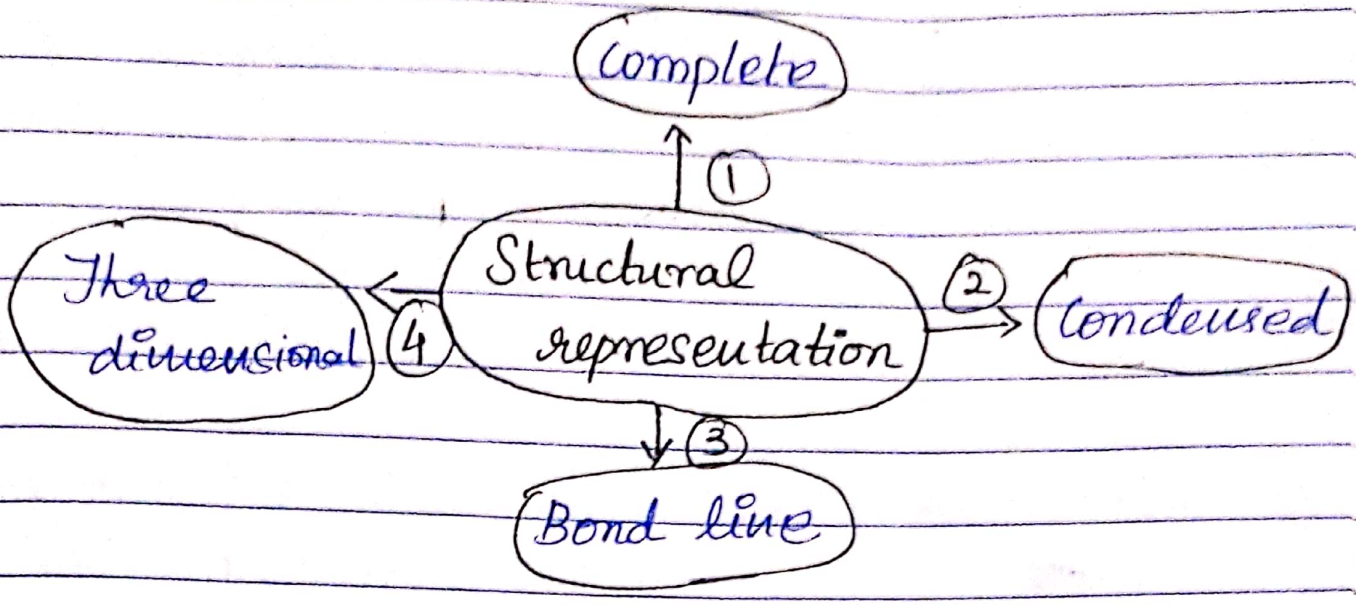
STRUCTURAL REPRESENTATION

Topic - ORGANIC CHEMISTRY

SUBJECT - chemistry
CLASS LEVEL - XI
AUTHOR - S. Pavani
CONCEPT ABSTRACT - In this concept we are going to see about the different types of structural representation.

REFERENCE -

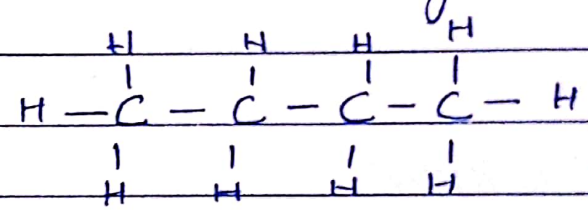
1. NCERT - chemistry (Part - 2)
2. Hand book - chemistry (arihant)



Terms, definitions and Symbols.

1) **Complete formula** — All the bonds present between any two atoms are shown clearly.

eg.



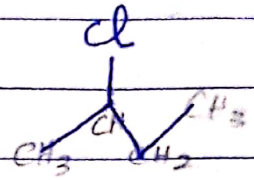
2) **Condensed formula** — Resulting expression of a compound, all where the bonds are not shown clearly.

eg. $CH_3CHCH_2CH_3$ (Cl on the second carbon)

3) **Bond line formula** — - Every fold and free terminal represents a carbon and lines represent the bond.

- In these formulae, it is assumed that required number of H-atoms are present (to satisfy tetravalency of carbon).

eg.

