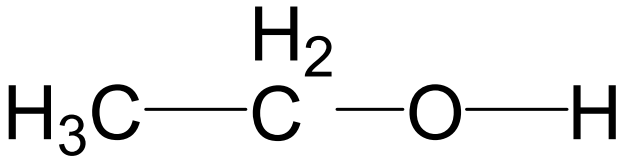
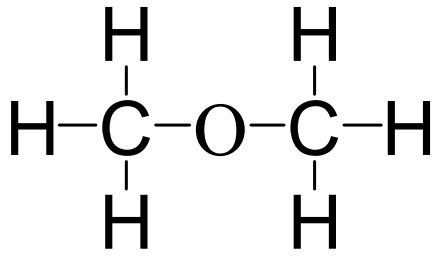


C_2H_6O
Mol. Wt.: 46.06844

Isomers

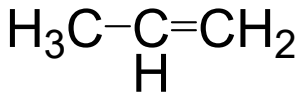


C_2H_6O
Mol. Wt.: 46.06844

C_3H_6

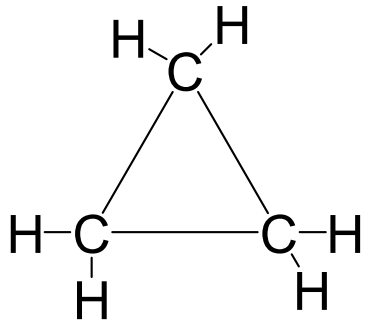
The maximamm number of H atoms that the compound can have = 2 X n+2

Each pair of hydrogen atoms less that the maximamm hydrogen atoms that the compund can have = a double bond or a cycle



