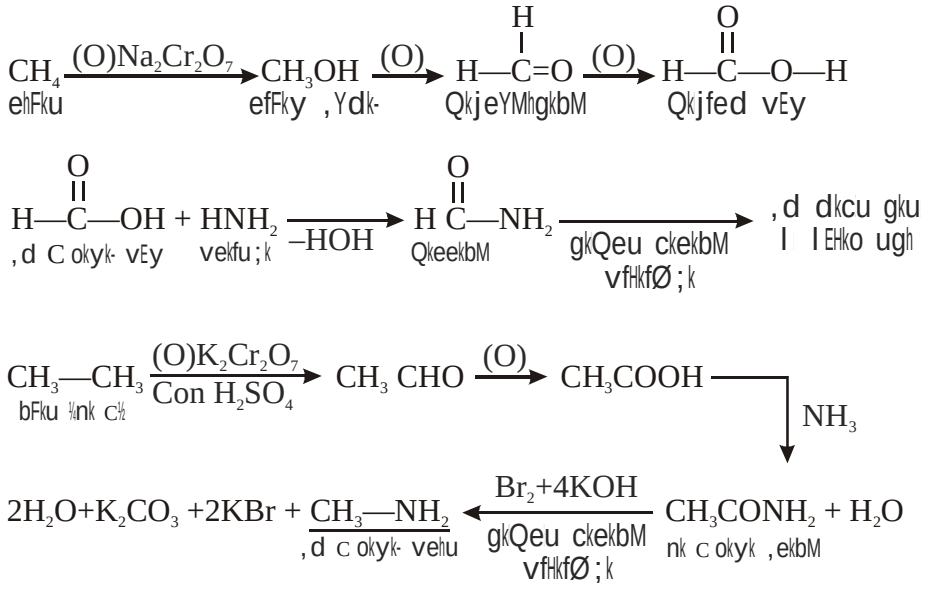
vk;kMk Qke

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

gyk Qke

egRoi.k ifjoru yku gr ;fDr;k

1- ,d dkcu oky ,Ydu l vYdkgy] vYMhgkbM] dkckfDlfyd] vEy] vehu vkfn cuku gr fuEu rduhd viukb tk ldrh gA



gkQeu ckekbM vfHkfØ;k d viuku l cuu oky ;kfxd e ,d dkcu dh deh gk tkrh g vr% tgk Hkh >CO leg dk gVkuk gk ;g fØ;k djkb tk ldxhA bl ink e bl idkj n'kk;k tkuk Nk=k dk crk;k tk;

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 leg dk vYdkgyh (–OH) leg e cnyuk gk rk bld fy; en vkDlhdj.k djuk gkrk g vU;Fkk vYdkgy d lkFk dN ek=k vYMhgkbM dh Hkh cuxhA en vkDlhdkjd $NaNO_2/HCl$ gA

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

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

3- tc C dh l[;k fdlh ;kfxd e c<kb tkuh gk rk fuEu rduhd viukb tk ldrh gA

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

4- dkcu l[;k c<ku dh nljh fof/k oVt vfHkfØ;k Hkh g ble fdlh ,Ydu d ekuk gykbM cukdj bFkj e lkfM;e d lkFk ; gykbM feyku ij gykbMk d nk v.k feydj vf/kd dkcu oky gkbMkdkcu e cny tkr gA mnk-

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

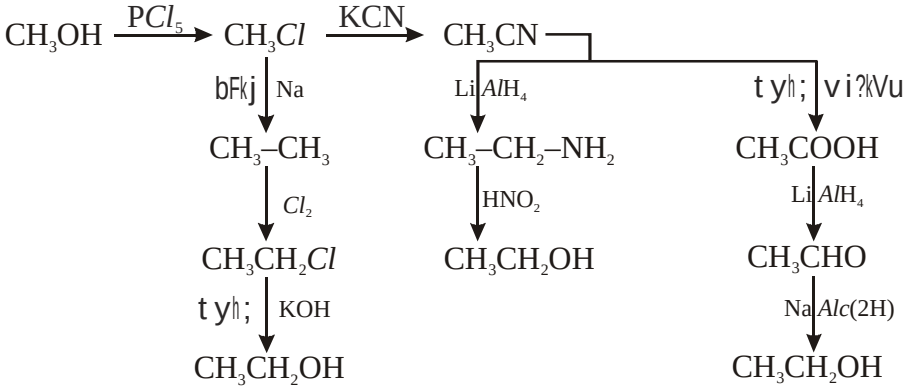
bl fof/k l ehFku dk bFku e bFku dk ikiu e cnyuk vklku gk tkrk gA mnk-

5- tc C dh l[;k fdlh ;kfxd e de dh tkuh gk rk igy ml inkFk l vekbM (R-CONH2) cukuk gkxk vkj vekbM ij gkQeu ckekbM vfHkfØ;k djkd bl R–NH_2 (vehu) e cny fy;k tk;xk ble ,d dkcu de jgxkA vc bl vehu l vkx pkg vulkj vYdkgy ;k vYMhgkbM ;k vEy ;k vEy Dykjkbd ;k vEy ,ugkbMkbM vkfn bPNkulkj cuk; tk ldr gA

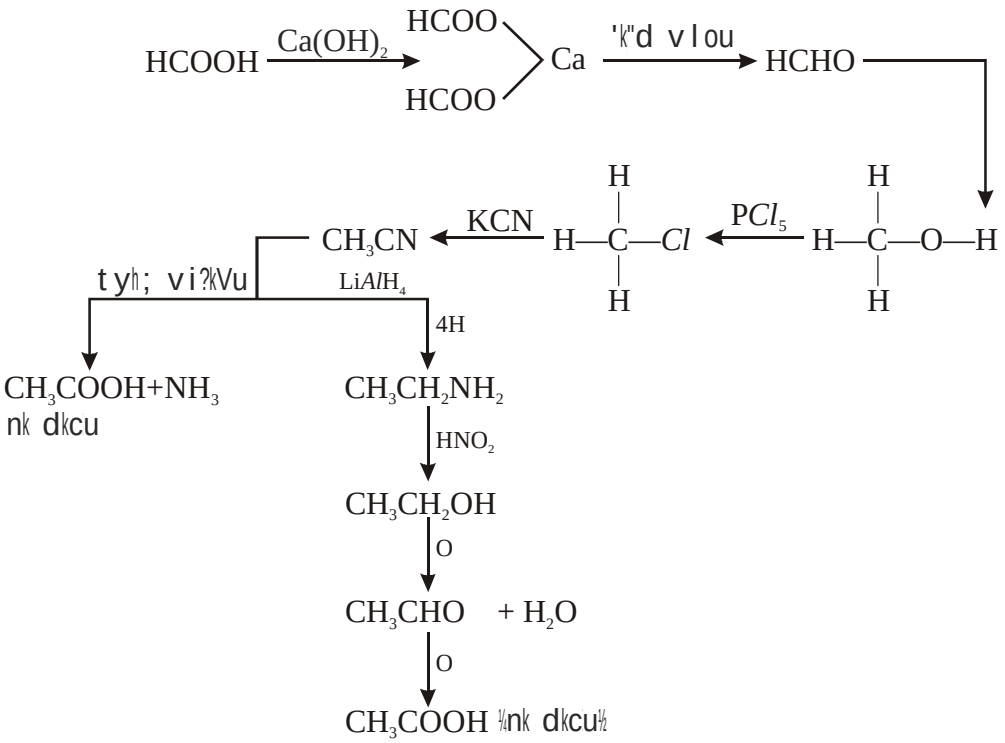
$$CH_4 \xrightarrow{Cl_2} CH_3Cl \xrightarrow[-NaCl]{Na(bFkj)} \underset{\text{bFku}}{CH_3–CH_3} \xrightarrow{Cl_2} CH_3CH_2Cl \xrightarrow[+CH_3–Cl]{Na(bFkj)} \underset{\text{ikiu}}{CH_3–CH_2–CH_3}$$

$$C_2H_6 \xrightarrow{Cl_2} C_2H_5Cl \xrightarrow[-KCl]{KCN} C_2H_5CN \xrightarrow{\text{जल अपघटन}} NH_3\uparrow + C_2H_5COOH \xrightarrow[-H_2O]{LiAlH_4,\ (bFkj)} C_2H_5CH_2OH \xrightarrow{P(yky)/HI} \underset{\text{ikiu}}{C_2H_5CH_3}$$

