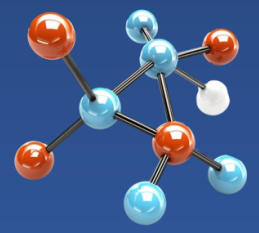
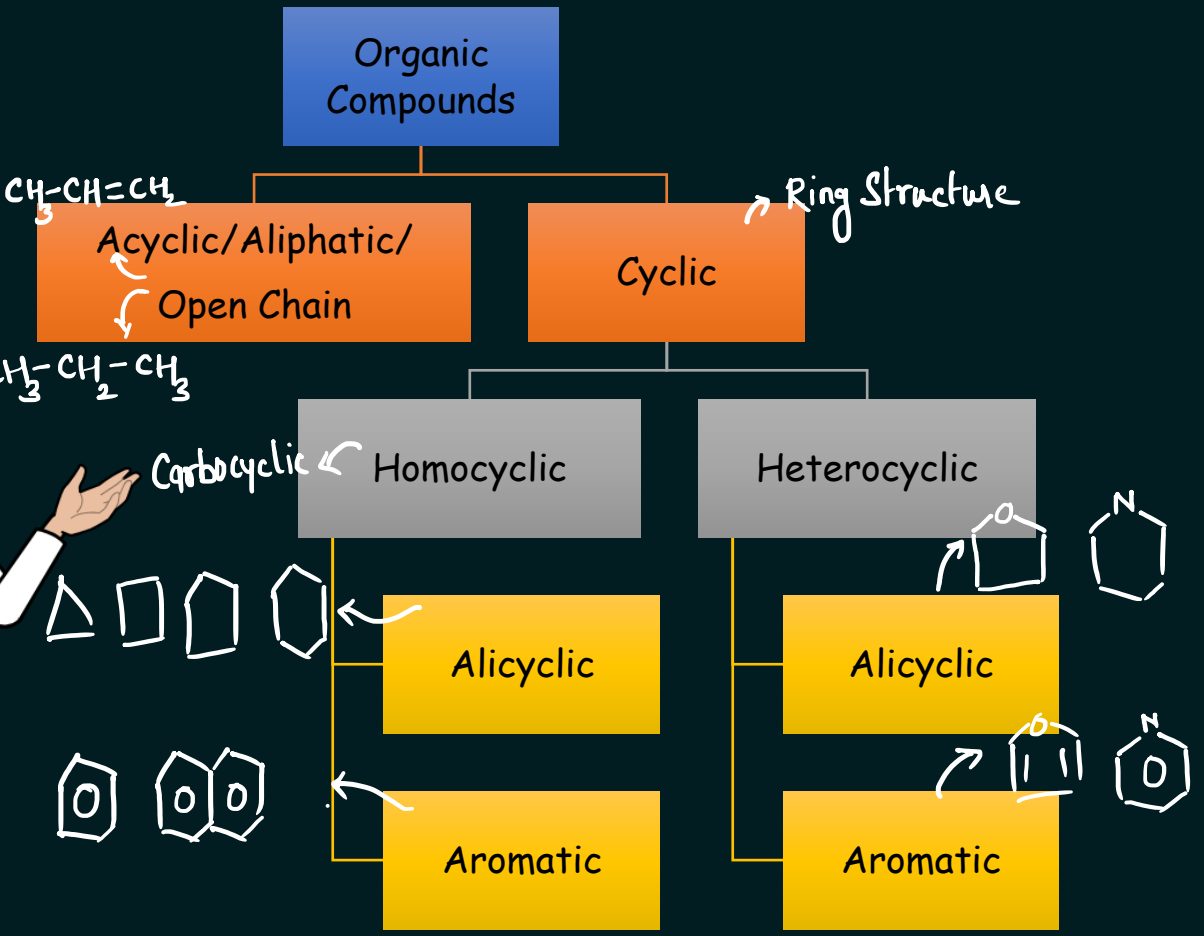
#2

Introduction & Classification of Organic Compounds





B.Pharm. | POC-I | U 1 | L1

Organic Chemistry

Compounds

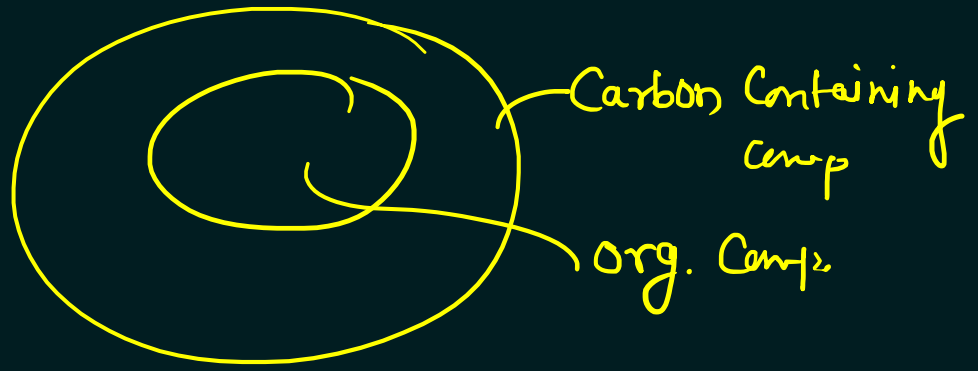
Inorganic

Source

Minerals

Organic → Carbon

Living material (plant, animal, human)



1828 KOCN + NH_4Cl → KCl + NH_4OCN

KOCN: pot. cyanate → Inorg

NH_4OCN: In-org, Amm. Cyanate

Heat

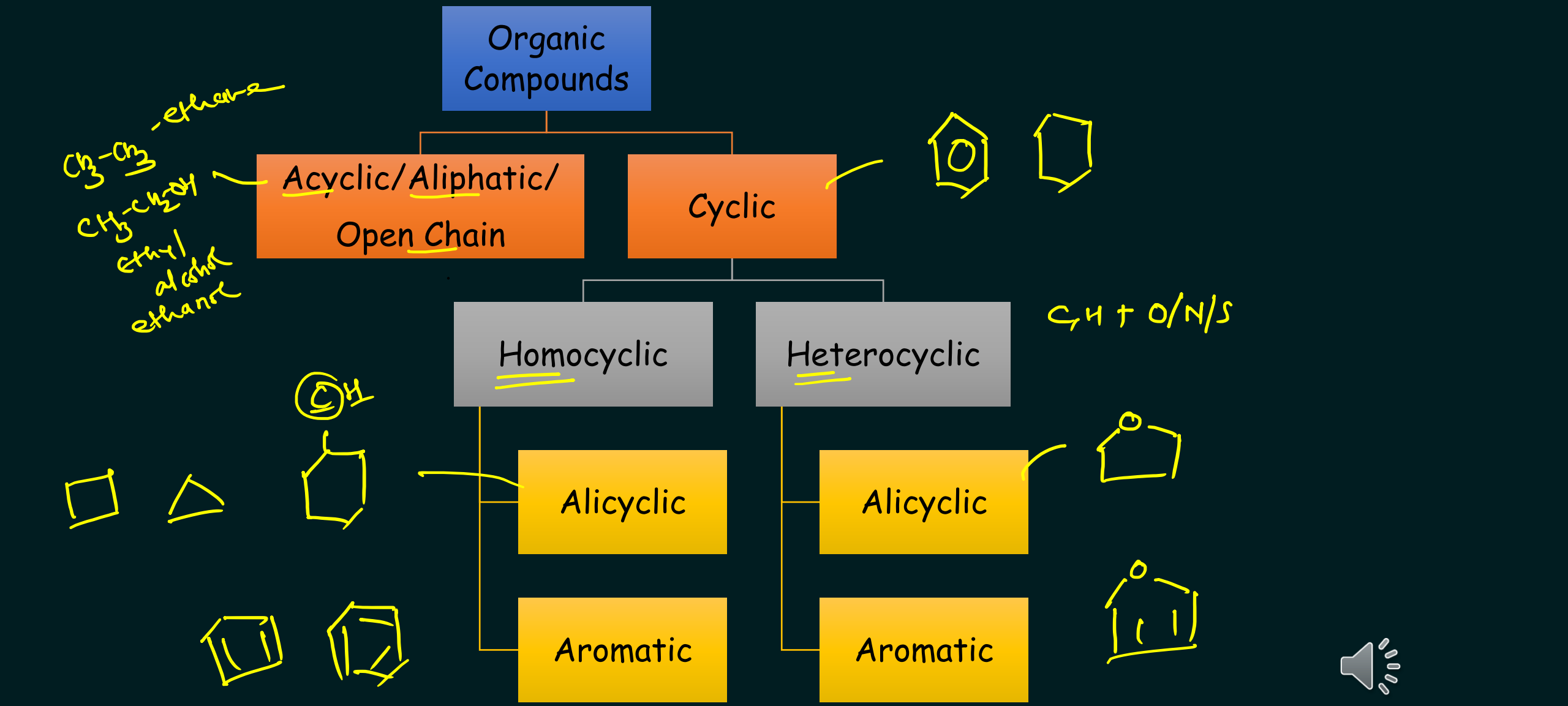
Urea → $NH_2-\overset{\overset{O}{\|}}{C}-NH_2$ → Org. Comp.

Inorg :→ CO_2, CO, KCN, Na_2CO_3, $NaHCO_3$, KOCN, NH_4OCN

Organic Chemistry

- Chemistry of ~~Carbon containing~~ org. compounds. org. comp ⟶ C, H, O, N P, S
- Organic chemistry is the study of the structure, properties, composition, reactions, and preparation of ~~carbon containing~~ org. compounds.
- Most organic compounds contain carbon and hydrogen, but they may also include any number of other elements (e.g., nitrogen, oxygen, halogens, phosphorus, silicon, sulfur).
- Before 1850s chemist belief that inorganic compounds are obtained from minerals, and organic compounds are obtained from living organism (plants/animals).
- But today, we know that many organic compound can synthesize form inorganic materials like carbonates or cyanides.

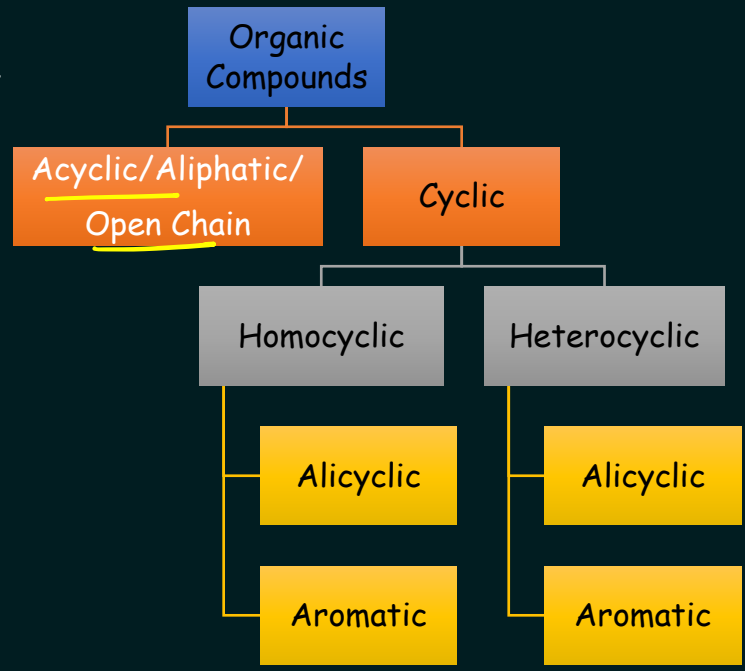
Classification of Organic Compounds



Classification of Organic Compounds

A. Acyclic/Aliphatic/Open Chain

- Organic compounds in which all the carbon atoms are linked to one another to form open chains (straight or branched) are called acyclic or open chain compounds. These may be either saturated or unsaturated. For example- Alkanes, Alkenes, Alkynes