C_3H_6

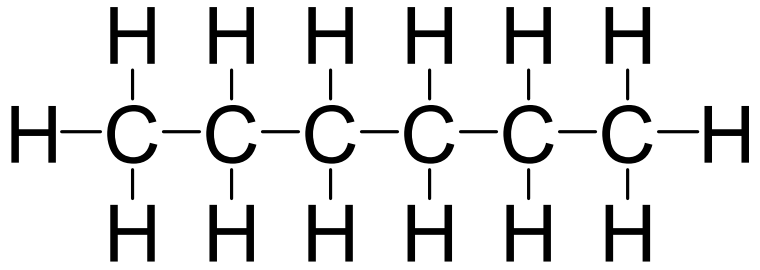
Acyclic



C_3H_6

Cyclic

C_6H_{14}

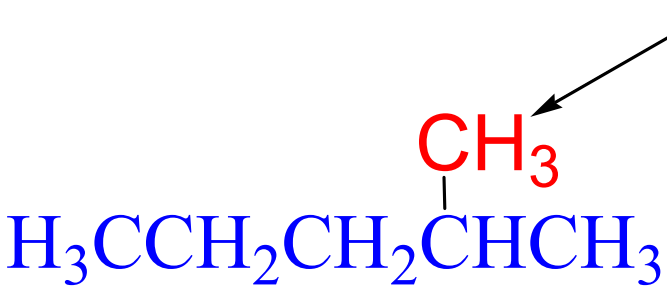


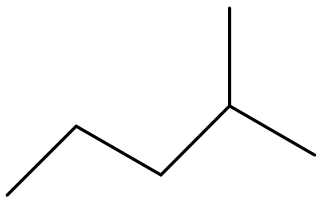
$H_3CCH_2CH_2CH_2CH_2CH_3$ Condensed

Sckeletal

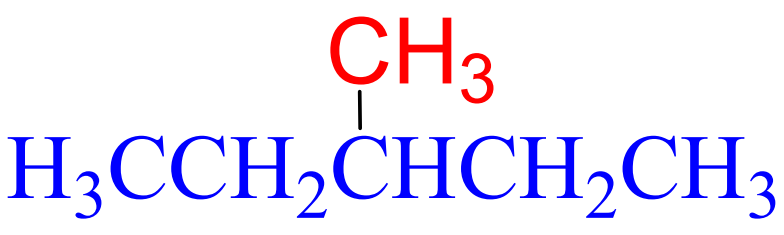
Branched

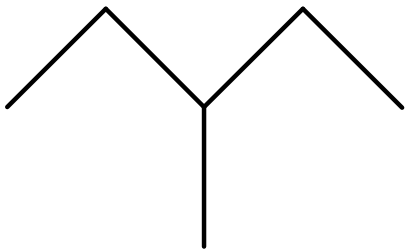
Substitution



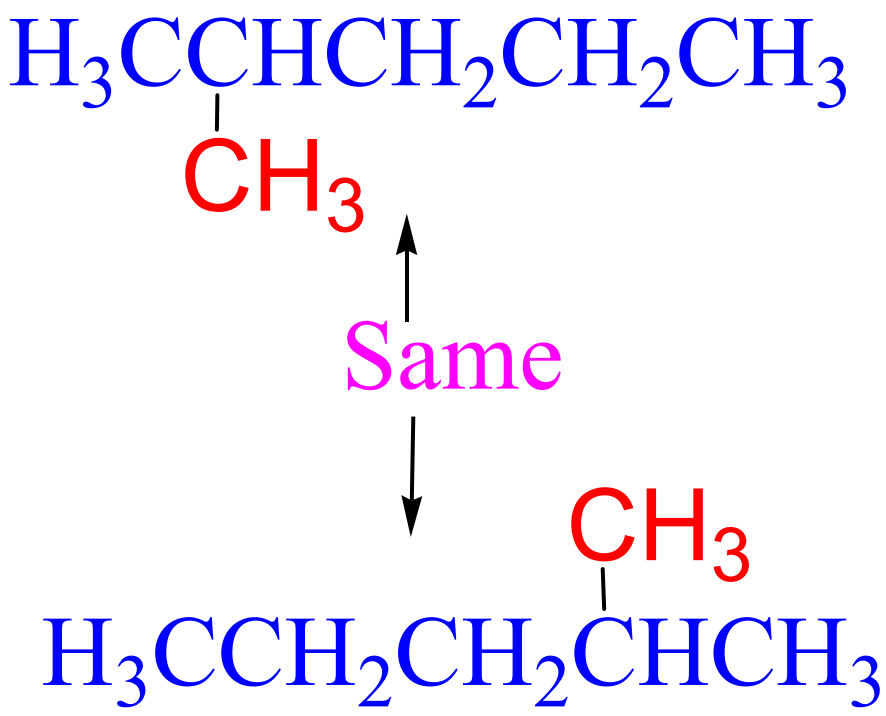



CH3
H3CCH2CH2CHCH3

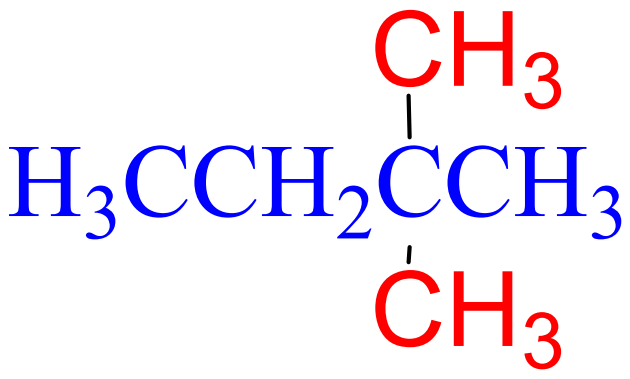

CH3
H3CCH2CHCH2CH3