6- de dkcu oky vYdkgy l vf/kd dkcu oky vYdkgy e ifjoru dju d fy; fuEu ifØ;k viukb tk ldxhA



;fn vEyk e dh l[;k c<kuh gk rc fuEu ifØ;k dk viuk;k tk ldrk gA



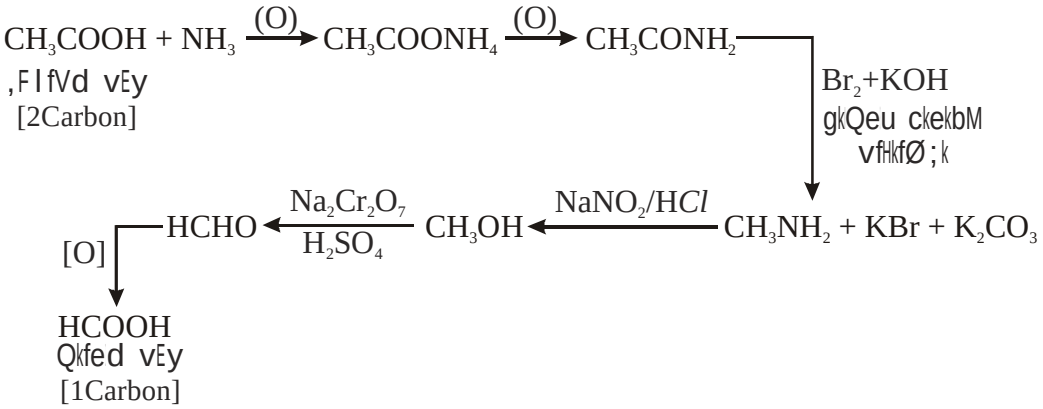
7- ,flfVyhu l fuEu inkFkk d cuku gr viukb tku okyh ;fDr;kA

ukV& ;kn j[kk tk, fd tc Hkh $-NH_2$ leg dk –OH e cnyuk gk $NaNO_2$ rFkk HCl l fØ;k djkA

2 v- ,d dkcu oky dkckfDlfyd vEy l 2 dkcu okyk vEy cukuk mnkgj.k

Qkfed vEy (HCOOH) l CH_3COOH vEy

2 c- nk dkcu oky dkckfDlfyd vEy l ,d dkcu okyk vEy cukuk ¼v- dk foijhr½



i'u&i= CyfiUV

BLUE PRINT OF QUESTION PAPER

ijh{kk % gk;j ld.Mjh

d{kk % XII i.kkd % 75

fo"k; % jlk;u 'kkL= le; % 3 ?k.V

l-Ø-	bdkb	bdkb ij vkofVr vd	vdokj i'uk dh l[;k			dy i'u
			oLrfu"V 1 vd	4 vd	5 vd	
1	Bkl voLFkk	04	1$1$1$1	&	&	&
2	foy;u	06	1	&	1	1
3	fo|r jlk;u	06	1	&	1	1
4	jklk;fud cyxfrdh	05	1	1	&	1
5	lrg jlk;u	04	1$1$1$1	&	&	&
6	dN /kkrvk dk fu"d"k.k ,o mud ie[k ;kfxdk dk v/;;u	05	1	1	&	1
7	*P*&Cykd d rRo I	05	1	1	&	1
8	*P*&Cykd d rRo II	05	1	1	&	1
9	*d* ,o *f*&Cykd d rRo	06	1	&	1	1
10	milgl;kth jlk;u	04	&	1	&	1
11	gyk ,Ydu ,o gyk,jhu	04	&	1	&	1
12	vYdkgy fQuky ,o bFkj	04	&	1	&	1
13	vYMhgkbM] dhVku rFkk dkckfDlfyd vEy	04	&	1	&	1
14	ukbVk tu ;Dr dkcfud ;kfxd	03	1$1$1	&	&	&
15	to v.k	05	1	1	&	1
16	Infud thou e jlk;u II Hkkjr d ikphu oKkfud ,o oKkfud lLFkku	05	1	1	&	1
	;kx ¾	**75**	**½20½ 4**	**10**	**3**	**13$4¾17**

ukV& ,l vud CyfiV gk ldr gA ftu bdkb;k l oLrfu"V iN x; gA vU; CyfiV e l vU; bdkb;k l Hkh iN tk ldr gA bl idkj fdlh Hkh bdkb l oLrfu"V i'u iN tk ldr gA

ikn'k i'ui=

le; % 3 ?k.V **i.kkd % 75**

i'u&1 cgfodYih i'u

v thjk dfYou ij vf/kdk'k vk;fud fØLVyk e mifLFkr gkrk gA **5 vd**

(a) ÝUdy nk"k (b) 'kkVdh nk"k

(c) /kkr vkf/kD; nk"k (d) dkb nk"k ugh

c ikVf'k;e bcc pkyd e fØLVyhdr gkrk g] vr% ikVf'k;e /kkr e K dh leU;o;u l[;k gkxhA

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

l ldjhu D;k g

(a) ifjj{kd (b) feBkl ink dju okyk inkFk

(c) i'kkUrd (d) nn fuokjd

n fjdVl gfMM;k dk jkx fdl foVkfeu dh deh l gkrk gA

(a) foVkfeu D (b) foVkfeu K

(c) foVkfeu C (d) foVkfeu A

b tc vfHkfØ;k A+B ⇌ AB e A dh lkUnrk nxuh dju tk; rc vfHkfØ;k dk ox gkxkA

(a) pkxuk (b) nxuk (c) vifjofrr (d) vk/kk

i'u&2 fjDr LFkku dh ifr djkA **5 vd**

(a) dkp ,d ---------- Bkl gA

(b) rki c<ku ij v/kpkydk dh pkydrk ---------- gkrh gA

(c) lkMk okVj ---------- foy;u gA

(d) ekud gkbMkt u dk byDVkM foHko ---------- gkrk gA

(e) fV.My iHkko dkyk;Mh d.kk d idk'k e ---------- }kjk gkrk gA

i'u&3 tkMh cukvkA **5 vd**

(a) ik;l (a) vk;ju

(b) fo"kekx rU= (b) fejcu dk ry

(c) geVkbV (c) nxU/k ;Dr ok"i'khy no

(d) ukbVkcUthu (d) dkykbMh foy;u

(e) vkblk lkbukbM (e) ty e ry

i'u&4 ,d 'kCn e mRrj nhft ;A **5 vd**

(a) vo{kh dk dkyk;Mh foy;u e ifjoru dgykrk gA

(b) PCl_3 dh vk—fr gkrh gA

(c) jfM;k,fDVo gykrtu dk uke crkb;A

(d) no voLFkk e ik; tku oky lØe.k /kkr dk uke crkvkA

(e) fdl vfHkfØ;k d vfre mRiku e dkcu J[kyk e ,d dkcu ijek.k de gkrk gA

i'u&5 vfHkfØ;k dk v) vk; dky l D;k le>r gkA iFke dkfV vfHkfØ;k d v)vk;dky d fy; l= 0;RiUu dhft ;A **4 vd**