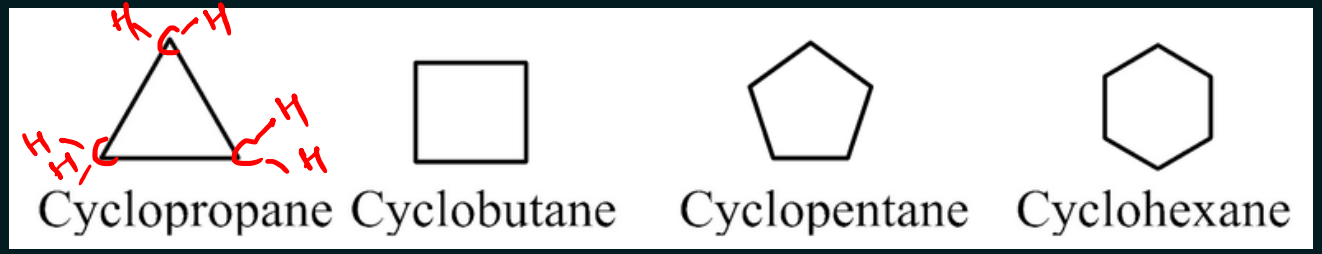


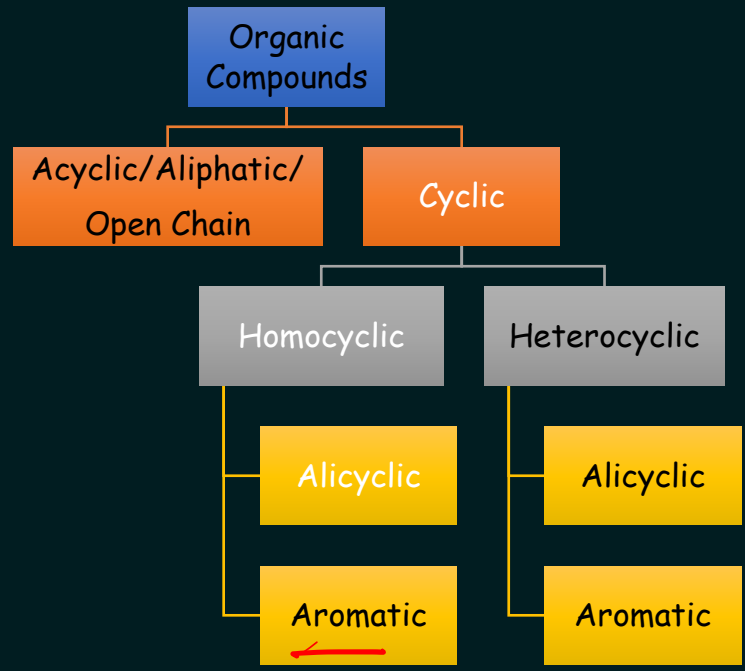
- Butane→ $CH_3CH_2CH_2CH3$
- Isobutane→ $(CH_3)_2CHCH_3$
- 1-Butene → $CH_3CH_2CH = CH_2$
- 3,3-dimethyl-1-butene → $(CH_3)_3C - C \equiv CH$
- Ethyl alcohol→ CH_3CH_2OH
- Acetic Acid→ CH_3COOH
- Acetaldehyde → CH_3CHO

Classification of Organic Compounds

B. Cyclic

- Cyclic compounds contain at least one ring or closed chain of atoms. These are of two types:
- 1. Homocyclic: These compounds contain rings which are made up of only one kind of atoms. If all the atoms in the ring are carbon atoms, they are called carbocyclic compounds. These are of two types-
  - i) Alicyclic: Alicyclic compounds are carbocyclic compounds which resemble aliphatic compounds in their properties. For example

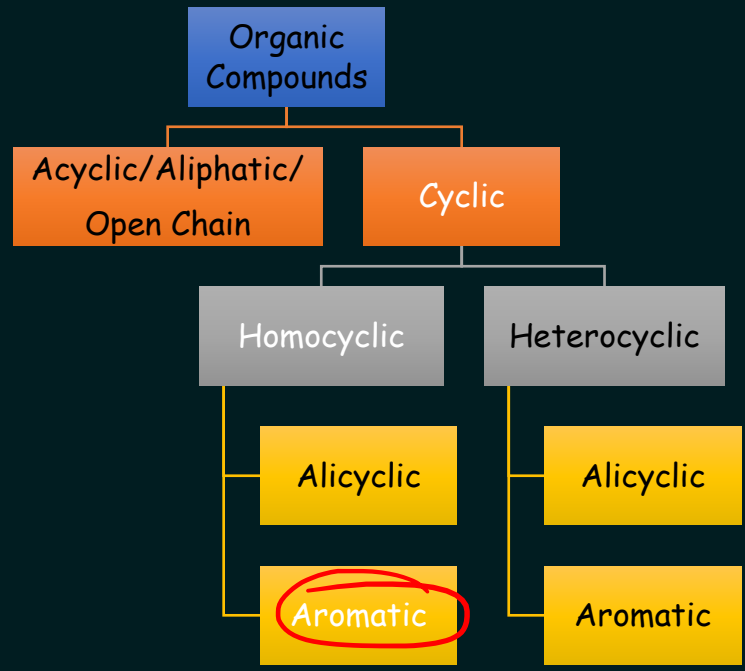


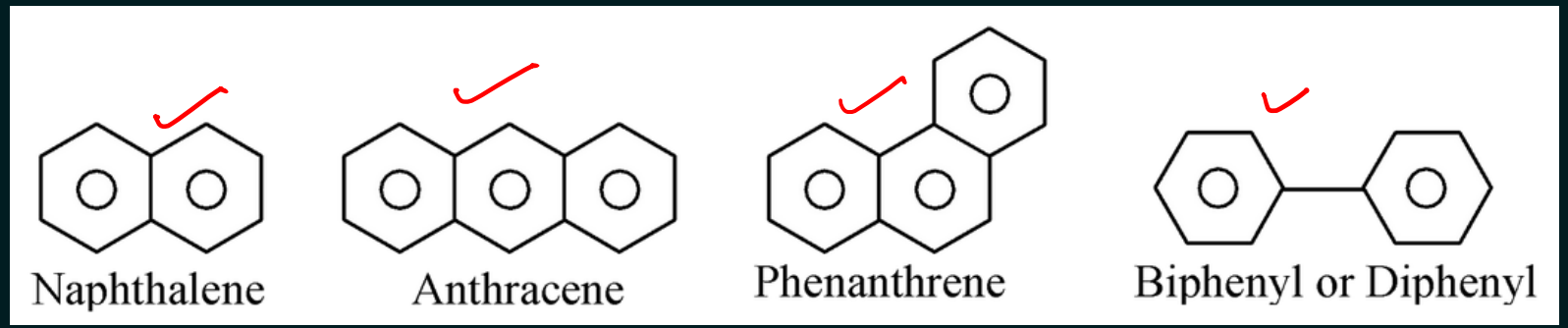


Classification of Organic Compounds

B. Cyclic

- Cyclic compounds contain at least one ring or closed chain of atoms. These are of two types:
- 1. Homocyclic:
  - ii) Aromatic: Organic compounds containing one or more fused or isolated benzene rings are called aromatic compounds, These are also called benzenoid compounds or arenas.

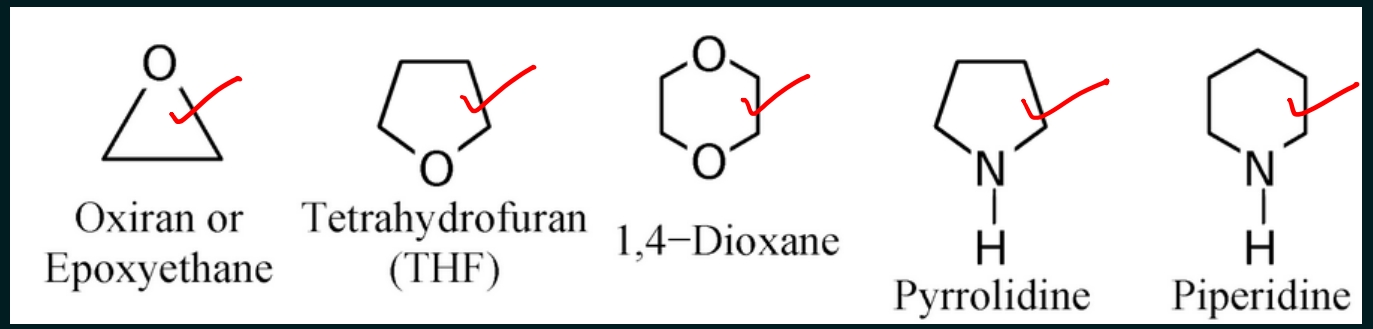


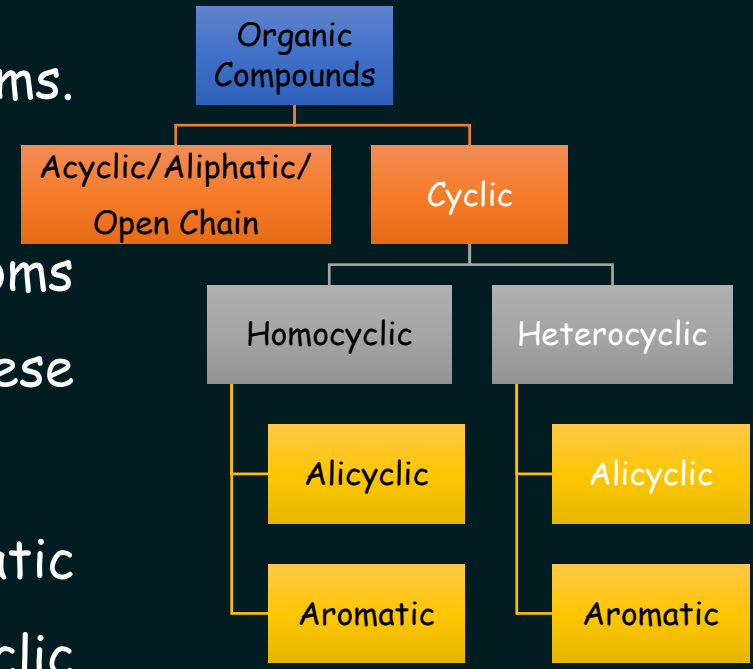


Classification of Organic Compounds

B. Cyclic

- Cyclic compounds contain at least one ring or closed chain of atoms. These are of two types:
- 1. Heterocyclic: Cyclic compounds containing one or more heteroatoms (e.g. O, N, S etc.) in the ring are called heterocyclic compounds. These are of two types. (C+H) + N/O/P/S — Heteroatoms
  - i) Alicyclic: Heterocyclic compounds which resemble aliphatic compounds in their properties are called alicyclic heterocyclic compounds. For example,

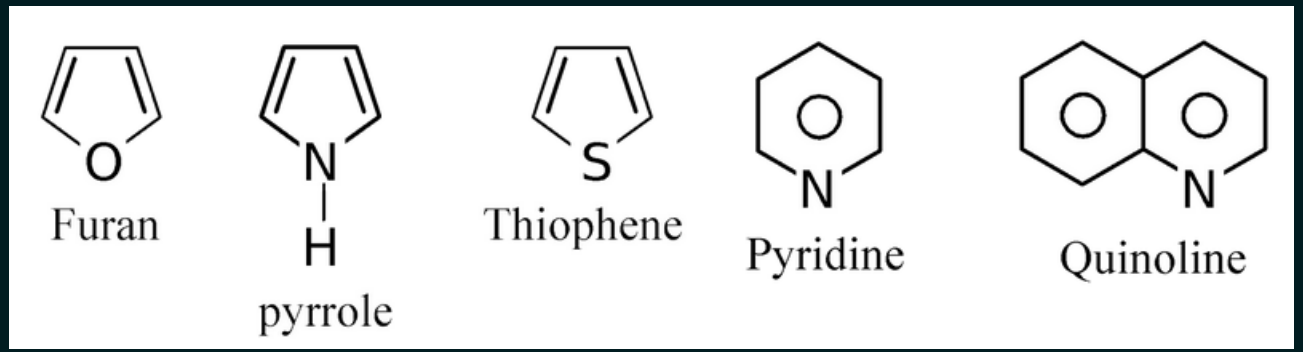


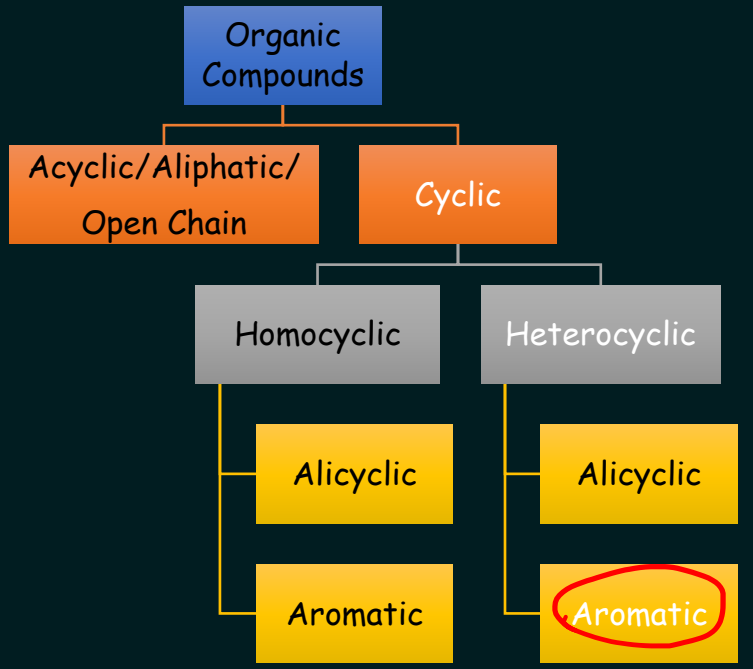


Classification of Organic Compounds

B. Cyclic

- Cyclic compounds contain at least one ring or closed chain of atoms. These are of two types:
- 1. Heterocyclic:
  - ii) Aromatic: Heterocyclic compounds which resemble benzene and other aromatic compounds in most of their properties are called aromatic heterocyclic compounds. For example.