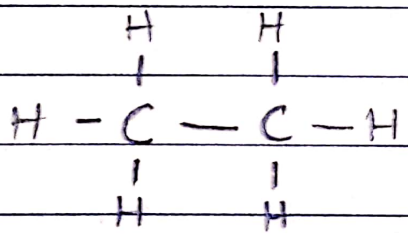


④ Solid-wedge (◄) — Used to indicate a bond projecting out of the plane, towards the observer

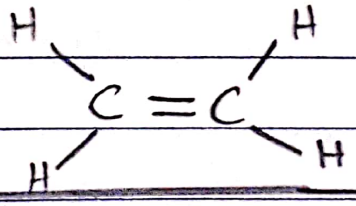
⑤ Dashed-wedge (···||) — Used to depict the bond projecting out of the plane, away from the observer.

INFOGRAPHICS

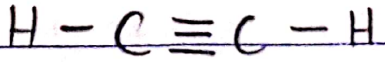
① Ethane (Complete formula)



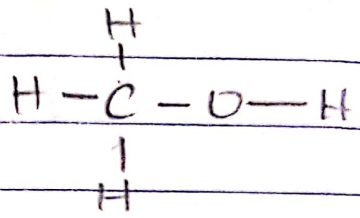
② Ethene (complete formula)



③ Ethyne (Complete formula)



④ Methanol



⑤ Ethane
(a) condensed and (b) bond line formula)

a) CH_3CH_3

b)

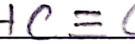
⑥ Ethene
(a) condensed
b) bond line formula)

a) $H_2C=CH_2$

b) 

⑦ Ethyne
(a) condensed
b) bond line formula)

a) $HC\equiv CH$

b) 

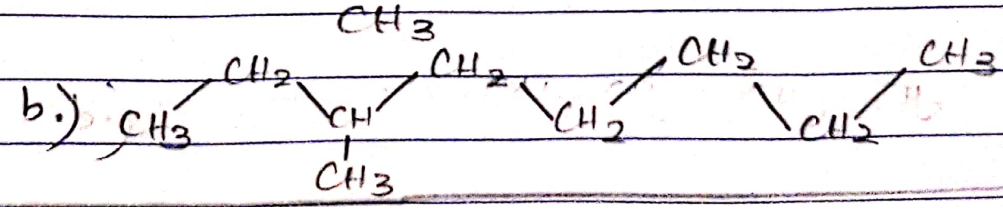
⑧ Methanol
(a) condensed
b) bond line formula)

a) CH_3OH

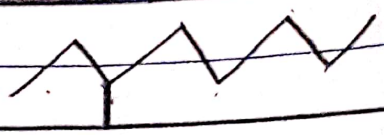
b) 

⑨ 3-Methyloctane
a) condensed
b) complete
c) bond line

a) $CH_3CH_2CH(CH_3)CH_2CH_2CH_2CH_2CH_3$

b) 

c.)



(10.) 2-bromo butane

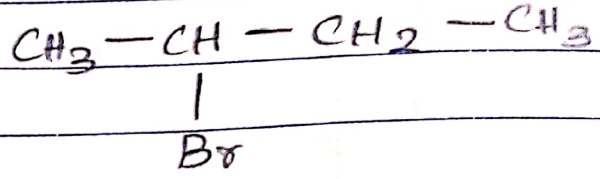
a.) condensed

b.) complete

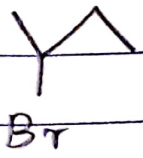
c.) bond line.

a.) $CH_3CHBrCH_2CH_3$

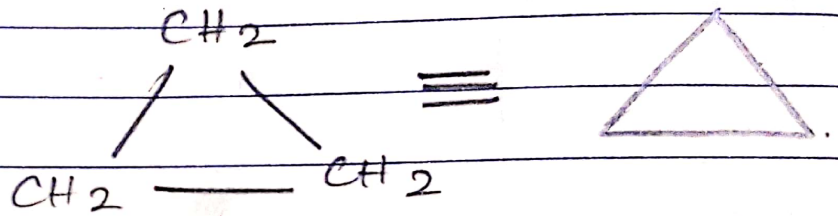
b.)