vFkok

idk'k jklk;fud vfHkfØ;kvk d pkj mi;kx fy[kA

i'u&6 QkVkxkQh D;k g] bl fuEu fcUnvk d vk/kkj ijk le>kb;A **4 vd**

1 lxkrh lyV dk fuek.k 2 Moyfix

vFkok

feJ /kkr l D;k le>r gk] dkij dh rhu feJ /kkrvk dk l?kVu u mi;kx fy[kk\

i'u&7 SO_2 vkj Cl_2 dh fojtu fØ;kvk e vUrj fy[kk\ **4 vd**

vFkok

rkc d lkFk ukbfVd vEy dh fØ;kvk dh lehdj.k nhft ;\

i'u&8 dkj.k fy[kkA **4 vd**

1 HF dk dkp dh ckry e ljf{kr ugh j[kk tkrk g \

2 'kU; ox d rRo lkekU; ifjfLFkfr;k e ;kfxd ugh cukr \

vFkok

1 mR—"V xlk dh vk;uu Åtk lokPp gkrh g \

2 leg 17 d rRo icy vkDlhdjd gkr g \

i'u&9 Li"V dhft ; fd $Ni(CO)_4$ pr"Qydh; g] tcfd $[Ni(CN)_4]^{-2}$ ox leryh; g] D;k \ **4 vd**

vFkok

$[Fe(CN)_6]^{-3}$ ncy vupEcdh; g] tcfd $[Fe(CN)_6]^{-4}$ ifr pEcdh; g] D;k \

i'u&10 fuEufyf[kr ij lehdj.k lfgr fVli.kh fy[kkA **4 vd**

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

vFkok

fuEufyf[kr ij lehdj.k lfgr fVli.kh fy[kk &

1 DDT 2 BHC

i'u&11 i;kx'kkyk e Mkb,fFky bFkj cuku dh fof/k dk o.ku fuEu fcUnvk ij dhft;A **4 vd**

1 fp= 2 lehdj.k 3 fof/k

vFkok

'khj }kjk ,fFky ,Ydkgy cuku dh fof/k dk o.ku fuEu fcUnvk ij dhft;A

1 ok'k dk cuuk 2 ok'k dk vklou 3 ifj'kk/ku

i'u&12 QkeYMhgkbM l fuEu dk ikIr dhft;A **4 vd**

1 ;jkVkfiu 2 ijkQkeYMhgkbM

3 cdykbV 4 eFkuky

vFkok

,lhfVd vEy l fuEu dk ikIr dhft;A

1 ,flfVd ,ugkbMkbM 2 eFku

3 ,lhVku 4 ,lhVekbM

i'u&13 ikVhu dk fuEu fcUnvk d vk/kkj ij le>kb;A **4 vd**

1 ikFkfed ljpuk 2 fo—frdj.k

vFkok

DNA o RNA e pkj vUrj fy[kkA

i'u&14 Hkkjr d nk ikphu oKkfudk d ckj e fyf[k;A **4 vd**

vFkok

fdUgh pkj vk"k/kh; ik/k d okLrfod uke o mudk ,d&,d mi;kx fy[kA

i'u&15 1 DoFkukd e mUU;u D;k g \ **5 vd**

2 ,d tyh; foy;u –0.186°C ij terk gA DoFkukd mUu;u Kkr dhft; (K_a = 1.86K, Kg mol^{-1}, K_b = 0.0512K Kg mol^{-1})

vFkok

1 ijklj.k nkc D;k g]

2 300 K ij ;fj;k d ml foy;u dk ijklj.k nkc Kkr dhft;] ftld

1 yhVj e 6 xke ;fj;k gA
(R=0.0821 yhVj ok;e.Myh; fMxh–1 eky–1 ;fj;k dk v.kHkkj¾60)

i'u&16 vfHkfØ;k dh nj D;k g] bldk iHkkfor dju oky pkj dkjd fy[k \ **5 vd**

vFkok

ngyh Åtk vk lfØ;u Åtk dk le>kb;] rFkk budk vkil e lEcU/k crkb;A

i'u&17 yUFkukbM ldpu D;k g] bll yUFkukbM ij iMu oky iHkko] dkb rhu **5 vd**
iHkko le>kvkA

vFkok

3D rRok fuEu x.kk dk Li"V dhft ;&
1 mRijdh; x.k 2 jxhu vk;u

vkn'k mRrj

i'u- 1

¼1½ ¼i½ dkb nk"k ugh

¼ii½ 8

¼iii½ feBkl ink dju okyk inkFk

¼iv½ foVkfeu D

¼v½ nxuk

¼2½ ¼i½ vfØLVyh;

¼ii½ of)

¼iii½ xl dk no e

¼iv½ 'kU;

¼v½ idh.ku

¼3½ ¼i½ ty e ry

¼ii½ dkykbMh foy;u

¼iii½ vk;ju

¼iv½ fejcu dk ry

¼v½ nxU/k;Dr ok"i'khy no

¼4½ ¼i½ ilVhdj.k

¼ii½ f=dk.kh; fijkfeM

¼iii½ ,LVVhu

¼iv½ ikjk ¼ejdjh½

¼v½ gkQeu ckekbM vfHkfØ;k

i'u 5

mRrj & v) vk;dky & og le; ftle fØ;kdkjd dh lkUnrk mldh ikjfEHkd lkUnrk dh vk/kh jg tkrh g vFkok og le; ftle dkb fØ;k v)i.k gkrh g ml bl fØ;k dk v) vk;dky dgr gA bl t½ l inf'kr djr gA iFke dkfV d fy, bldk ek=d feuV gkrk gA

iFke dkfV vfHkfØ;k d fy, l=

iFke dkfV vfHkfØ;k d fy; lekdfyr nj lehdj.k fuEu gkrk gA

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

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

$$t_{1/2} \text{ ij } x = \frac{a}{2}$$

$$t_{1/2} = \frac{2.303}{K} \log \frac{a}{(a-a/2)}$$

$$t_{1/2} = \frac{2.303}{K} \log 2$$

$$t_{1/2} = \frac{2.303}{K} \times 0.3010 \quad [\because \log 2 = 0.3010]$$

$$t_{1/2} = \frac{0.693}{K}$$

iFke dkfV vfHkfØ;k d fy, v) vk;dky dk eku nj fLFkjkd d 0;rØekuikrh gkrk g

vFkok

idk'k jklk;fud vfHkfØ;k d pkj mi;kx

1- idk'k jklk;fud vfHkfØ;k,] lkyj Åtk inku dju dk ,d ek= lk/ku gA l; l ikIr Åtk dk jklk;fud Åtk d :i e ,df=r djd bldk fofHkUu :ik e i;kx fd;k tkrk gA

2- jlk;u m|kx e vud cgyhdj.k fØ;kvk rFkk dkcfud ;kfxdk d l'y"k.k e idk'k mRijd dk dk; djrk gA

3- QkVkxkgh v) pkyd byDVkMk dh lgk;rk l ty dk idk'k o|r vigkl djd gk;Mktu b/ku cuk;k tkrk gA

4- vud vk/kfud ik|kfxdh idk'k jklk;fud fØ;kvk ij vk/kkfjr g QkVkxkQh] QkVk fifVx] jxhu QkVkxkQh vkfnA bld vfrfjDr vU; mi;kx Hkh fy[k tk ldr gA

i'u 6

mRrj & idk'k dh mifLFkfr e oLrvk d fp= vfdr dju dk QkVkxkQh dgr g ;g flYoj gykbM d idk'k d ifr lxkfgrk ij fuHkj djrk gA