#3

IUPAC

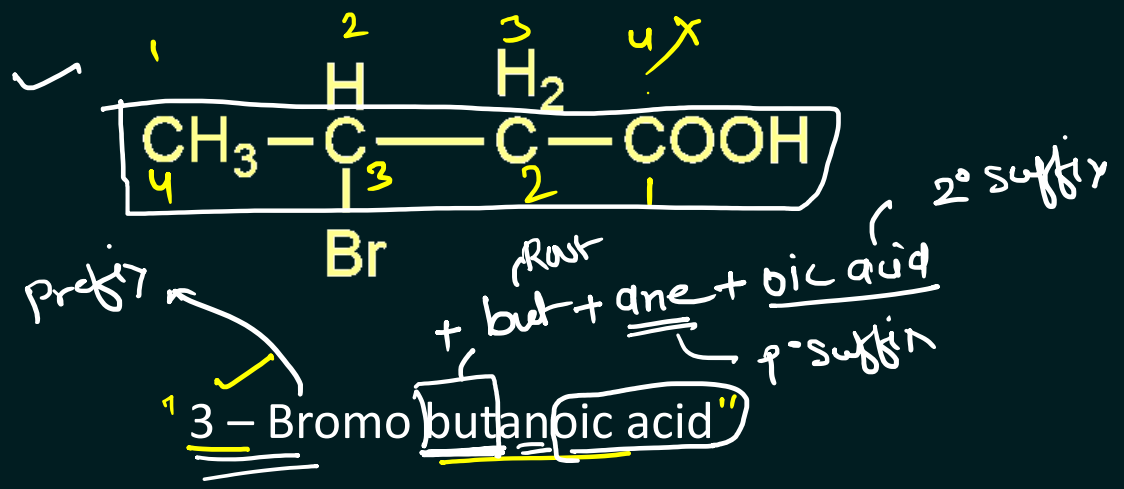
Nomenclature of Organic Compounds

(Part 1/3: Hydrocarbons)

B.Pharm. | POC-I | U 1 | L2

IUPAC SYSTEM OF NOMENCLATURE

- **IUPAC: International Union of Pure and Applied Chemistry**
- In 1957, IUPAC nomenclature system is referred as a systemic approaches to naming of an organic compounds.
- Any given molecular structure has only one IUPAC name, this is the important feature of the IUPAC System.



IUPAC SYSTEM OF NOMENCLATURE

- Salient features of IUPAC system
  - A given compound can be assigned only one name.
  - This can be applied in naming of complex & multifunctional organic compound.
  - This is simple, systematic and scientific method of nomenclature of organic compounds.

Prefix (alphabetically) + Root Word + Suffix

IUPAC SYSTEM OF NOMENCLATURE

- IUPAC System

Prefix (Alphabetically) + Root Word (Alk) + Primary Suffix (ane/ene/yne) + Secondary suffix (main functional group)

- Hydrocarbons- Root Words & Primary Suffix

Chain Length	Root word	Chain Length	Root word
C_1	Meth-	C_{11}	Undec-
C_2	Eth-	C_{12}	Dodec-
C_3	Prop-	C_{13}	Tridec-
C_4	But-	C_{14}	Tetradec-
C_5	Pent-	C_{15}	Pentadec-
C_6	Hex-	C_{16}	Hexadec-
C_7	Hept-	C_{20}	Eicos-
C_8	Oct-	C_{30}	Triacont-
C_9	Non-	C_{40}	Tetracont-
C_{10}	Dec-	C_{50}	Pentacont-

Nature of carbon chain	P-suffix	Generic name
Saturated (C – C)	-ane	Alkane
Unsaturated (C = C) with one double bond	-ene	Alkene
Unsaturated (C ≡ C) with one triple bond	-yne	Alkyne
Unsaturated with two C = C bonds	-diene	Akladiene
Unsaturated with two C ≡ C bonds	-diyne	Alkadiyne
Unsaturated with three C = C bonds	-triene	Alkatriene

alkene

$CH_2=\overset{3}{C}H-\overset{2}{C}H=\overset{1}{C}H_2$

IUPAC SYSTEM OF NOMENCLATURE

IUPAC System

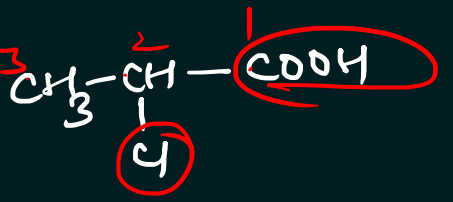
Prefix + Root Word + Primary Suffix (ane/ene/yne) + Secondary suffix (main functional group)

Number of Carbons in chain	Prefix	C-C	C=C	C≡C
1	Meth-	Methane		
2	Eth-	Ethane	Ethene	Ethyne
3	Prop-	Propane	Propene	Propyne
4	But-	Butane	Butene	Butyne
5	Pent-	Pentane	Pentene	Pentyne
6	Hex-	Hexane	Hexene	Hexyne
7	Hept-	Heptane	Heptene	Heptyne
8	Oct-	Octane	Octene	Octyne
9	Non-	Nonane	Nonene	Nonyne
10	Dec-	Decane	Decene	Decyne

IUPAC SYSTEM OF NOMENCLATURE

Prefix + Root Word + Primary Suffix (ane/ene/yne) + Secondary suffix (main functional group)

Functional Group	Secondary suffix	Prefix
Carboxylic acid (-COOH)	-oic acid	Carboxy-
Sulphonic (-SO3H)	-sulphonic acid	Sulfo-
Ester (-COOR)	-oate	Alcoxycarbonyl-
Acid halide (-COX)	-oyl halide	halo carbonyl-
Amide (-CONH2)	-amide/carboxamide	Carbamoyl-
Cyanide (-CN)	-nitrile	Cyano-
Aldehyde (-CHO)	-al	Oxo/Formyl-
Ketone (>CO)	-one-	Oxo-
Alcohol (-OH)	-ol	Hydoxy-
Amine (-NH2)	-amine	Amino-
Alkene (C=C)	-ene	
Alkyne (C=C)	-yne	
Alkane (C-C)	-ane	
Ether (-OR)	-	Alkoxy-
halide (-X)	-	Halo-
Nitro (-NO2)	-	Nitro-



3C = 2-chloro prop + ane + oic acid

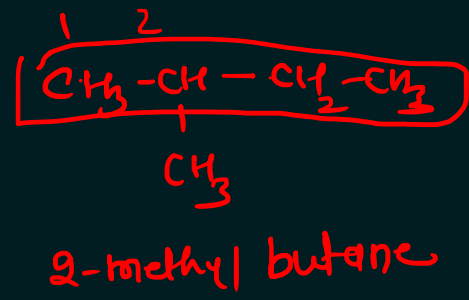
Prefix | Root word | Suffix

2-chloro propanoic acid

IUPAC SYSTEM OF NOMENCLATURE

Hydrocarbon/Alkanes

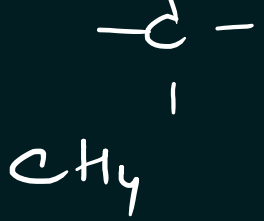
Name	Molecular Formula (C_nH_{2n+2})	Condensed Structural Formula	Prefix name
methane	CH_4	CH_4	Methyl
ethane	C_2H_6	CH_3CH_3	Ethyl
propane	C_3H_8	$CH_3CH_2CH_3$	Propyl
butane	C_4H_{10}	$CH_3CH_2CH_2CH_3$	Butyl
pentane	C_5H_{12}	$CH_3CH_2CH_2CH_2CH_3$	Pentyl
hexane	C_6H_{14}	$CH_3CH_2CH_2CH_2CH_2CH_3$	Hexyl
heptane	C_7H_{16}	$CH_3CH_2CH_2CH_2CH_2CH_2CH_3$	Heptyl
octane	C_8H_{18}	$CH_3CH_2CH_2CH_2CH_2CH_2CH_2CH_3$	Octyl
nonane	C_9H_{20}	$CH_3CH_2CH_2CH_2CH_2CH_2CH_2CH_2CH_3$	Nonyl
decane	$C_{10}H_{22}$	$CH_3CH_2CH_2CH_2CH_2CH_2CH_2CH_2CH_2CH_3$	Decyl

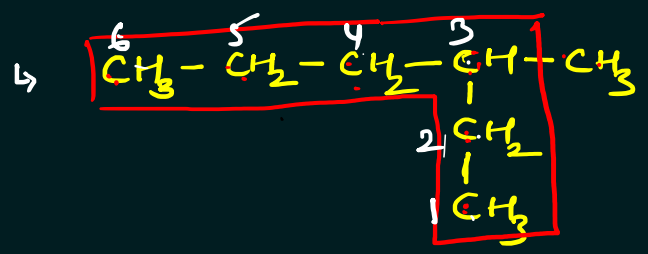


IUPAC SYSTEM OF NOMENCLATURE

Rules for Nomenclature

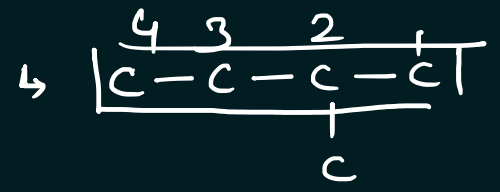
- According to the Guidelines set by IUPAC, the nomenclature of compounds must follow these steps:
  - 1. The Longest Chain Rule
  - 2. Numbering start at the Lowest Set of Locants/branching



