General Organic Chemistry

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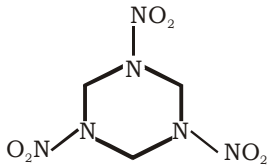
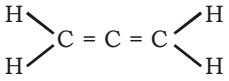
Father of Chemistry - Antoine Lavoisier.
Father of Organic Chemistry - Friedrich Wohler
Father of Physical Chemistry - Wilhem Ostwald
Father of Inorganic Chemistry - Alfred Werner
Father of Indian Chemistry - P.C.Ray
Laughing gas - N_2O nitrous oxide
Lighting gas - NO nitric oxide
Tear gas - CCl_3NO_2
Norbia - This is hardest substance (artificial) B_4C
Inorganic Graphite - $(BN)_x$ (Boron nitride)
RDX - Research Development Explosive discovered by Hens Henning and this is prepared by the reaction of urotropin with conc. HNO_3

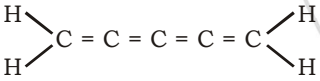


(RDX)

Allene - Allene has three carbons and all are ene



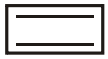
Cumulene - More than three carbon and all are ene



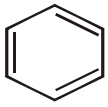
$\equiv(C)_n$ n = 99 then 101 carbon

Annulene- Annulene is mono cyclic compound with alternate double bond.

Annulene [4] -

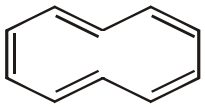


Annulene [6] -



Annulene [8] -

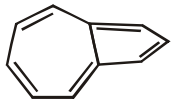
Annulene [10] -



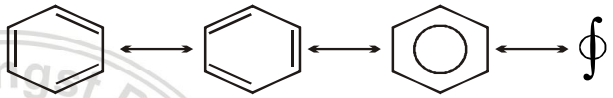
Annulene [12] -

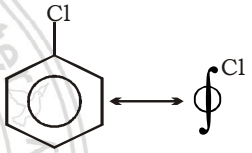
Annulene [16] -

Azulene -

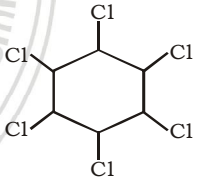


Benzene - Discovered by Faraday

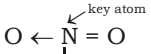




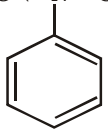
BHC - Benzene hexachloride/gamaxene/lindane/666



Key atom - Atom which is directly attached with benzene ring is called key atom. Hydrogen never be key atom.



1)



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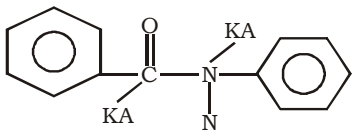

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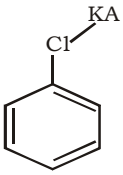
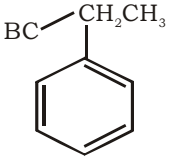


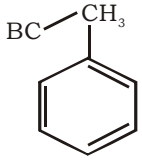
Carbinol:- Methyl alcohol is called carbinol.

- CH_3 - OH → carbinol
- CH_3 - CH_2OH → methyl carbinol
- CH_3 - CH_2 - CH_2OH → ethyl carbinol
- $CH_3—\underset{\displaystyle CH_3}{\underset{|}{CH}}—CH_2OH$ → Isopropyl carbinol

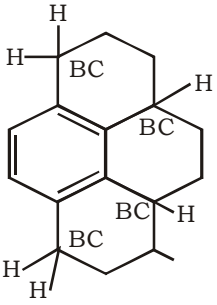
Benzyl carbon - Carbon which is directly attached with benzene ring is called benzyl carbon.



BH = 2
BC - 1



BH = 3
BC - 1



BC = 4
BH - 6

IUPAC Nomenclature of elements atomic number greater than 100-

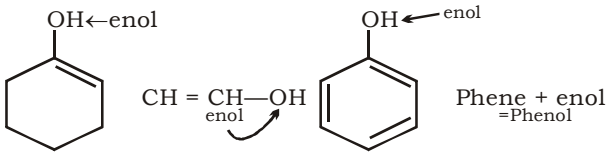
Till the date total 118 elements have been discoverd

0 → nil	5 → Pent
1 → Un/uni	6 → hex
2 → Bi	7 → Sept
3 → tri	8 → oct
4 → quad	9 → enn

Eg.)