1- lxkgh lyV dk fuek.k ftyfVu ;Dr vekfu;e ckekbV d ?kky e flYoj ukbVV dk vekfu;ke; foy;u feykr g ftll flYoj ckekbM vfr eghu d.kk d :i e vo{kfir gk tkrk g feJ.k dk yxHkx 45° ij dN le; d fy, j[k nr gA ftll AgBr d d.k cM gkdj mfpr vkdkj d cu tkr gA bl idkj AgBr dk ftyfVu e ,d beYlu cu tkrk gA vc dkp dh lyV ij yky idk'k dh mifLFkfr e beYlu dh

,d iryh ijr tek nh tkrh g bl idk'k dh vU; fdj.kk d ifr lxkgh cuku d fy, ftyfVu e fo'k"k idkj d jtd feyk fn; tkr gA lHkh jxk dh fdj.kk dk iHkkfor dju okyh lyV dk iuØkefVd lyV dgr gA

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

2- Moyfix QkVkxkfQd lyV dk yky idk'k e dej l fudkydj (Developer) if"Vdkjd e Mkyk tkrk g M0yij ik;jkxyky fDouky gkbMkfDouky ;k ,feMky t l vipk;dk dk {kkjh; ?kky gkrk g ;g idk'k }kjk ikjHk gb AgBr l Ag vip;u dh fØ;k dk i.k dj nrk gA lyV e ftu Hkkxk ij idk'k iMrk g ogk flYoj dh dkyh rg te tkrh gA bl idkj oLr dk pedhyk Hkkx lyV dh voLFkk e dkyk gkrk g vkj dkyk Hkkx lQn gkrk gA vr% oLr dk i.k mYVk fp= lyV ij ikIr gkrk gA

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

fDouky

vFkok

feJ /kkr & ;g nk ;k nk l vf/kd /kkr ;k v/kkr dk lHkkxh feJ.k gA feJ /kkr, viu tud /kkrvk dh ryuk e vf/kd dBkj] vf/kd xyukd okyh rik vf/kd l{kkj.k ifrjk/kh gkrh gA rkc dh feJ /kkr,

l-Ø-	feJ /kkr dk uke	lxBu	mi;kx
1-	ihry	Cu-66 l 28 % Zn- 20 l 40 %	cru ,o efr;k cuku e
2-	dkIk	Cu-80 l 90 % Sn-10 l 25 %	efr;k] flDd o e'khu cuku e
3-	xu eVy	Cu-88 % Sn-10 % Zn- 2 %	rki] cUnd cuku e

bud vykok vU; feJ /kkr, fy[kh tk ldrh gA

i'u 7

mRrj & Dykjhu dk fojtu vkDlhdj.k }kjk gkrk g tcfd bld foijhr lYQj MkbvkDlkbM dk fojtu vip;u }kjk gkrk gA

Dykjhu dk fojtu LFkk;h gkrk gA

$$Cl_2 + H_2O \longrightarrow HCl + HO_4$$
$$HOCl \longrightarrow HCl + [O]$$
jxhu inkFk + [O] ⟶ jxghu inkFk

SO_2 dk fojtu vLFkk;h gkrk g D;kfd o jxghu inkFk ok;e.My dh vkDlhtu l vkDlhdr gkdj iu% jxhu gk tkrk g &

$$SO_2 + 2H_2O \longrightarrow H_2SO_4 + 2[H]$$
jxhu inkFk + [H] ⟶ jxghu inkFk

$$\text{jxghu inkFk} \xrightarrow[[O]]{} \text{jxhu inkFk}$$

vFkok

rkc dh ukbfVd vEy l vfHkfØ;k, &

1- B.M ,o 20 l 25 ifr'kr lkUn HNO_3 l

$4Cu + 10HNO_3 \longrightarrow 4Cu(NO_3)2 + 5H_2O + H_2O$ ukbVl vkDlkbM

2- B.M ,o 35 l 45 ifr'kr lkUn HNO_3 l

$3Cu + 8HNO_3 \longrightarrow 3Cu(NO_3)2 + 4H_2O + 2NO$ ukbfVd vkDlkbM

3- B.M ,o 50 ifr'kr lkUn HNO_3 l

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

4- 50 ifr'kr lkUn rFkk xe HNO_3 l

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

i'u 8

mRrj & (a) HF dk dkp dh ckry e ljf{kr ugh j[kk tkrk g D;kfd og dkp dh ckry d dkp l fØ;k dj ml ?kkyk nrk g

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

vkj Sodium Flourosilicate cukrk gA

(b) 'kU; ox ¼vkn'k xl½ d lHkh ijek.k d lHkh dk'k i.kr% Hkj gkr gA ghfy;e dk NkMdj lHkh xlk dh ckâ;r; d{k e LFkk;h v"Vd 0;oLFkk ns^2np^6 gA ghfy;e e $1S^2$ LFkk;h foU;kl gA

1 'kU; xlk d ijek.k e dkb v;fXer byDVku ugh gA vr% ; rRo jklk;fud cU/k ugh cukrA

2 mPp vk;uu Åtk d dkj.k byDVku R;kx dj /ku vk;u ugh cukrA

3 mi{k.kh; byDVku cU/krk d dkj.k ; byDVku xg.k ugh djr vkj _.kk;u ugh cukrA

vFkok

1 mR—"V xlk dh vk;uu Åtk vf/kd gkrh g D;kfd bu xlk dk byDVkfud foU;kl i.k Hkjk ,o LFkk;h gkrk gA ftll bue l byDVku fudkydj vk;u cuku d fy; vk;uu Åtk cgr vf/kd yxrh gA blfy; ;g vfØ; gkr gA

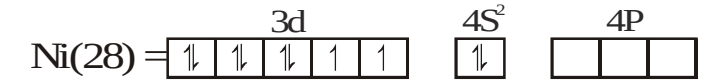
2 leg 17 d rRo icy vkDlhdkjd gkr g D;kfd bu rRok dh byDVku cU/krk vf/kd gkrh gA vr% bue byDVku xg.k dju dh {kerk vf/kd gA bl dkj.k ;g icy vkDlhdkjd gkr gA

i'u 9

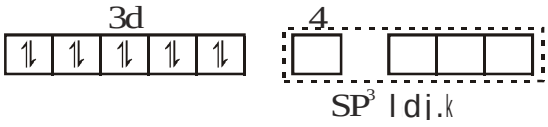
mRrj & (a) $[Ni(CO)_4]$ pr"Qydh; g tcfd $[Ni(N)_4]^{-2}$ ox leryh; g D;kfd $[Ni(CO)]$ ldy e /kkr ijek.k :i e gA vr% bldh vkDlhdj.k l[;k 'kU; gA Ni(28) dk ijek.k foU;kl fuEu fyf[kr gA