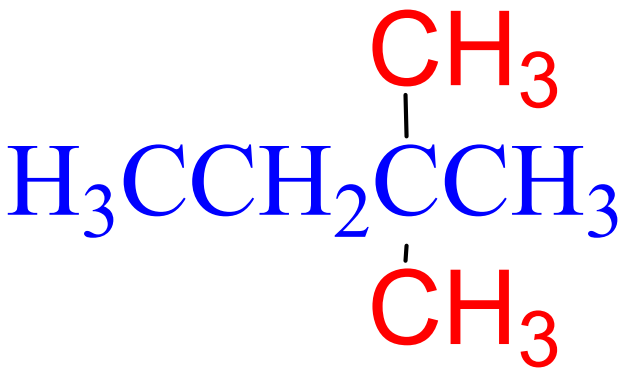


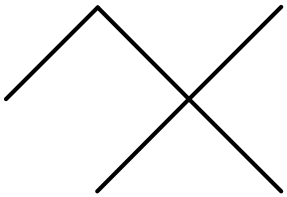

H3CCHCH2CH2CH3
CH3

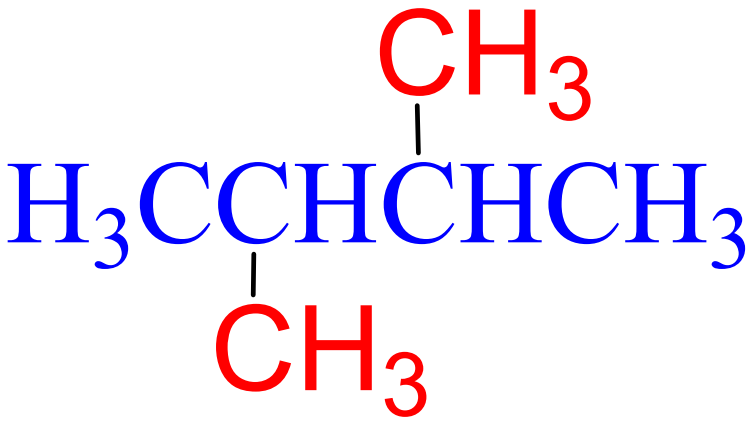

H3CCHCH2CH2CH3
CH3
Same
CH3
H3CCH2CH2CHCH3

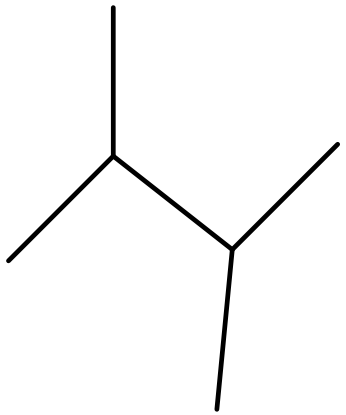

CH3
H3CCH2CH2CHCH3


CH3
H3CCH2CCH3
CH3

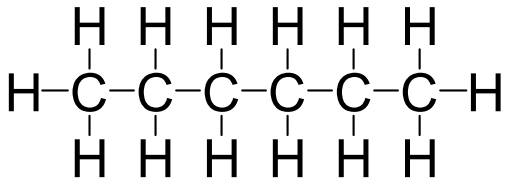

CH3
H3CCH2CCH3
CH3




CH3
H3CCHCHCH3
CH3

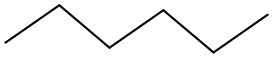


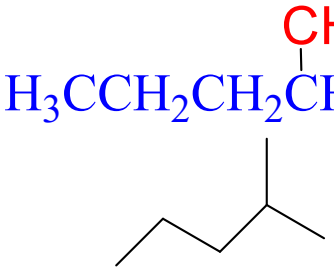