1) 104 → un + nil + quad + ium symbol : Unq
2) 107 → un + nil + sept + ium symbol: Uns
3) 111 → un + un + un + ium = symbol : Uuu
4) 118 → Un + Un + oct + ium = symbol : Uuo

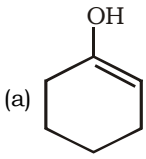
Enol: Such type of OH which is directly attached with double bonded carbon is called enol.

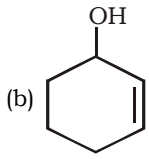


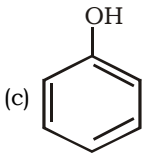
All enol gives blood red colour with neutral $FeCl_3$.

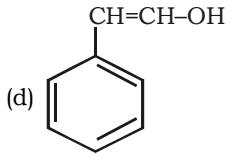
Problem:

Which of the following will give red colour with anhydrous $FeCl_3$:



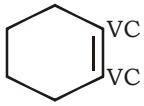






Ans.: a, c, d

Vinyl Carbon- Double bonded carbon is called vinyl carbon.



$CH_3—\underset{VC}{CH} = \underset{VC}{CH}—CH_3$ $\quad CH_2 = \underset{VC}{CH_2}$

$CH_2 = CH-$ Vinyl Group

$CH_2 = CH—Cl$ (vinyl chloride) $\quad CH_2 = CH—CN$ (vinyl cyanide) $\quad CH_2 = CH—C\equiv C—H$ (vinyl acetylene)

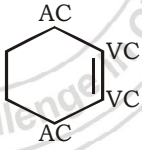
Vinyl ester is called acroylate or acrylate

$CH_2 = CH—\overset{\displaystyle O}{\overset{\|}{C}}—O—CH_3$ — Methyl acrylate

$CH_2 = CH—\overset{\displaystyle O}{\overset{\|}{C}}—O—C_2H_5$ — Ethyl acrylate

$CH_2 = \underset{\displaystyle CH_3}{\underset{|}{C}}—\overset{\displaystyle O}{\overset{\|}{C}}—O—CH_3$ Methyl Metha acrylate

Allyl carbon - Single bonded carbon in adjacent of double bonded carbon is called Allyl carbon.



AH = 4

$CH_3—CH = CH—CH_3$
AC VC VC AC
AH = 6

$CH_3—CH = CH_2$
AC VC VC

$—CH_2—CH = CH_2$
Allyl group

$CH_2 = CH-CH_2Cl$ (Allyl Chloride) $\quad CH_2 = CH-CH_2-CN$ (Allyl Cyanide)

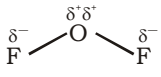
$CH_2 = CH—CH_2—C\equiv C—H$
Allylacetylene

Electronegativity

Capacity to attract the bonded pair of e^- towards itself is called electronegativity, represented by *x*. This is a relative term and has no unit.

On Pauling scale value of electronegativity is defined as:

F = 4.0	S = 2.5	K = 0.8
O = 3.5	I = 2.5	Cs = 0.7
Cl = 3.2	H = 2.1	Br = 2.8
N = 2.9	Li = 1.0	
C = 2.5	Na = 0.9	

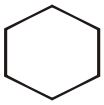


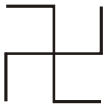
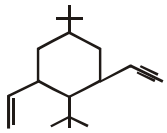
$H-C\equiv N \rightarrow H^+ + C^-\equiv N$

$H_2N-Cl \rightarrow H_2N^+ + Cl^-$

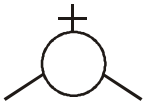
$HO-Cl \rightarrow HO^- + Cl^+$

1. Write the skeleton diagram of following:

(i)  (ii) 

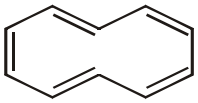
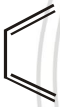
(iii)  (iv) 

(v) 

(vi)  (vii) 

(viii)  (ix) 

(x)  (xi) 

(xii)  (xiii) 

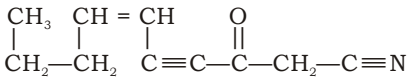
(xiv) (xv)

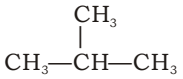
2. Represent the following in line diagram:

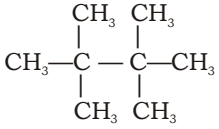
(i) $CH_3CH_2CH_2CH_2CH_2CH_3$

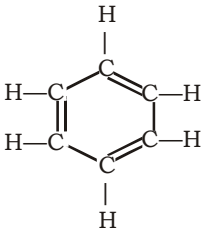
(ii) $CH_2 = CH - CH = CH_2$

(iii) $CH \equiv C - CH = CH_2$

(iv) 