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

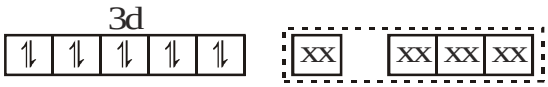
vr% byDVkfud foU;kl g



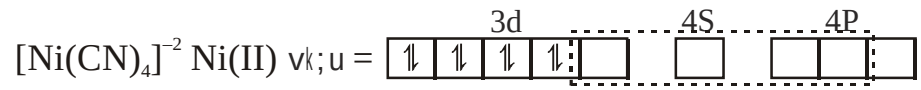
ldj.k d io rFkk cU/k fuek.k d fy; 4S byDVku 3d d{kd e 0;ofLFkr gk tkr g vr%



vr% ldy $[Ni(CO)_4]$° e &



;g SP^3 ldj.k g blfy, pr"Qydh; g tcfd $[Ni(CN)_4]^{2}$ e Ni dh vkDlhdj l[;k +2 gA vr% Ni^{++} dk byDVkfud foU;kl gkxk&



dsp^2 ldj.k d dkj.k ldy dh ljpuk ox leryh; gkrh gA

vFkok

$[Fi(CN)_6]^{-3}$ ncy vupEcdh; g tcfd $[Fe(CN)_6]^{-4}$ ifr pEcdh; g D;kfd $[Fe(CN)_6]^{-3}$ e Qfjd vk;u e vfre RkFkk vfre l ,d d{kk dk byDVkfud foU;kl fuEu fyf[kr gA

Fe^{+3} dk ijek.k Øekd g 26–3^e=23 = $1s^2, 2s^2p^6, 3s^2p^6d^5$

Fe^{+++} vk;u =

;g d^2sp^3 ldfjr d{kd g vr% foU;kl

;gk d^2sp^3 ldfjr d{kd 6 byDVku tkfM;k d fy; i;Dr gkr gA

$[Fe(CN)_6]^{-3}$ आयन =

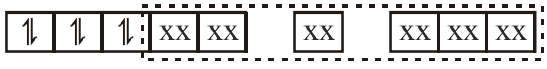
upa
Unpaired Paramagnet अनु.

;gk ij ,d v;fXer byDVku g blfy, ;g ncy vupEcdh; Paramagnetic gA tcfd $[Fe(CN)_6]^{-4}$ e ldfjr Qjl vk;u dk byDVkfud foU;kl

Fe^{++}

;gk ij ldy fuek.k d^2sp^3 ldj.k l gkxkA

$[Fe(CN)_6]^{-4}$

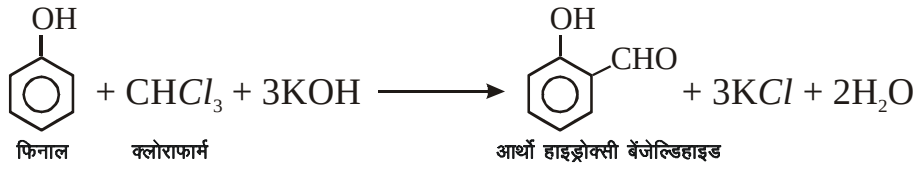


pdp
Paired Diamagnet प्रति.

;gk ij lHkh byDVku ;fXer gA vr% Qjkl;ukbM vk;u dh i—fr ifr pEcdh; diamagnetic gkrh gA

i'u 10

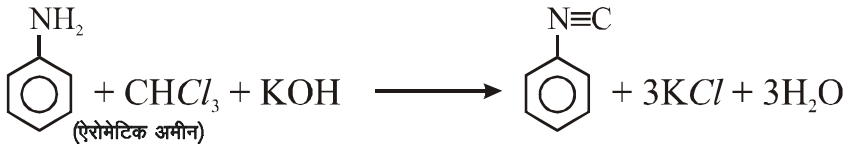
mRrj & (a) **jhej &Vheu vfHkfØ;k** & fQuky dk dkfLVd {kkj dh mifLFkfr e DykjkQke ;k dkcu VVkDykjkbM d lkFk xe dju ij vkFkk ;k ijk gkbMkDlh ,fYMgkbM ;k vEy curk g jhej&Vheu vfHkfØ;k dgykrh gA



(b) **dkfcy ,ehu vfHkfØ;k** & ,fyQfVd ;k ,jkefVd ikFkfed ,ehu dk $CHCl_3$ rFkk ,Ydkgkyh; KOH d lkFk xe dju ij rho nxU/k ;Dr Qfuy vkblkIkbukbM ¼dkfcu,feu½ curk gA

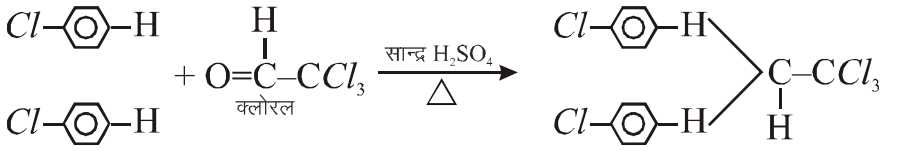
$$C_2H_5NH_2 + CHCl_3 + 3KOH \longrightarrow C_2H_5N{\equiv}C + 3KCl + 3H_2O$$

,yhQfVd vehu



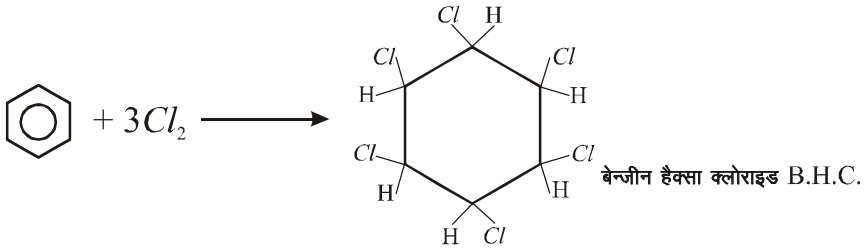
vFkok

(1) D.D.T. ijk & MkbDykjk MkbQfuy VkbDykjk ,Fku bldk jklk;fud uke g bl Dykjk cthu d nk v.kvk dh lkUn H_2SO_4 dh mifLFkfr e Dykjy ¼VkbDykjk ,lhVfYMgkbM½ d lkFk vfHkfØ;k djku ij D.D.T. curk gA



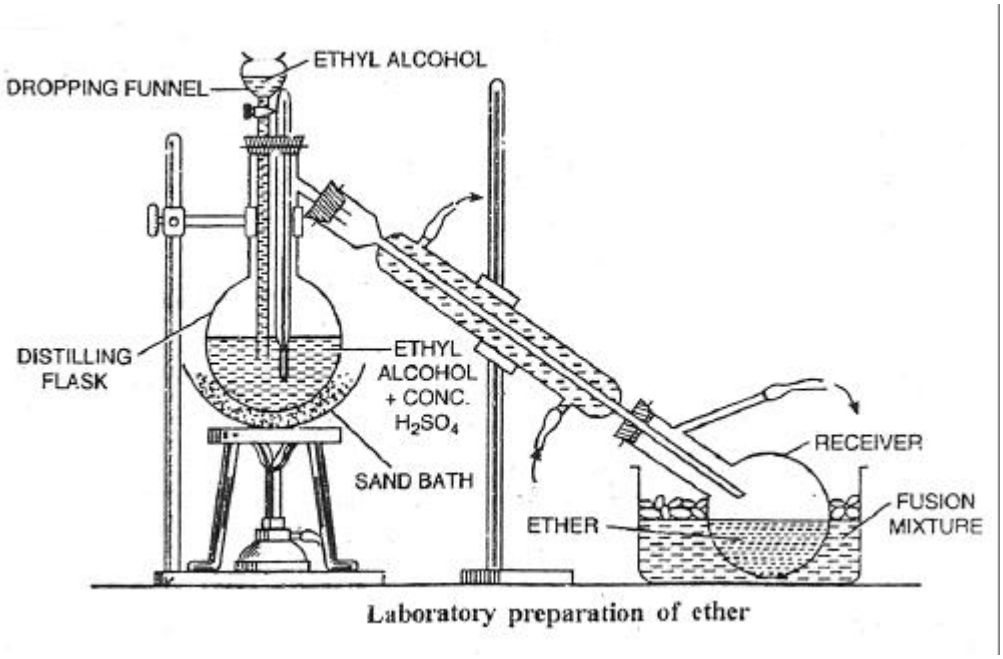
p–p डाइक्लोरो–डाईफेनिल ट्राईक्लोरोएथेन

(2) B.H.C. bldk jklk;fud uke cthu gDlkDykjkbM g cthu dk Cl_2 d lkFk l; idk'k dh mifLFkfr e fØ;k djku ij B.H.C. ikIr gkrk gA bl 666 ;k xeDlu ;k 1]2]3]4]5]6 gDlk DYkkjk lkbDykgDlu Hkh dgr gA