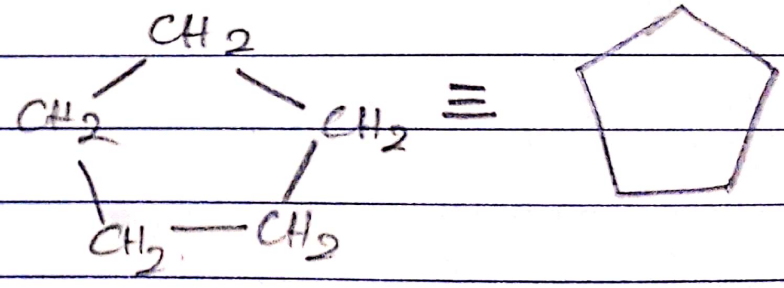
c.)



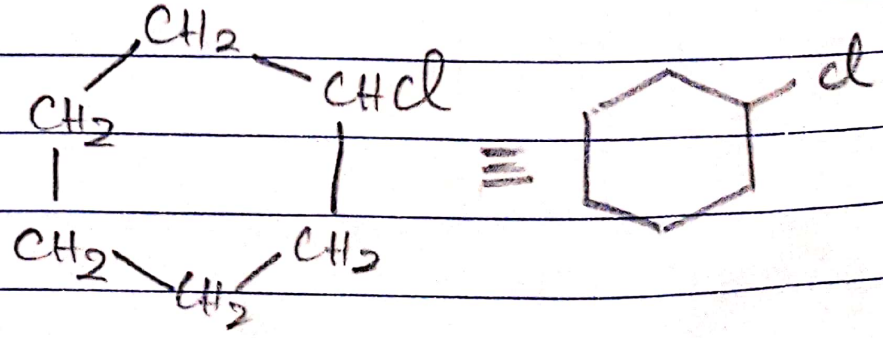
(11.) Cyclopropane bond line



(12.) Cyclopentane bond line

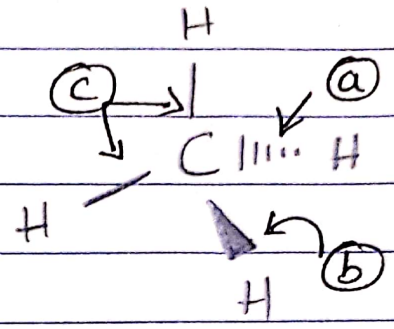


(13.) Chlorocyclo-hexane



(4) Three-dimensional representation of CH_4

a.) dashed wedge
b.) Solid wedge
c.) bonds in the plane of paper



MNEMONICS

C - Complete.
Cd - Condensed
B - Bond line
3D - Three dimensional

CCdB3D

Structural Representation

1. Structures of organic compounds are represented in _____ ways. [1]

2. _____ groups is denoted at the terminals in bond-line. [1]

3. Represent 3-methyloctane in condensed, complete and bondline forms. [3]

4. Represent 2-bromobutane in condensed, complete and bondline forms. [3]

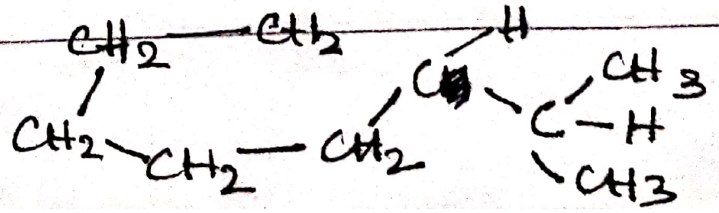
5. Represent these condensed foormulae in bond line. [5]

a) $HO(CH_2)_3CH(CH_3)CH(CH_3)_2$.

b) $HOCH(CN)_2$.

c) $CH{\equiv}CCH_2CH_2CH_3$

d) $CH_3CH_2CH_2CH_2CH_2CH_2CH_2CH_3$

e) 

(6.) Draw the structure for the following [10]

a.) 2,5-Dimethylheptane

b.) 3-Methylpentanenitrile.

c.) 3-Bromo-3-chloroheptane

d.) 4-chlorobutanal.

e.) Propylbenzene.

(7.) Draw the structure for the following [6]

a.) Iso propyl alcohol

b.) 2,3-dimethyl butanal

c.) Heptan-4-one.

(8.) Types of molecular models used for 3-D representation of organic molecules. [1]

(9.) Bond-line structure for: [1]