C_6H_{14}



Condensed

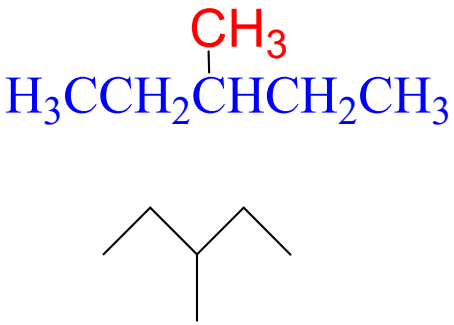
$H_3CCH_2CH_2CH_2CH_2CH_3$





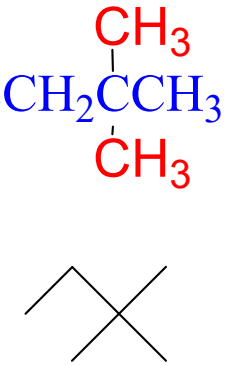
$H_3CCH_2CH_2CHCH_3$

CH_3



$H_3CCH_2CHCH_2CH_3$

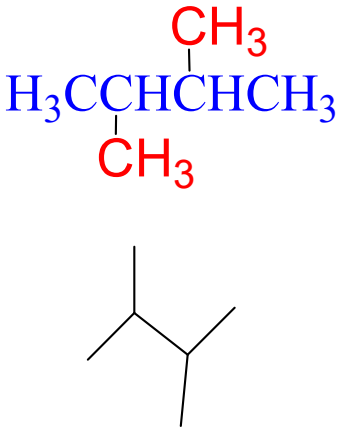
CH_3



$H_3CCH_2CCH_3$

CH_3

CH_3



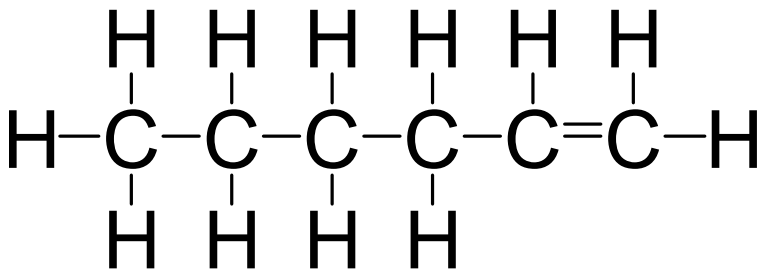
$H_3CCHCHCH_3$

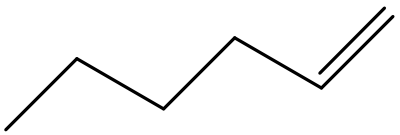
CH_3

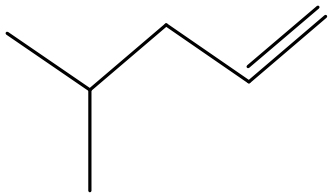
CH_3

C_6H_{12}

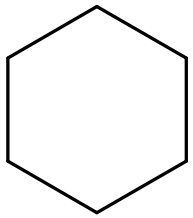