बेन्जीन हैक्सा क्लोराइड B.H.C.

i'u- 11 bFkj cuku dh i;kx'kkyk fof/k %&



Laboratory preparation of ether

mRrj & fp=

lehdj.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 ikVf'k;e MkbØkeV dk 100 ml ty e ?kkydj ,d xky inh d ¶ykLd e yr gA fcUndkjh dhi e 100ml ,Fkuky rFkk 20 ml lkUn H_2SO_4 dk feJ.k y fy;k tkrk g fp=kulkj midj.k r;kj dj ¶ykLd dk ty m"ed ij xe djr g] cuh gb ok"i l?kfu= e l xtjrh gA bl vfHkfØ;k e in (ii) e H_2SO_4 iu% mRiUu gk tkrk g tk C_2H_5OH l in (i) d vulkj fØ;k djd ml iu% bFkj e cnyrk g blfy, bl vfojy bFkjhdj.k dh fof/k Hkh dgr gA

'kk/ku & i;kx'kkyk fof/k l ikIr bFkj e ,Fkuky] ty] o lY¶;fjd vEy dh v'kf);k gkrh gA igy bFkj dk NaOH foy;u l /kkr g ftll lY¶;fjd vEy dh v'kf) nj gk tkrh gA bFkj oky ry dk iFkd djd mle 50 ifr'kr $CaCl_2$ foy;u feykr g bll ,Ydkgky vyx gk tkrk gA iFkDdkjh dhi }kjk bFkj dk iFkd dj yr g rFkk vukn $CaCl_2$ d mij l[kk yr gA 54°–36°C ij iu% vklou dju l 'k) bFkj ikIr gkrk gA

vFkok

'khj l ,Ydkgy cuku dh fof/k

1- **ok'k dk cuuk** %& xUu d jl l 'kDdj d fØLVy iFkd dj yu d i'pkr ihy xk< jx dk pkluh tlk no cprk g ftl 'khjk dgr g] 'khj e ty feykdj 8 l 10 ifr'kr ru djr g vkj ble FkkMh ek=k e vekfu;e lYQV vkj vekfu;e QkLQV rFkk lY¶;fjd vEy feyk fn;k tkrk g mDr foy;u e 5% ;hLV feyk fn;k tkrk gA feJ.k dk 2 l 4 fnu d fy, 25° l 30°C fMxh rki ij j[k nr gA dN le; i'pkr ;hLV e mifLFkr ,Utkbek dh mRijd fØ;kvk }kjk ,Fkuky cu tkrk gA

$C_{12}H_{22}O_{11} + H_2O \xrightarrow[\text{इन्वर्टेज}]{\text{ईस्ट एन्जाइम}} C_6H_{12}O_6 + C_6H_{12}O_6$

गन्ने की शक्कर — ग्लूकोज — फ्रक्टोज

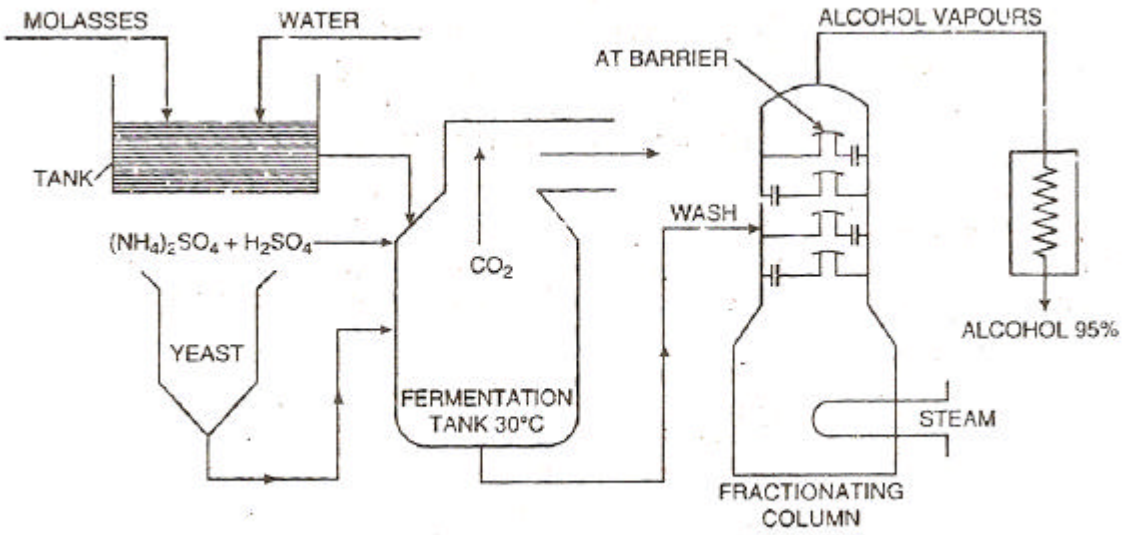
$C_6H_{12}O_6 \xrightarrow[\text{ईस्ट}]{\text{जाइमेज}} 2C_2H_5OH + 2CO_2$

ikIr foy;u dk ok'k dgr g ftle 6 l 10 ifr'kr C_2H_5OH rFkk 'k"k ty vkj vU; v'kf) gkrh gA

2- **ok'k dk vklou** %& ok'k dk vklou dkQ HkHkd e fd;k tkrk g ble nk LrEHk gkr g fo'y"kd rFkk ifj'kk/kd tk ,d nlj l tM gkr gA ok'k dk lfiykdkj

uyh }kjk ifj'kk/kd e l iokfgr djr g ikIr xe ok"i fo'y"kd d mijh fgLl l /khj&/khj fxjkr gA fo'y"kd e mij dh vk tk jgh Hkki uhp dh vkj vk jg ok'k d lEiØ e vkrh g rFkk mle l ,Ydkgky okf"ir djrh g ,Ydkgy dk DoFkukd 78-3 gA vr% ;g ok"i e vkx c<rk tkrk gA bu ok"i dk l?kfur dju l yxHkx 90 ifr'kr ,Ydkgky ikIr gkrk gA

fp=



Manufacture of ethyl alcohol from molasses

3- ifj'kk/ku& ok'k dk ifj'kk/ku iHkkth vklou l djr gA iHkkth vklou dju ij rhu iHkkt ikIr gkr gA

1- iFke iHkkt & ble ,lVfYMgkbM vkfn de DoFkukd d vin0; gkr gA

2- f}rh; iHkkt & ble 93&93-6 ifr'kr ,fFky ,Ydkgy gkrk g bld ifj'kk/ku l ifj'k) ,Ydkgy feyrk gA