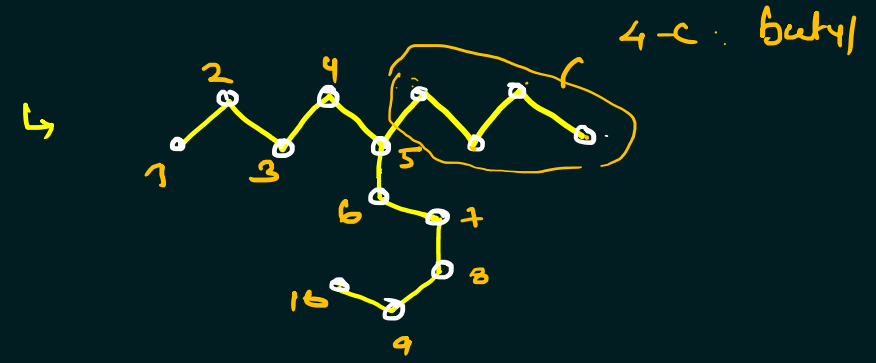


3-methyl + Hex + ane

3-methyl hexane

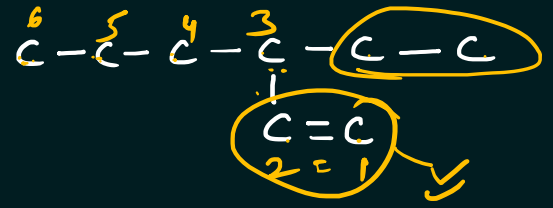


2-methyl butane



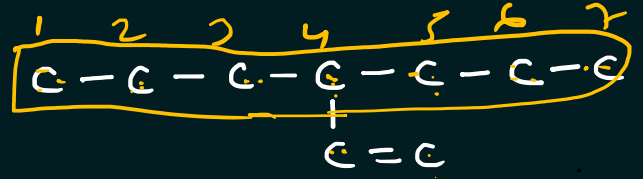
5-butyl Decane

IUPAC SYSTEM OF NOMENCLATURE

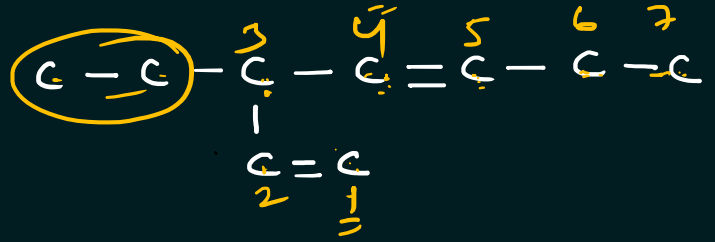


3-ethyl hex-1-ene

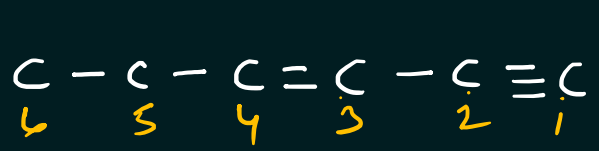
ene
yne
ane



4-Vinyl heptane

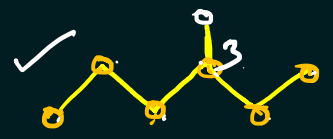


3-ethyl hept-1,4-diene

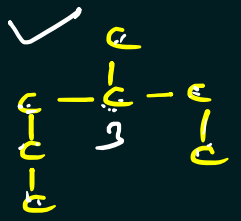


3-hexen-1 yne

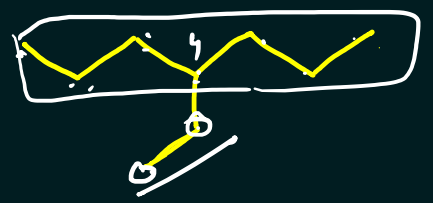
IUPAC SYSTEM OF NOMENCLATURE

↳ 

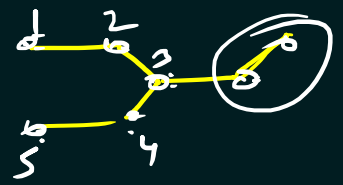
3-methyl hexane

↳ 

3-methyl hexane

↳ 

4-ethyl heptane

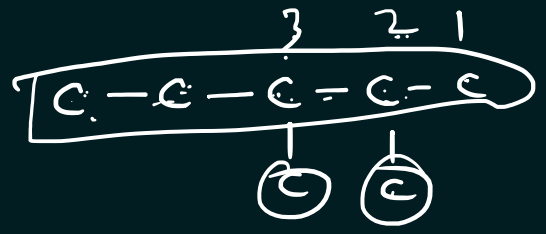
↳ 

3-ethyl pentane

IUPAC SYSTEM OF NOMENCLATURE

Rules for Nomenclature

- 3. Multiple instances of the substituent:
- Prefixes which indicate the total number of the same substituent in the given organic compounds are given, such as di, tri, etc.

↳ 

2,3-dimethyl pentane

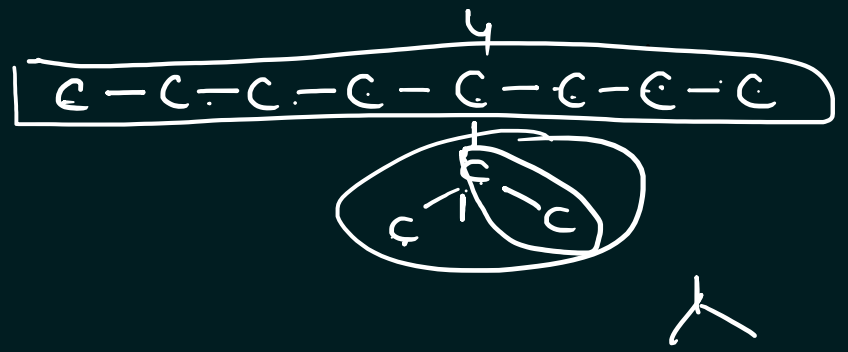
↳ 

2,3,4-trimethyl hexane

IUPAC SYSTEM OF NOMENCLATURE

Rules for Nomenclature

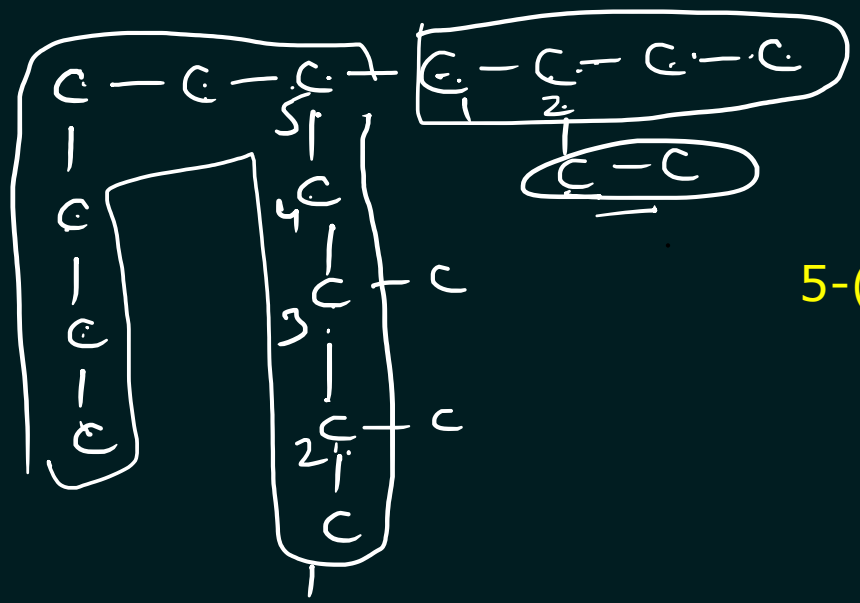
- 4. Naming Complex Substituents: The branched and complex substituents must be written in brackets in the IUPAC nomenclature of the corresponding compounds.



4-(1-methyl ethyl)-octane OR

4-Isopropyl octane

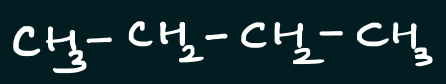
IUPAC SYSTEM OF NOMENCLATURE



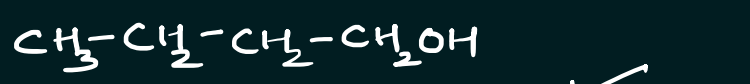
5-(2-Ethylbutyl)-2,3-dimethyldecane

IUPAC SYSTEM OF NOMENCLATURE

- Prefix n- for normal straight continuous chain



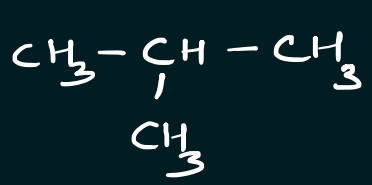
n-butane



n-butanol or n-butyl alcohol

n-pentane

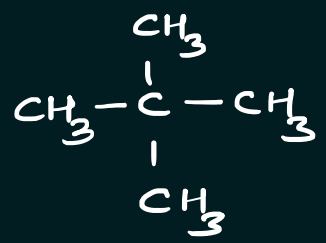
- Prefix Iso- methyl group at 2nd position



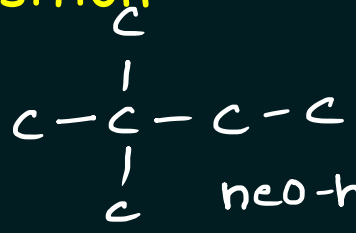
Iso-butane
(2-methyl propane)

Iso-hexane
(2-methyl pentane)

- Prefix neo- two methyl group at 2nd position



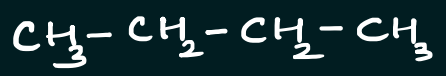
neo-pentane
(2,2-dimethyl propane)



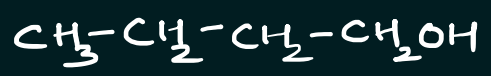
neo-hexane
(2,2- dimethyl butane)

IUPAC SYSTEM OF NOMENCLATURE

- Prefix n- for normal straight continuous chain



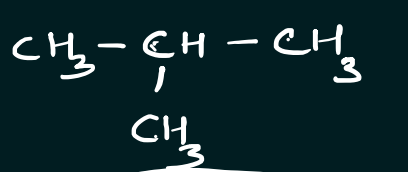
n-butane



n-butanol or n-butyl alcohol

n-pentane

- Prefix Iso- methyl group at 2nd position



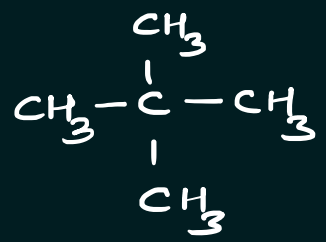
Iso-butane

(2-methyl propane)

Iso-hexane

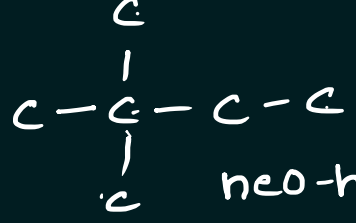
(2-methyl pentane)

- Prefix neo- two methyl group at 2nd position



neo-pentane

(2,2-dimethyl propane)

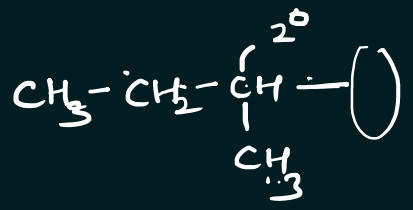


neo-hexane

(2,2- dimethyl butane)

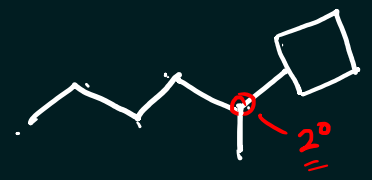
IUPAC SYSTEM OF NOMENCLATURE

Prefix Secondary (Sec)-



Sec. butyl —

(1-methyl propyl)



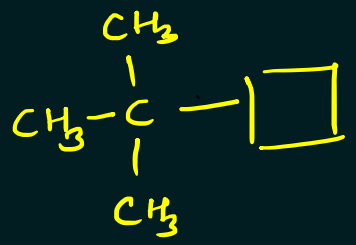
Sec. hexyl —

(1-methyl pentyl)

Iso butyl —

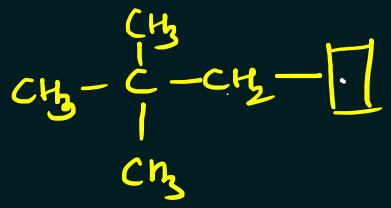
2-methyl propyl

Prefix Tartary (Ter)-



tert-butyl

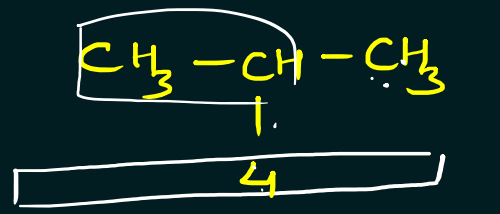
(1,1-dimethyl ethyl)



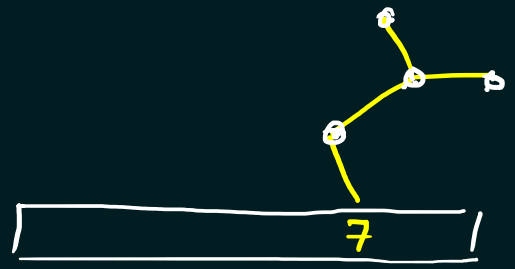
neo pentyl

(2,2-dimethyl propyl)