(v) 

(vi) 

(vii) 

(viii) $CH_3-CH_2-CH_2-\overset{O}{\overset{\|}{C}}-OH$

(ix) $CH_3CH_2-C\equiv C-CH_2-\overset{O}{\overset{\|}{C}}-H$

(x) $CH_3-\overset{O}{\overset{\|}{C}}-CH_2-CH_2-\overset{O}{\overset{\|}{C}}-OH$

3. Describe the following:

(i) Vinyl Carbon
(ii) Allyl Carbon
(iii) Benzyl Carbon
(iv) α – Carbon
(v) 1^0, 2^0, 3^0, 4^0 Carbon
(vi) 1^0, 2^0, 3^0 Hydrogen
(vii) Key atom
(viii) Allene
(ix) Cumulene
(x) Annulene [8]
(xi) Annulene [10]
(xii) Annulene [12]
(xiii] Annulene [14]
(xiv) Annulene [16]
(xv) RDX
(xvi) BHC/666/Gamaxene/ Lindane
(xvii) Laughing Gas
(xviii) Lighting gas
(xix) Tear gas
(xx) Azulene

4. Identify functional group:

(i) $-\overset{O}{\overset{\|}{C}}-OH$ ..... (ii) $-\overset{O}{\overset{\|}{\underset{O}{\underset{\|}{S}}}}-OH$ ($-SO_3H$) .....

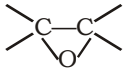
(iii) $-\overset{O}{\overset{\|}{C}}-H$ ..... (iv) $-\overset{O}{\overset{\|}{C}}-$ .....

(v) $-NH_2$ ..... (vi) $-\overset{O}{\overset{\|}{C}}-Cl$ .....

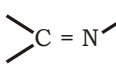
(vii) $-\overset{O}{\overset{\|}{C}}-NH_2$ ..... (viii) $-\overset{O}{\overset{\|}{C}}-O-R$ .....

(ix) $-\overset{O}{\overset{\|}{C}}(-O-\overset{}{C}=O)$ ..... (x) $-OH$ .....

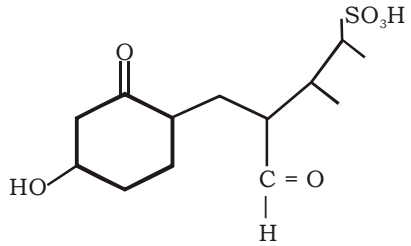
(xi) $-X$ ..... (xii) $-NO_2$ .....

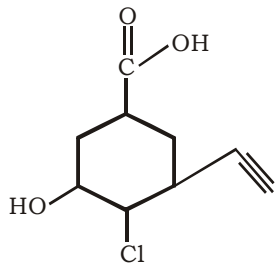
(xiii) $-C \equiv N$ ..... (xiv)  .....

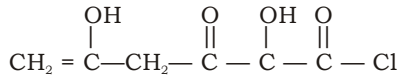
(xv) $-OR$ ..... (xvi) $=\overset{OH}{\overset{|}{C}}-$ .....

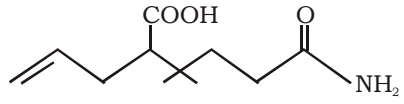
(xvii) $-CH = NH$ ..... (xviii)  .....

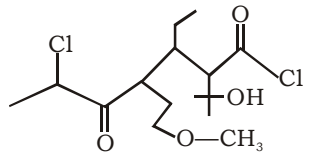
5. Identify the functional groups in given following:

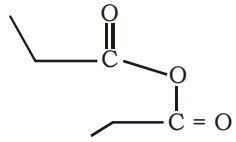
(i) 

(ii) 

(iii) 

(iv) 

(v) 

(vi) 