3- vfre iHkkt & bl ¶; ty ry dgr g ble mPp DoFkukd oky vin0; gkr gA

i'u 12

mRrj & QkefYMgkbM l fuEu dk cukuk &

(1) ;jkVkfQu &

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

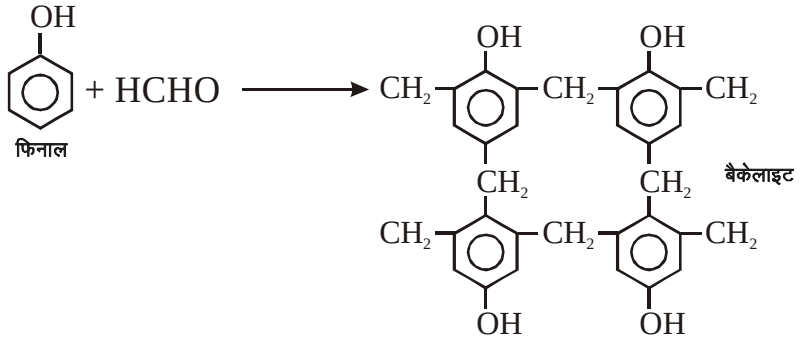
हेक्सामेथिलीन टेट्राअमीन (यूरोट्रापिन)

(2) ijk QkefYMgkbM &

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

पैरा फार्मेल्डिहाइड

(3) cdykbM &



(4) eFkuky &

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

पैरा फार्मेल्डिहाइड

vFkok

,lhfVd vEy l fuEu ikIr djuk

(1) ,lhfVd ,Ugkbdkbd cukuk & $[CH_3CO–O–COCH_3]$

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

(2) eFku cukuk & $[CH_3OH]$

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

(3) ,lhVku & $[CH_3COCH_3]$

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

(4) ,lhVekbM & $[CH_3CONH_2]$

$$CH_3COOH + NH_3 \longrightarrow \underset{\text{अमोनियम ऐसीटेट}}{CH_3COONH_4} \xrightarrow{\triangle} \underset{\text{ऐसेटामाइड}}{CH_3CONH_2} + H_2O$$

i'u 13

mRrj & (1) **ikVhu dh ikFkfed ljpuk** & iLrd l n[kdj tkudkjh ikIr dj

(2) **fo–frdj.k** & ikVhu dk fo–frdj.k e ikVhu m"ek rFkk jlk;uk l iHkkfor gkr gA ikVhu dk xe dju ij vFkok jklk;fud ;kfxdk l fØ;k djku ij bldh tfod fØ;k'khyrk u"V gk tkrh g vkj ; LdfUnr gkdj vfoy; gk tkr gA bl fØ;k dk ikVhu dk fo–frdj.k dgr gA fo–frdj.k l ikVhu dh ikFkfed ljpuk vifjofrr

jgrh g fdUr f}rh;d ,o rrh;d ljpuk e ifjoru gk tkrk g tl & tc v.M dk mcyr g, ikuh e dN nj d fy, j[kr g rk v.M dh ikVhu vfoy; j'knkj ikVhu e ifjofrr gk tkrh g ftll ikVhu LdfUnr gk tkrk g vFkkr ikVhu dk fodfrdj.k gk tkrk gA

vFkok

D.N.A. o R.N.A. e pkj fuEu fyf[kr vrj gA

	R.N.A.	D.N.A.
1-	bldh ,dygfyDl ljpuk gkrh g	bldh f}VfyDl ljpuk gkrh g ftle
2-	ftle jkbokt 'kdjk gkrh g	Mh&vkDlhjkbckt 'kdjk gkrh gA
3-	bld ik;jhfeMhu {kkj e ;jfly gkrk gA	ble ik;jhfeMhu {kkj e Fkk;ehu gkrk gA
4-	;g lkbVkIykTe o Økeklke e ik;k tkrk g ftldk e[; dk; ikVhu fuek.k gA ;g ln'k okgd dk dk; djrk gA	;g ukfHkd e ik;k tkrk g ftldk e[; dk; ird x.kk d okgd d :i e dk; djrk gA iR;d D.N.A. ,d ;k ,d l vf/kd ,Utkbe d dk; dk fun'k djrk gA

i'u 14

mRrj & ikphu Hkkjrh; oKkfud

(1) **pjd** & fpfdRlk 'kkL= d {k= e egku dk;k d fy, pjd dk fpfdRlk 'kkL= dk firk dgk tkrk gA

vk;on e vkpk; pjd dk ;kxnku egRoi.k g D;kfd bUgku ekuo ljpuk ,o jDr lpkj d ckj e egRoi.k tkudkjh miyC/k djokb gA bld vfrfjDr e/keg] {k;jkx ,o ân; lc/kh chekjh d mipkj Hkh crk; gA

bud }kjk jfpr pjd lfgrk dk vk;on dk fo'o dk'k ekuk tkrk gA

pjd u bl pjd lfgrk e 1 yk[k tMh&cfV;k dh x.koRrk ,o mldh dk; i.kkyh dk crk;k g mUgku ekuk g fd /kkfed lkp o LokLF; dk lc/k gkrk gA mUgku dgk g fd 'kjhj efLr"d ij Hkktu o nfud fØ;kDykik dk iHkko gkrk gA ftll jkxk dk vklkuh l igpku dj funku fd;k tk ldrk gA

(2) **vkpk;d.kkn** & vkpk; d.kkn dk ijek.k fl)kUr dk tud ekuk tkrk gA o o'kf"kd n'ku d iord eku tkr gA o'kf"kd n'ku dk ey vk/kkj ijek.kokn gA mud vulkj lHkh oLr, uk rRok l feydj cuh gkrh g iFoh] ikuh] gok] vkRek] efLr"d] idk'k] ekle] le; txg gA

vkpk;d.kkn u MkYVu d fl)kr d gtkjk o"k io crk;k fd cgek.M d iR;d

d.k dk fuek.k ijek.k }kjk gvk gA mUgku v.kvk dh xfr] foekvk vkj jklk;fud fØ;kvk d ckj e Hkh crk;k gA ¼bld vfrfjDr vU; oKkfud tl & vkpk; lJr] vkpk; ukxktu] ck.k HkVV vkfn oKkfudk dk crk;k tk ldrk gA½

vFkok

i'u 15

mRrj & (a) DoFkukd e mUu;u & fdlh no dk DoFkukd og rki g ftl ij mld ok"i nkc dk eku ok; e.Myh; nkc d cjkcj gkrk tkrk g vr% ge tkur g fd fdlh foy;u dk ok"i nkc 'k) foyk;d d ok"inkc l de gkrk gA vr% og rki ij ftl ij fdlh foy;u dk ok"i nkc ok;e.Myh; nkc d cjkcj gk tkrk gA ¼vFkkr foy;u dk DoFkukd½ ml rki l vf/kd gkxk ftl ij 'k) foyk;d dk ok"i nkc ok;e.Myh; nkc d cjkcj gk tkrk g ¼vFkkr 'k) foyk;d dk DoFkukd½ ;kfu 'k) foyk;d e dkb foy; feyku ij mld DoFkukd e gku okyh of) DoFkukd dk mYy?ku dgykrh gA bl $\triangle Tb$ l inf'kr djr g vr% $\triangle Tb = Tb — Tb°$

fgekd voueu $\triangle Tf = 0 – (–0186) = 0.186°C$

fgekd voueu fLFkjkd $Kf = 1.86\ K\ Kg\ mol^{-1}$

DoFkukd mUu;u fLFkjkd $Kb = 0.512\ K\ Kg\ mol^{-1}$

$$\triangle Tf = Kf \text{ x ekyyrk}$$

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

$$\triangle Tb = Kf \text{ x ekyyrk}$$

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

$$\triangle Tf = 0.512°C$$

DokFkukd dk mUu;u = 0.512°C

vFkok

ijklj.k nkc & v) ikjxE; f>Yyh }kjk foyk;d v.kvk d foy;u dh vkj gku oky iokg dk jkdu d fy; foy;u ij yxk;k x;k nkc ijklj.k nkc dgykrk gA