IUPAC SYSTEM OF NOMENCLATURE

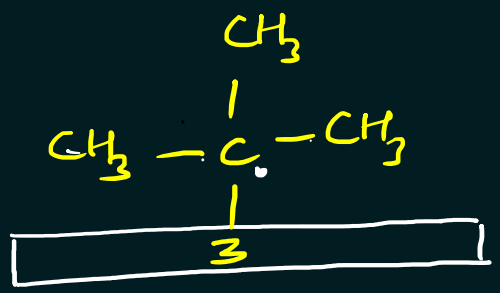


4-isopropyl ——

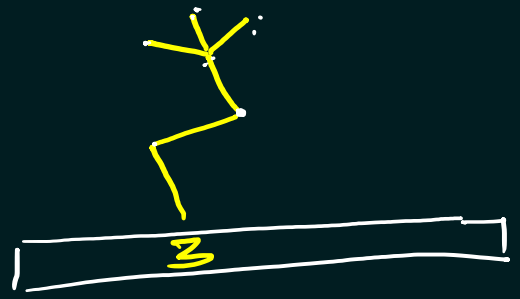


7- Isobutyl

7(2-me propyl



3-(tert-butyl) –



3- neohexyl

#4

IUPAC

Nomenclature of Organic Compounds

(Part 2/2: Hydrocarbons with Functional Groups)

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IUPAC SYSTEM OF NOMENCLATURE

IUPAC System

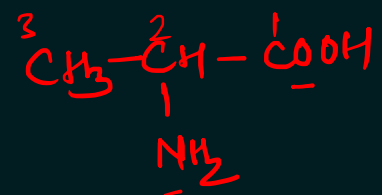
Prefix + Root Word + Primary Suffix (ane/ene/yne) + Secondary suffix (main functional group)

Number of Carbons in chain	Prefix	C-C ane	C=C ene	C≡C yne
1	Meth-	Methane		
2	Eth-	Ethane	Ethene	Ethyne
3	Prop-	Propane	Propene	Propyne
4	But-	Butane	Butene	Butyne
5	Pent-	Pentane	Pentene	Pentyne
6	Hex-	Hexane	Hexene	Hexyne
7	Hept-	Heptane	Heptene	Heptyne
8	Oct-	Octane	Octene	Octyne
9	Non-	Nonane	Nonene	Nonyne
10	Dec-	Decane	Decene	Decyne

IUPAC SYSTEM OF NOMENCLATURE

Prefix + Root Word + Primary Suffix (ane/ene/yne) + Secondary suffix (main functional group)

Functional Group	Secondary suffix	Prefix
Carbonxylic acid (-COOH)	-oic acid	Carboxy-
Sulphonic (-SO3H)	-sulphonic acid	Sulfo-
Ester (-COOR)	-oate	Alcoxycarbonyl-
Acid halide (-COX)	-oyl halide	halo carbonyl-
Amide (-CONH2)	-amide/carboxamide	Carbamoyl-
Cyanide (-CN)	-nitrile	Cyano-
Aldehyde (-CHO)	-al	Oxo/Formyl-
Ketone (>CO)	-one-	Oxo-
Alcohol (-OH)	-ol	Hydoxy-
Amine (-NH2)	-amine	Amino-
Alkene (C=C)	-ene	
Alkyne (C=C)	-yne	
Alkane (C-C)	-ane	
Ether (-OR)	-	Alkoxy-
halide (-X)	-	Halo-
Nitro (-NO2)	-	Nitro-



2-Amino propanoic acid

IUPAC SYSTEM OF NOMENCLATURE

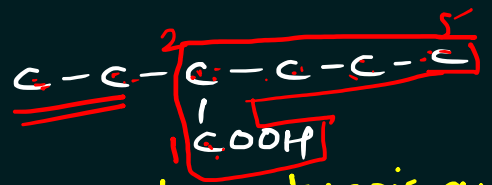
Carboxylic Acids (-COOH) - Secondary Suffix - Oic acid

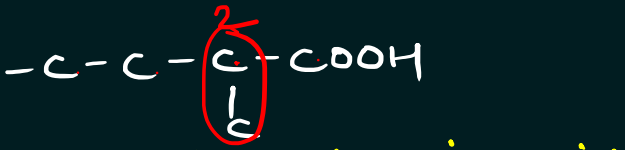
$HCOOH$ - Methanoic acid
Formic Acid = Methanoic acid

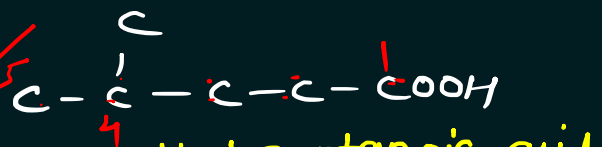
CH_3-COOH - Ethanoic acid
Acetic acid

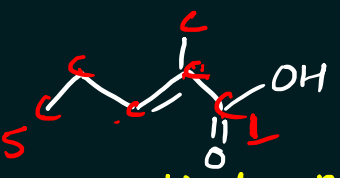
$(COOH)_2$ Oxalic acid
Ethanedioic acid

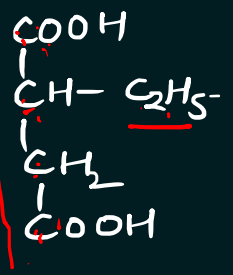
$C-C-C-C-COOH$
Pentanoic acid


2-ethyl pentanoic acid


2-methyl pentanoic acid

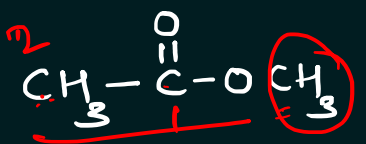

4-methyl pentanoic acid


2-methyl 2-pentenoic acid

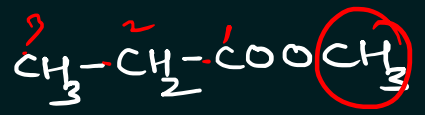

2-ethyl 1,4-butanedioic acid

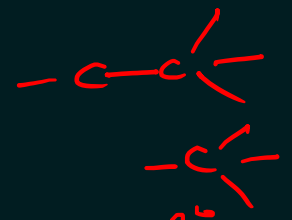
IUPAC SYSTEM OF NOMENCLATURE

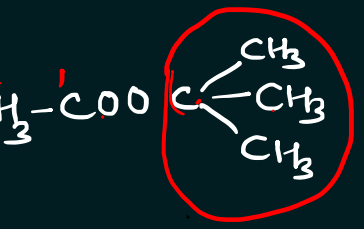
Ester (-COOR) - Secondary Suffix - Oate

 Methyl ethanoate (methyl acetate)

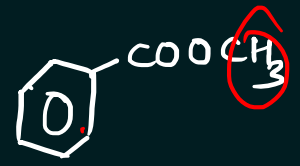
CH_3-COOH – Acetic acid
CH_3COONa Sod. Acetate
CH_3-CH_3 methyl acetate

 – Methyl propanoate



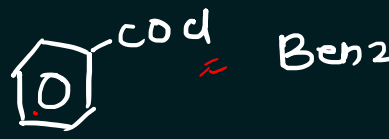
 – tert-butyl ethanoate

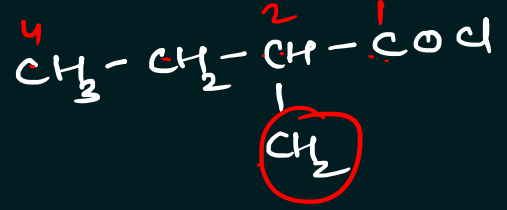
$CH_3-\underset{\underset{O}{\|}}{C}-O-C<$

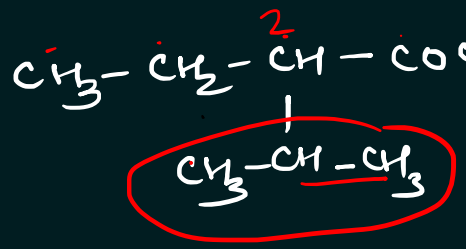
 methyl benzoate

IUPAC SYSTEM OF NOMENCLATURE

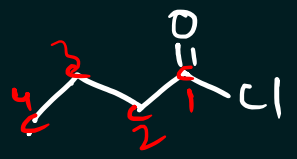
Oyl halide (-COX) - Secondary Suffix - Oyl halide

\#  Benzoyl chloride

\#  2-methyl butanoyl chloride

\#  2-isopropyl butanoyl chloride

2-(1-methylethyl) —

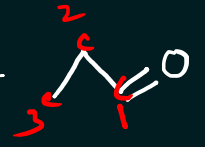
\#  Butanoyl chloride

(Butyryl chloride)

IUPAC SYSTEM OF NOMENCLATURE

Ketone/Aldehyde (-COR/ -CHO) - Secondary Suffix - Aldehyde- al and Ketone- one

one al

 Propanal CH_3-CH_2-CHO

$CH_3-CH(CH_3)-CH_2-CHO$ 3-methyl butanal

$CH_2=C(CH_3)-CH_2-CHO$ 3-methyl but-3-enal OR 3-methyl 3-butenal

CH_3-CHO - (Acetaldehyde) Ethanal

$HCHO$ (formaldehyde) Methanal

$CH_3-CO-CH_3$ (Acetone) Propanone

$CH_3-CO-C_2H_5$ 2-butanone

$CH_2=C(CH_3)-COCH_3$ 3-methyl 3-buten-2-one

 2,4-pentanedione

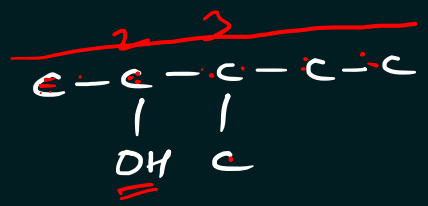
$-\overset{O}{\overset{\|}{C}}-OR$

$-COOR$ $-COR$ $-OR$ $R-\overset{O}{\overset{\|}{C}}-R$ $-O-R$

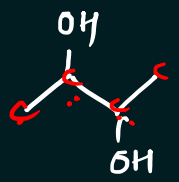
IUPAC SYSTEM OF NOMENCLATURE

Alcohol (-OH) - Secondary Suffix - ol

CH_3-CH_2-OH (Ethyl alcohol) – Ethanol



3-methyl-2-pentanol



2,3-butanediol

$CH_2=CH-CH_2-OH$

~~2~~-propenol

prop-2-en-1-ol

IUPAC SYSTEM OF NOMENCLATURE

Amine (-NH2) - Secondary Suffix - amine

Prefix = amino — IUPAC

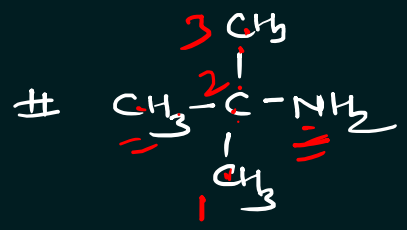
$CH_3-CH_2-CH_2-CH_2-NH_2$

1° Amine

1 - amino butane – IUPAC

Butanamine – CA name (Chemical Abstract)

n-butyl amine - Common name



2-amino-2-methyl propane

2-methyl 2-propan amine

tert-butylamine

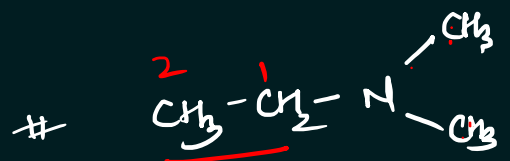
$CH_3-CH_2-CH_2-NH-CH_3$

2° Amine

1-methyl-amino-propane

N-methyl propanamine

methyl propyl amine



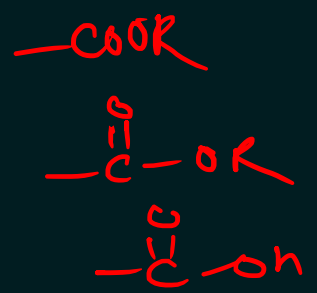
Dimethyl amino ethane

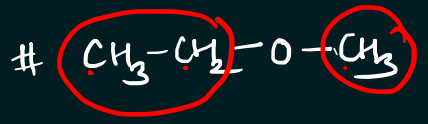
N,N-dimethyl ethanamine

ethyl dimethyl amine

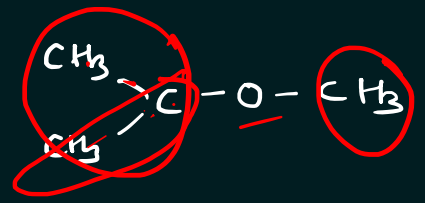
IUPAC SYSTEM OF NOMENCLATURE

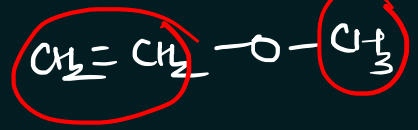
Ether (R-O-R) - Secondary Suffix - ether