6. Describe the following terms:
   (i) Enol (ii) Imine
   (iii) Enamine (iv) Normal chain
   (v) Iso Group (vi) Neo group
   (vii) Selectivity (viii) Pyrene
   (ix) Ortho, meta and para position
   (x) Napthalene (xi) Anthracene
   (xii) Pyridiene (xiii) Carbolic Acid
7. Write the structure of following:
   (i) n-hexane (ii) iso-butane
   (iii) Acetic acid (iv) β – napthol
   (v) Benzyl chloride (vi) Benzyl alcohol
   (vii) Benzoic acid (viii) Cresol
   (ix) Phenol (x) Tolune
   (xi) Salicylic acid (xii) Catechol
   (xiii) Resorcinol (xiv) Quinol
   (xv) Pyrogallol (xvi) Phloroglucinol
   (xvii) Salicylic acid (xviii) Furan
   (xix) Pyran (xx) Pyrrole
   (xxi) Piperidine (xxii) Thiophene
   (xxiii) Thiopyran (xxiv) Imidazole
   (xxv) Oxazole (xxvi) Pyrazole
   (xxvii) Thiazole (xxviii) Tetrahydro furan
   (xxix) Purine (xxx) Pyrazine
8. Write the structure of following:
   (i) Aniline (ii) Benzophenone
   (iii) Acetophenone (iv) Benzaldehyde
   (v) Phenanthrene (vi) Formic acid
   (vii) Acetone (viii) Allene
   (ix) Ethyl Alcohol (x) Ethyl Carbinol
   (xi) Neo pentane (xii) But-2-ene
   (xiii) but-2-yne (xiv) 2-butanol
   (xv) Ethyl amine (xvi) Methyl isocyanate
   (xvii) Ethyl cyanide (xviii) Methyl isocyanide
   (xix) Nitro-propane (xx) Ethyl Chloride
   (xxi) Syn-gas (xxii) Diethyl ether
   (xxiii) Propanoic acid (xxiv) Acetaldehyde
   (xxv) Dimethyl ketone (xxvi) Acetic anhydride
   (xxvii) Nitrobenzene (xxviii) Chlorobenzene
   (xxix) Anisole (xxx) Aspirine
9. Define the following:
   (i) Baking Soda (ii) Sulphuric Acid
   (iii) Common Salt (iv) Common Sugar
   (v) Green House Gases (vi) CFC's
   (vii) Refrigerant (viii) Dry-Ice
   (ix) Green Chemistry (x) Reaction
   (xi) Quick Lime (xii) Lime Stone
   (xiii) Slaked Lime (xiv) Washing Soda
   (xvi) Plaster of Paris (xvi) Gypsum
   (xvii) Ozone (xviii) Diamond
   (xix) Graphite
   (xx) Buck minister Fullerene
   (xxi) Carnallite (xxii) Corundum
   (xxiii) Galena (xxiv) Corrosive sublimate
   (xxv) Chile Saltpeter (xxvi) Indian Saltpeter
   (xxvii) Ethylene (xxviii) Marsh Gas
   (xxix) Natural Gas (xxx) LPG
10. Write the use of following:
   (i) DDT (ii) BHC
   (iii) Aldrine (iv) $NaClO_3$
   (v) Dettol (vi) Paracetamol
   (vii) Aspirin (viii) Cetrizin
   (ix) CCl_3NO_2 (x) NH_3
   (xi) Aqua regia (xii) HCl
   (xiii) H_2SO_4 (xiv) HNO_3
   (xv) CaO (xvi) Cl_2
11. Write the name of following:
   (i) $SOCl_2$ (ii) PCl_5
   (iii) $NaNO_3$ (iv) N_2O_5
   (v) NO_2 (vi) NO
   (vii) H_2SO_4 (viii) $Ca(OH)_2$
   (ix) Na_2CO_3 (x) $Ca_3(PO_4)_2$
   (xi) $Cu(OH)_2$ (xii) $CuSO_4$
   (xiii) NaOH (xiv) KOH
   (xv) KCl (xvi) PCl_3
   (xvii) $CaSO_4\frac{1}{2}H_2O$ (xviii) $Al(OH)_3$
   (xix) H_2O_2 (xx) SO_2
   (xxi) SO_3 (xxii) N_2O
   (xxiii) Na_3PO_4 (xxiv) $3HCl + HNO_3$
   (xxv) NaOH + CaO (xxvi) BaO_2
   (xxvii) Na_2CO_3 (xxviii) $MgCl_2$
   (xxix) $KHCO_3$ (xxx) Li_2O
12. Define the following term:
   (i) α – carbon (ii) β – carbon
   (iii) γ – carbon (iv) Nascent Hydrogen
   (v) Nascent Oxygen (vi) Vic and Gem Chlorides
   (vii) Reduction (viii) Oxidation
   (ix) Redox Reaction (x) Decomposition Reaction

BEST OF LUCK