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

i'u d vuqkj v = 1 yhVj] T = 300 k, R=0.0821 yhVj ok;e.Myh;] WB = foy; dk n0;eku] MB = foy; dk vf.od n0;eku fMxh^{-1} eky^{-1}

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

ijklj.k nkc = 2.46 ok;e.My

i'u 16

mRrj & vfHkfØ;k d vfHkdkjdk vFkok fØ;kQyk dh lkUnrkvk e le; d lkFk tk ifjoru gkrk g ml vfHkfØ;k nj dgr gA

$$\text{vfHkfØ;k nj} = \frac{\text{fØ;kdkjd rFkk fØ;kQy dh lkUnrk e ifjoru}}{\text{le; vUrjky}}$$

bdkb & eky fyVj^{-1} ld.M^{-1}

vfHkfØ;k dh nj dk iHkkfor dju oky dkjd &

1- vfHkdkjd dk lkUn.k& vfHkdkjd dk lkUn.k c<ku ij vfHkfØ;k dh nj c< tkrh g D;kfd vfHkfØ;k dh nj vfHkdkjd d lfØ; n0;eku d lekuikrh gA lkUn.k c<ku ij vfHkdkjd v.kvk dh l[;k c< tkrh g ft ll iHkkoh VDDjk dh l[;k e of) gk tkrh gA

2- vfHkfØ;k dk rki& lkekU; vfHkfØ;kvk e rki c<ku l vfHkfØ;k dh nj e of) gk tkrh g] D;kfd rki c<ku l v.kvk dh xfrt Åtk dk eku c< tkrk gA i;kxk }kjk n[kk x;k g fd ifr 10 rki of) l vfHkfØ;k dh nj nk l rhu xuh rd gk tkrh gA

3- mRijd dh mifLFkfr& mRijd dh mifLFkfr l lfØ; Åtk dk eku ifjofrr gk tkrk gA ft ll vfHkfØ;k dh nj ifjofrr gk tkrk g ft ll vfHkfØ;k dh nj ifjofrr gk tkrh gA /kukRed mRijd vfHkfØ;k dh nj dk c<k nr g tcfd _.kRed mRijd vfHkfØ;k nj e of) gk tkrh gA

4- nkc& xlh; vfHkfØ;kvk e nkc c<ku l vfHkfØ;k dh nj c< tkrh gA nkc c<ku l vfHkdkjd v.k ikl&ikl vk tkr g iHkkoh VDDjk dh l[;k c< tkrh gA ft ll vfHkfØ;k nj e of) gk tkrh gA

¼bld vykok i"B {k=Qy Hkh fy[kk tk ldrk g ½

vFkok

ngyh Åtk & lfØ;r v.k d ikl tk lEi.k Åtk gkrh g ml ngyh Åtk dgr gA ngyh Åtk ;Dr v.k rjUr gh mRikn ldy vkj fQj vi?kfVr gkdj mRikn v.k e cny tkrk gA

ngyh Åtk = v.k dh fuEure Åtk + lfØ;.k Åtk

lfØ;.k Åtk & og Åtk tk v.k dk lfØ; dju d fy, vko';d gkrh g lfØ;.k Åtk ikIr v.k Åtk vojk/k dk ij dj mRikn ldy cukrk gA

lfØ;.k Åtk = ngyh Åtk & v.k dh fuEure Åtk

lfØ;.k Åtk vkj ngyh Åtk e lc/k & lfØ;.k Åtk vkj ngyh Åtk e ijLij fudV dk lc/k gkrk g v.k Åtk xg.k dj lfØ;.k Åtk ikIr dj yrk g tk 'kh?k gh ngyh Åtk e cny tkrh gA ngyh Åtk ;Dr v.k mRikn e cny tkrk gA vr%

lfØ;.k Åtk = ngyh Åtk & v.k dh fuEure Åtk

ngyh Åtk = lfØ;.k Åtk + v.k dh fuEure Åtk

i'u &17

mRrj & **yUFkukbM ldpu** & yUiukbMk d ijek.k Øekd d c<u d lkFk lkFk mud ijek.kvk ,o vk;uk d vkdkj e deh gkrh g bl yUFkukbM ldpu dgr gA

dkj.k & yUFkukbMk e vku okyk byDVku 0kL;re d{k e u tkdj midk'k e io'k djrk g Qyr% byDVku vkj ukfHkd d e/; vkdk.k cy e of) gkrh g ftll ijek.k rFkk vk;u ldfpr gk tkrk gA

yUFkukbM ldpu d iHkko & yUFkukbM ldpu fuEu fyf[kr dkjdk dk iHkkfor djrk gA

1- vk;u dk vkdkj % yUFkukbMk d vk;uk dk vkdkj Øe'k% de gk tkrk gA

2- fo|r _.kkRedrk % Ce(58) l Lu(71) rd fo|r _.kkRedrk Øe'k% vf/kd gkrh gA

3- vip;u foHko +3 vkDlhdj.k voLFkk d fy, vip;u foHko Øe'k% –2.48v l –2.25v rd Ce(58) l Lu(71) rd vf/kd gkrk tkrk gA

vFkok

lØe.k rRok (3D) d x.k &

1- **mRijdh; x.k** & fofHkUu jklk;fud vfHkfØ;kvk e i;Dr gku oky mRijd ik;% lØe.k J.kh oky rRo vkj mud ;kfxd gkr gA

lØe.k dh mRij.k fØ;k'khyrk d fuEu dkj.k gA

v- ek/;fed ;kfxd dk fuek.k& lØe.k rRo ifjorh l;ktdrk d dkj.k vLFkk;h ek/;fed ;kfxd cuk yrk g vkj bl ikj ,d fuEurj lfØ;.k Åtk okyk uohu iFk vfHkfØ;k d fy, miyC/k djokr gA

c- i"B {k=& lØe.k rRok dk i"B {k=Qy vf/kd gkrk g blfy, l;ktdrk, Lor= vf/kd gk tkrh gA vr% ; rRo viuh lrg ij vfHkdkjdk dk vf/k'kkf"kr dj yr gA ftll i"B {k=Qy ij vfHkdkjdk dk lkUn.k c< tkrk g QyLo:i fØ;kRed ox e of) gk tkrh gA

2- **jxhu vk;u** & lØe.k rRok d (n–1) miØk'k vkf'kd Hkj gkr g bue mifLFkr vk;fer byDVku n'; idk'k dh Åtk dk vo'kkf"kr djd mPp Åtk okyh fjDr vkfoVy e py tkr gA lØe.k gk tkrk g QyLo:i ijkofrr idk'k lQn u gkdj jxhu gkrk g blfy, lØe.k rRok d ;kfxd vFkok vk;u jxhu gkr g mnkgj.k %

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

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

byDVkfud foU;kl l Li"V g fd Cu^{+} ¼D;il½ vk;u e lHkh byDVku ;fXer g blfy, n'; idk'k dh Åtk dk vi'kkf"kr djd bld byDVku mRrftr ugh gkr g vFkkr lØe.k ugh gkrk gA QyLo:i ijkofrr idk'k lQn gkrk gA blfy, Cu^{++} jxghu gkrk gA tcfd Cu^{++} vk;u l ,d byDVku vk;fXer gkrk g ;g n'; idk'k dh Åtk dk vo'kkf"kr djd mPp Åtk Lrj e dn tkrk gA C^{++} lØe.k gk tkrk gA QyLo:ii ifjofrr idk'k lQn u gkdj jxhu gkrk gA blfy, Cu^{++} vk;u jxhu gkrk gA