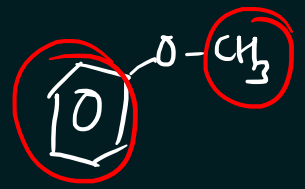


 - Ethyl methyl ether

$C_2H_5-O-C_2H_5$ = diethyl ether

 isopropyl methyl ether
1-methyl ethyl methyl ether

 methyl vinyl ether

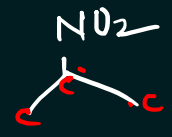
 methyl phenyl ether
(Anisole)

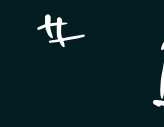
IUPAC SYSTEM OF NOMENCLATURE

Halide (-X)- prefix - Halo, and Nitro (-NO2)- prefix -Nitro

$CH_3-CH_2-CH_2-NO_2$ - Nitropropane

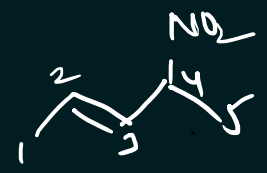
CH_3-CH_2-Cl - Chloro ethane

 - 2-nitro propane

 - Chloro benzene

 - ~~5-nitro pentene~~ 4-nitro but-ene

$CH_2(Cl)-CH_2-CH(Cl)-CH_3$ 1,3-dichloro butane

 - 4-nitro pent-2-ene

#5

IUPAC

Nomenclature of Organic Compounds

(Part 3/3: Hydrocarbons with multiple Functional Groups)

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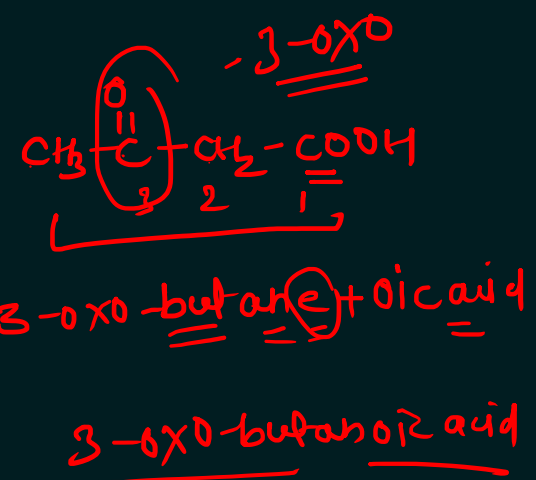
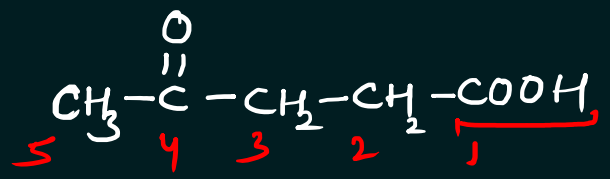
IUPAC SYSTEM OF NOMENCLATURE

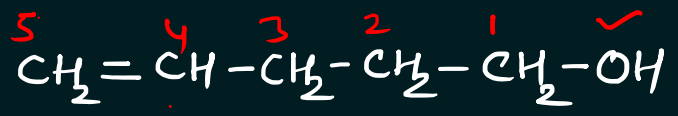
	Functional Group	Secondary suffix	Prefix	
1	Carbonxylic acid (-COOH)	-oic acid	Carboxy-	Kab
2	Sulphonic (-SO3H)	-sulphonic acid	Sulfo-	soni
3	Ester (-COOR)	-oate	Alcoxycarbonyl-	is
4	Acid halide (-COX)	-oyl halide	halo carbonyl-	Hal
5	Amide (-CONH2)	-amide/carboxamide	Carbamoyl-	Me
6	Cyanide (-CN)	-nitrile	Cyano-	Cyanide pee rhi hai
7	Aldehyde (-CHO)	-al	Oxo/Formyl-	aur
8	Ketone (>CO)	-one-	Oxo-	ketto
9	Alcohol (-OH)	-ol	Hydoxy-	Daru pi rahi
10	Amine (-NH2)	-amine	Amino-	Aur amine
11	Alkene (C=C)	-ene		
12	Alkyne (C≡C)	-yne		
13	Alkane (C-C)	-ane		
14	Ether (-OR)	ether	Alkoxy-	idhar
15	halide (-X)	-	Halo-	halo
16	Nitro (-NO2)	-	Nitro-	Kar rhi hai natch ke



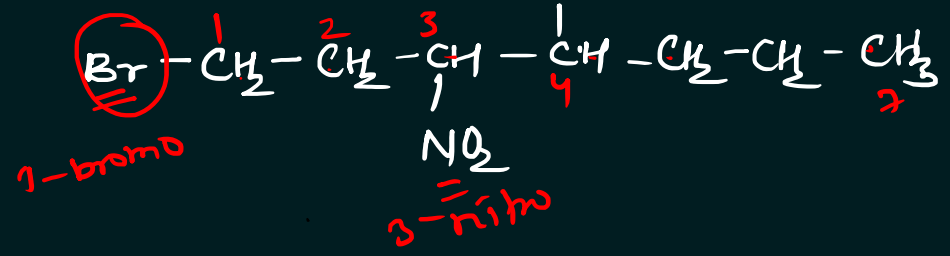
IUPAC SYSTEM OF NOMENCLATURE

\# 

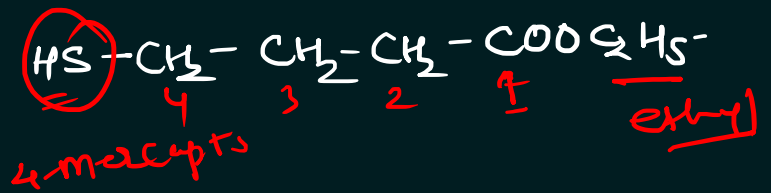
4-oxo-pentanoic acid.

\# 

Pent-4-ene-1-ol or 4-pentenol

\# 

1-bromo-4-chlro-3-nitro heptane

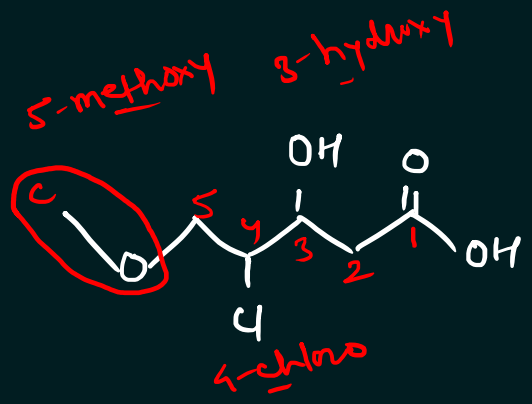
\# 

ethyl-4-mercapto-butanoate

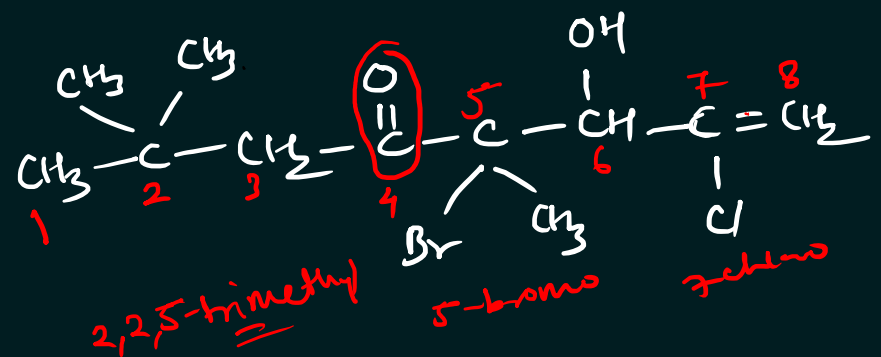
IUPAC SYSTEM OF NOMENCLATURE

\# 

5-oxo-hexane nitrile

\# 

4-chloro-3-hydroxy-5-methoxy pentanonic acid

\# 

5-bromo-7-chloro-6-hydroxy-2,2,5-trimethyl-7-octen-4-one"

#6

IUPAC

Nomenclature of Carbocyclic Compounds

Cycloalkanes

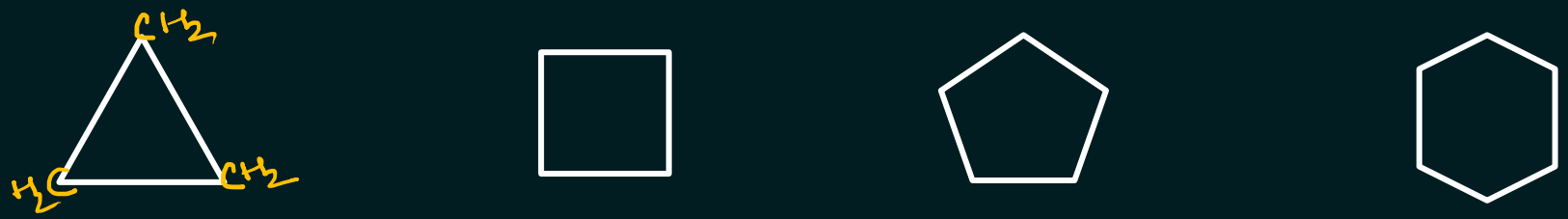
B.Pharm. | POC-I | U 1 | L5

IUPAC SYSTEM OF NOMENCLATURE

IUPAC System for Carbo-Cyclic Compounds

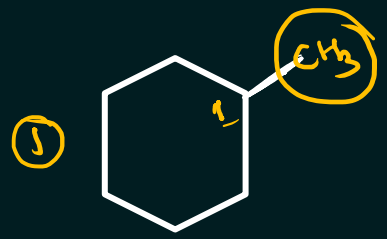
- Carbocyclic Compounds: Cyclic compounds made of Carbon atoms (Homocyclic Compounds).
  - Saturated Alicyclic compounds- **Cycloalkane**
  - Unsaturated Alicyclic Compounds- Cycloalkens
  - Aromatic compounds- Arenes

Substitution (alphabetically) + Cyclo +Root Word + ane/ene/yne + Suffix (Func. group)

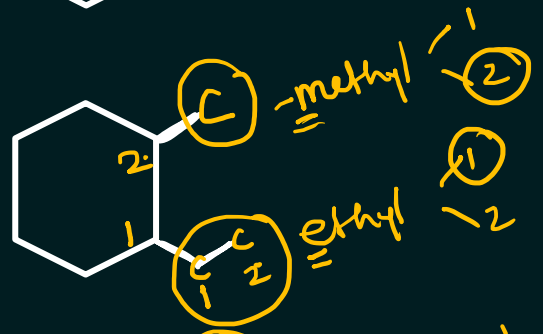


Cyclopropane Cyclobutane Cyclopentane Cyclohexane

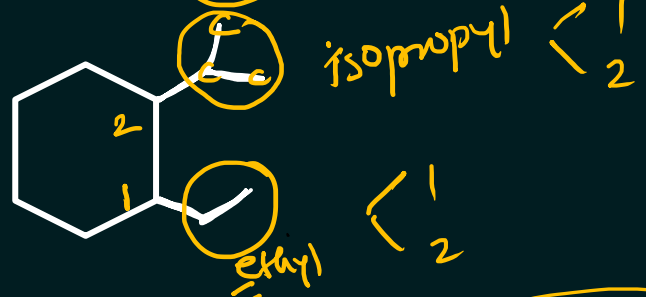
IUPAC SYSTEM OF NOMENCLATURE



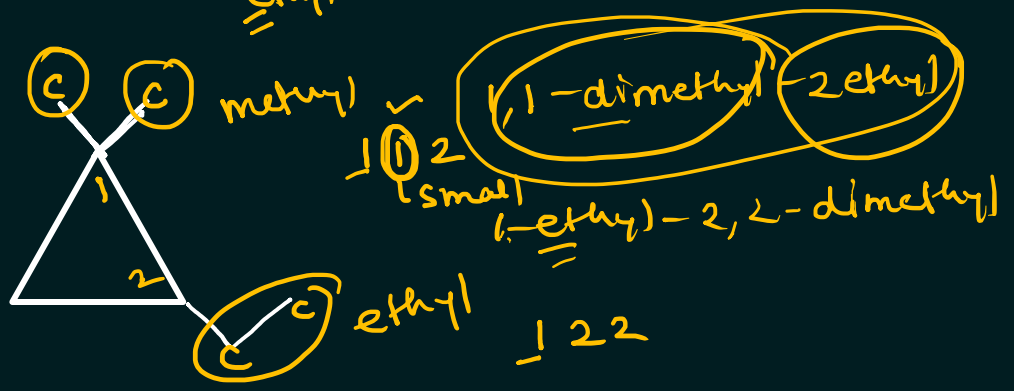
1-methyl cyclohexane



1-ethyl-2-methyl cyclohexane

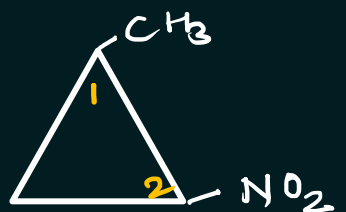


1-ethyl-2-isopropyl cyclohexane



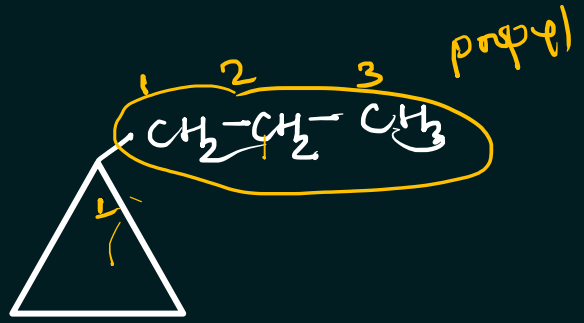
2-ethyl-1,1-dimethyl cyclopropane

IUPAC SYSTEM OF NOMENCLATURE

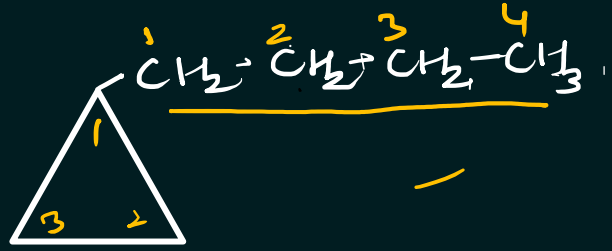


1-methyl-2-nitro cyclopropane

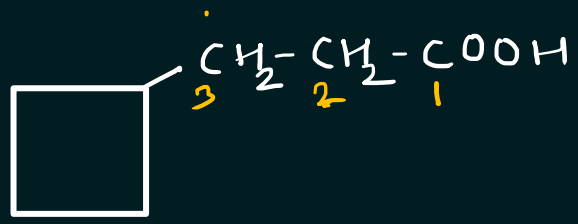
Rules - Root word - Same carbon no. — ① Ring > open chain
② ↑ no carbon atm is preferry
③ FG > Ring =|≡ > no. of C.-atm



1-propyl cyclopropane

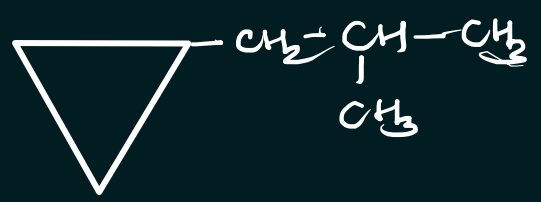


1-cyclopropyl butane

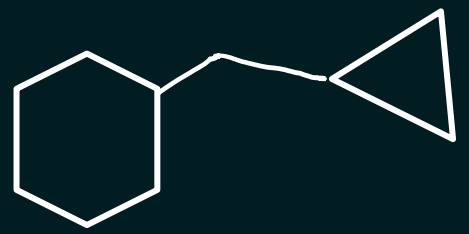


3-cyclobutyl propanoic acid

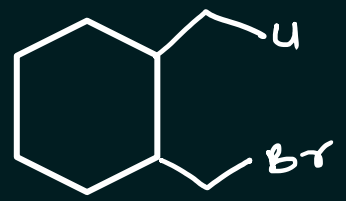
IUPAC SYSTEM OF NOMENCLATURE



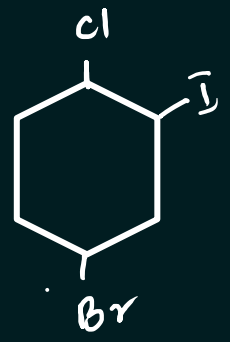
1-(2-methy propyl) cyclopropane



1-(1-cyclopropyl methyl) cyclohexane

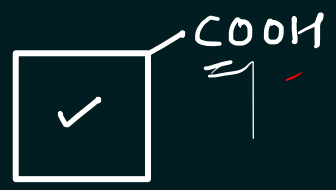


1-bromomethyl-2-chloromethyl cyclohexane

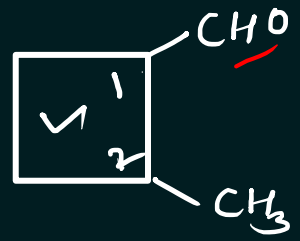


4-bromo-1-chloro-2-iodo cyclohexane

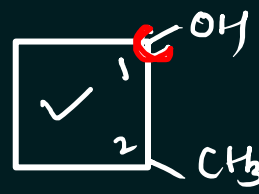
IUPAC SYSTEM OF NOMENCLATURE



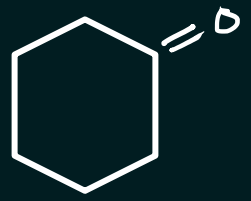
Cyclobutane carboxylic acid



2-methyl cyclobutane carbaldehyde

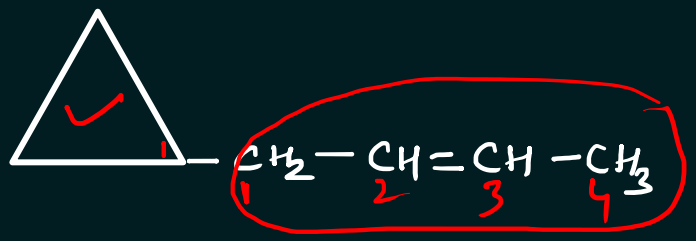


2-methyl cyclobutanol

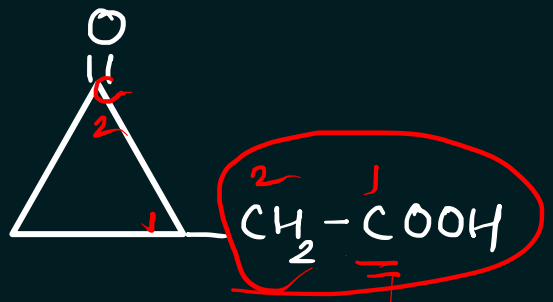


Cyclohexanone

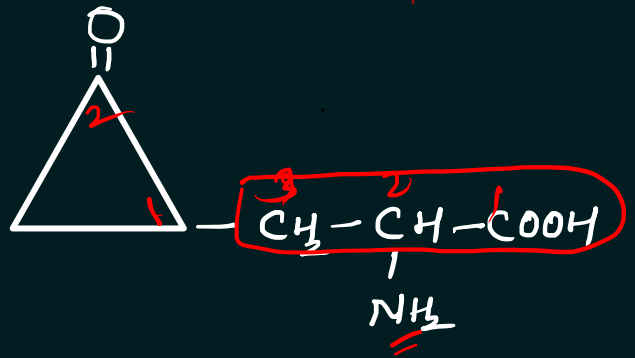
IUPAC SYSTEM OF NOMENCLATURE



1-(but-2-enyl) cyclopropane



2-(2-oxo cyclopropyl) ethanoic acid



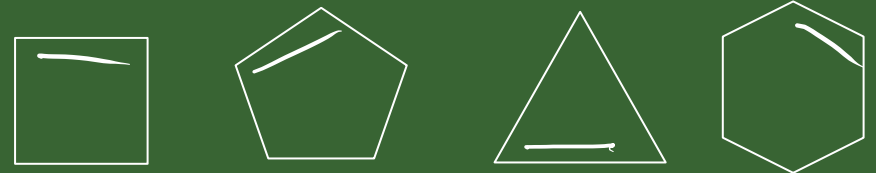
2-amino-3-(2-oxocyclopropyl)propanoic acid

#7

IUPAC

Nomenclature of

Carbocyclic Compounds



Cycloalkenes

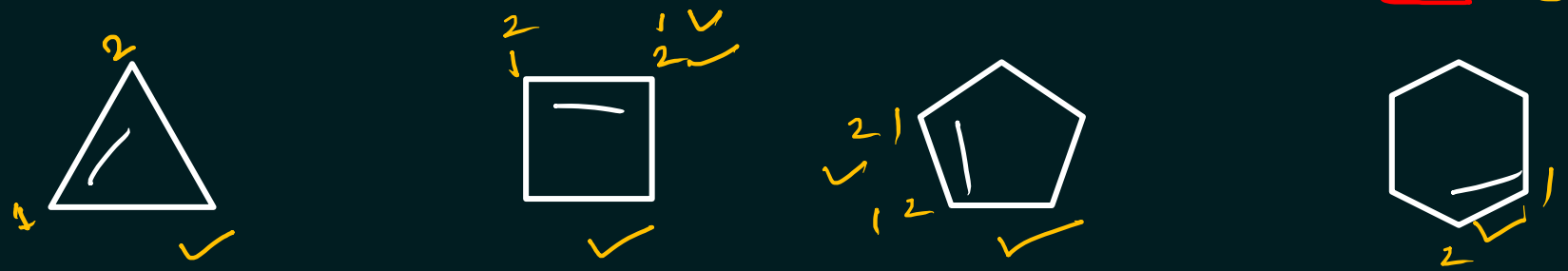
B.Pharm. | POC-I | U 1 | L6

IUPAC SYSTEM OF NOMENCLATURE

IUPAC System for Carbo-Cyclic Compounds

- Carbocyclic Compounds: Cyclic compounds made of Carbon atoms (Homocyclic Compounds).
  - Saturated Alicyclic compounds- Cycloalkane.
  - Unsaturated Alicyclic Compounds- **Cycloalkanes**
  - Aromatic compounds- Arenes

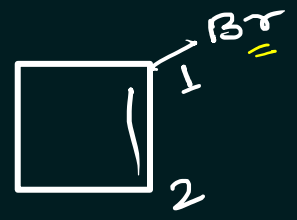
Substitution (alphabetically) + Cyclo +Root Word + ane/ene/yne + Suffix (Func. group)



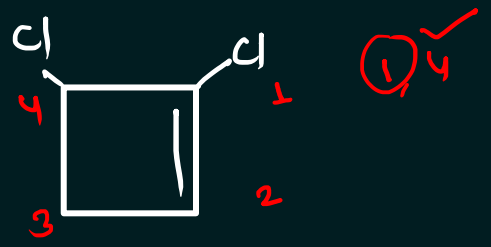
Cyclopropene Cyclobutene Cyclopentene Cyclohexene

IUPAC SYSTEM OF NOMENCLATURE

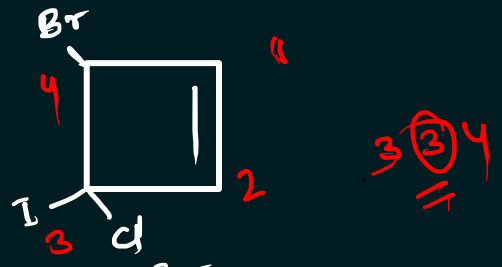
Rule → no. system - ① = in lowest no
② substitution - lowest



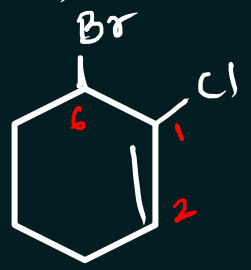
1-bromocyclobutene



1,4-dichloro cyclobut-1-ene



4-bromo-3-chloro-3-iodo cyclobut-1-ene

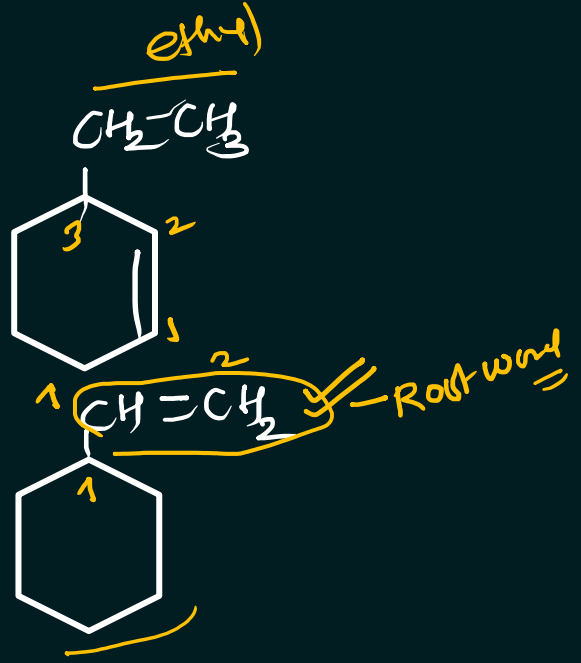


6-bromo-1-chloro cyclohex-1-ene

IUPAC SYSTEM OF NOMENCLATURE

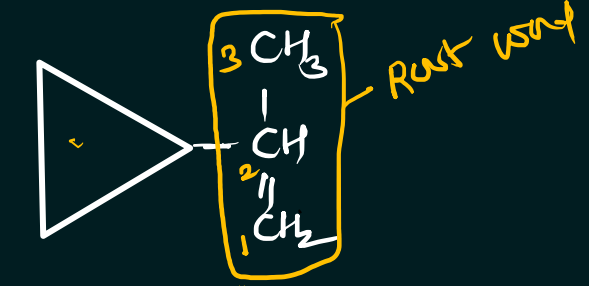
Rule # Same # carbon-atom Ring > open chain

Func. gp > =/≡ > no. of C. atm

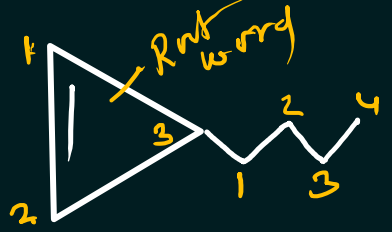


3-methyl cyclohex-1-ene

Cyclohexyl ethene

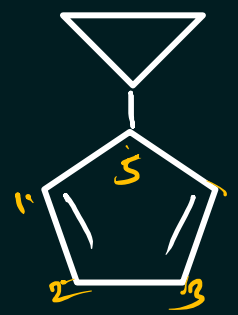


2-cyclopropyl prop-1-ene

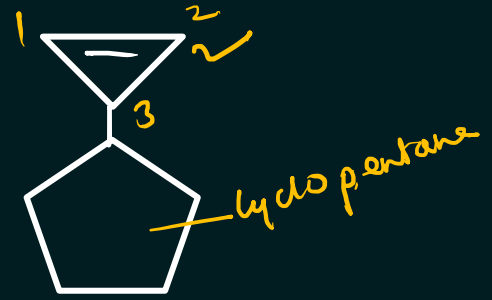


3-butyl cycloprop-1-ene

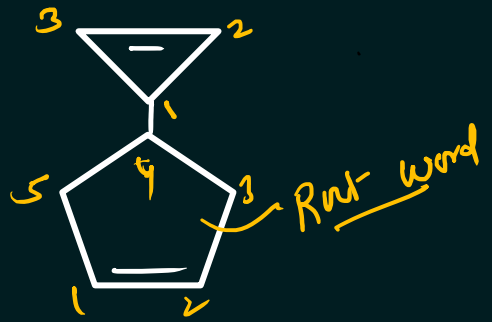
IUPAC SYSTEM OF NOMENCLATURE



5-cyclopropyl cyclopent-1,3-diene

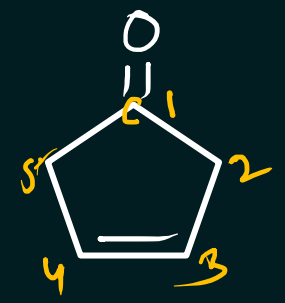


3-cyclopentyl cycloprop-1-ene

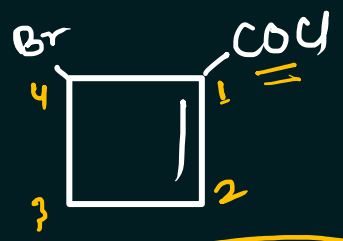


4-(cycloprop-2-en-1-yl) cyclopent-1-ene

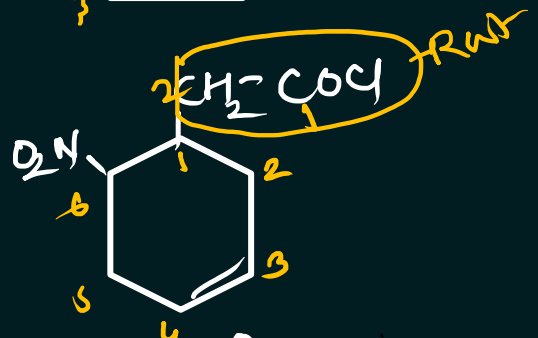
IUPAC SYSTEM OF NOMENCLATURE



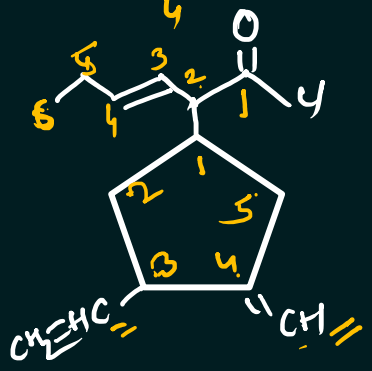
Cyclopent-3-en-1-one



4-bromo cyclobute-1-ene carbonyl chloride



2-(6-nitro cyclohex-3-en-1-yl) ethanoyl chloride



2-(3-ethenyl-4-methylidene cyclopentyl) hex-3-eneoyl chloride

#7

IUPAC

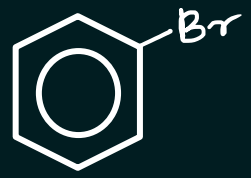
Nomenclature of Benzene and Related Compounds

B.Pharm. | POC-I | U 1 | L6

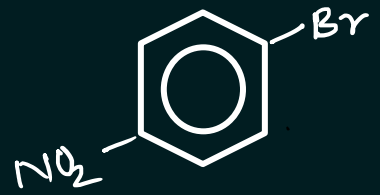
IUPAC SYSTEM OF NOMENCLATURE

Cyclo-1,3,5-triene

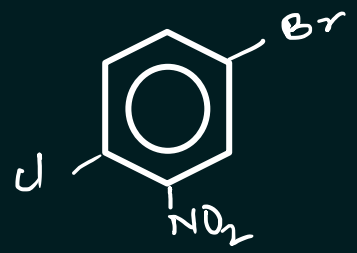
Benzene



1-bromo benzene



1-bromo-4-nitro benzene

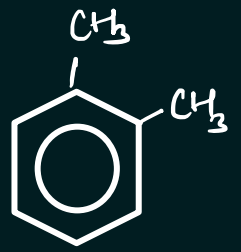


4-bromo-1-chloro-2-nitro benzene

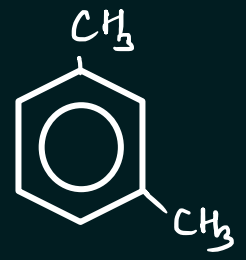
IUPAC SYSTEM OF NOMENCLATURE

1-methyl benzene

(Toluene)



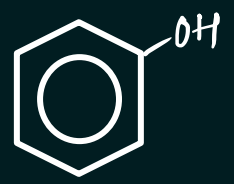
1,2-dimethyl benzene



1,3-dimethyl benzene

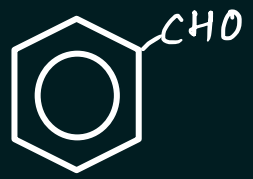
1,4-dimethyl benzene

IUPAC SYSTEM OF NOMENCLATURE



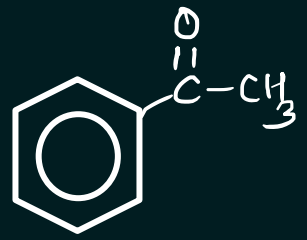
Benzene-1-ol

Phenol



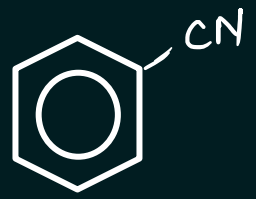
Benzene-1-al

Benzene carbaldehyde or Benzaldehyde



Methyl phenyl ketone / Acetophenone

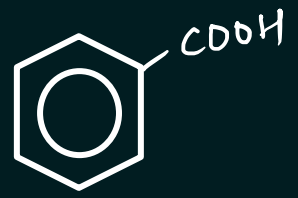
1-phenyl ethen-1-one



Benzonitrile

Benzene carbonitrile

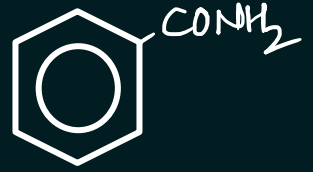
IUPAC SYSTEM OF NOMENCLATURE



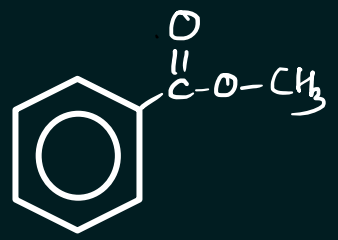
Benzene-1-oic acid

Benzoic acid or benzene carboxylic acid

Benzoyl Chloride or Benzene carbonyl chloride



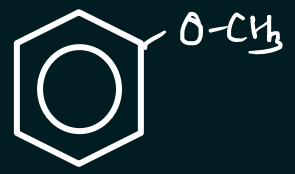
Benzamide or Benzene carboxamide



Methyl Benzoate

Methyl Benzene carboxylate

IUPAC SYSTEM OF NOMENCLATURE

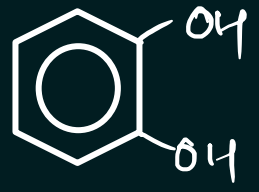


Methoxy Benzene

Amino Benzene

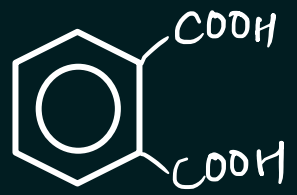
Benzenamine

Aniline



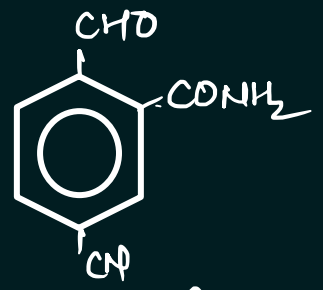
Catechol

Benzene-1,2-diol

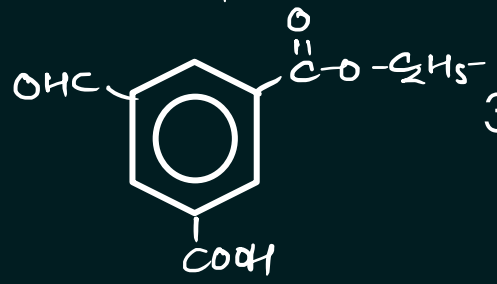


Benzene-1,2-dicarboxylic acid

IUPAC SYSTEM OF NOMENCLATURE



5-cyano-2-formyl benzamide



3-ethoxy carbonyl-5-formyl-benzoic acid