Acyclic



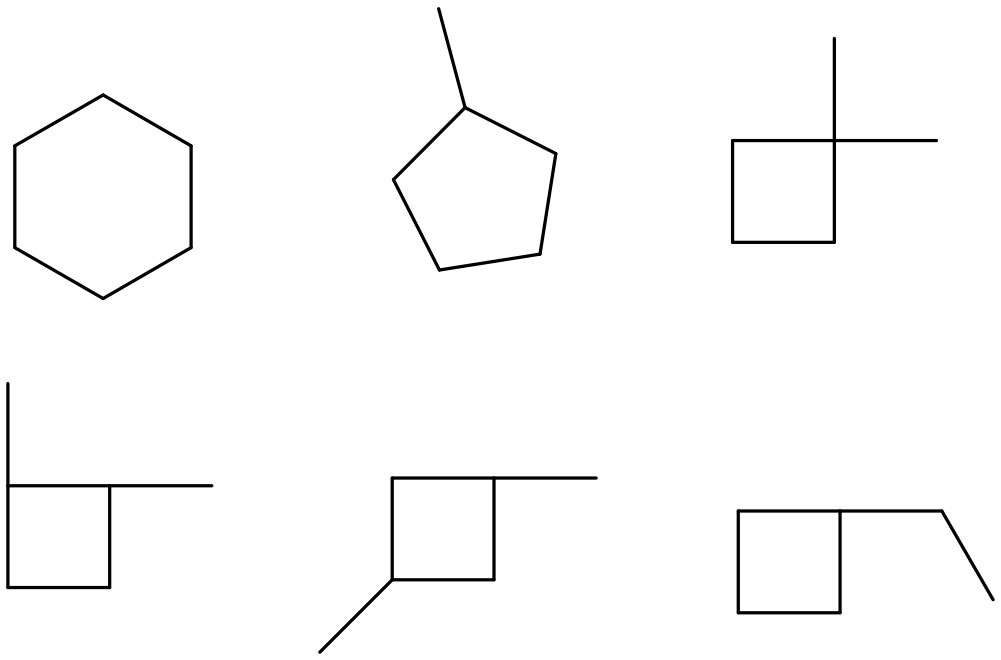




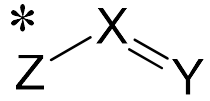
Cyclic



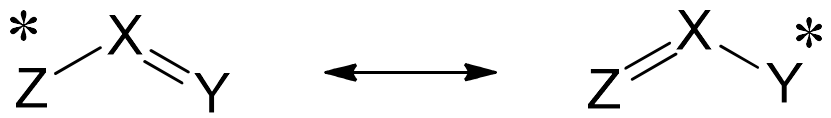
Cyclic



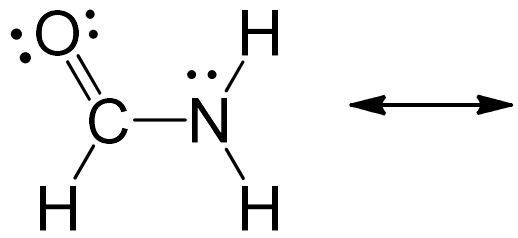
Resonance: general case

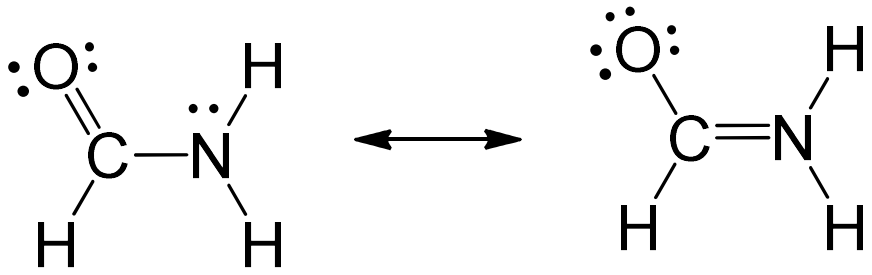


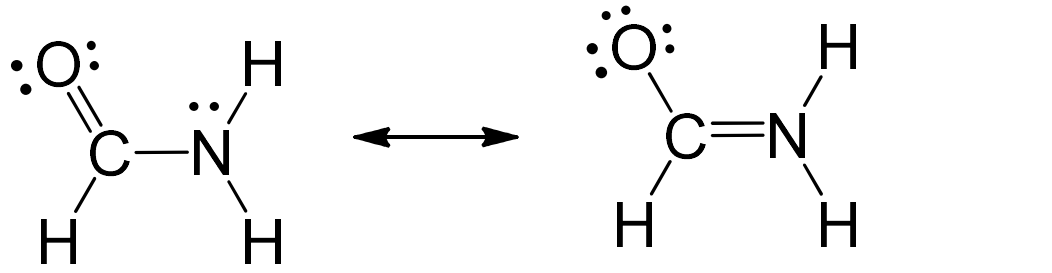
* : Lone pair
Charge (+ve Or -ve)



* : Lone pair
Charge (+ve Or -ve)

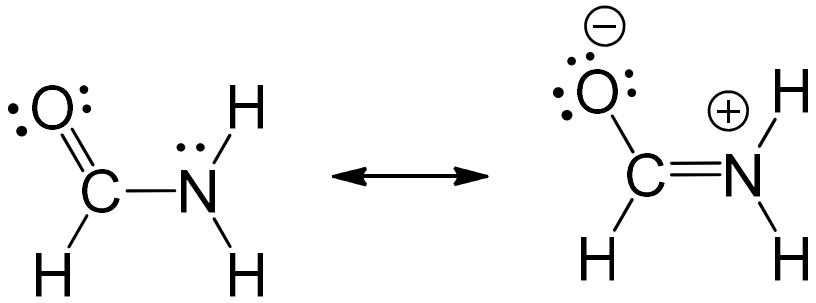

O
H
C
N
H
H

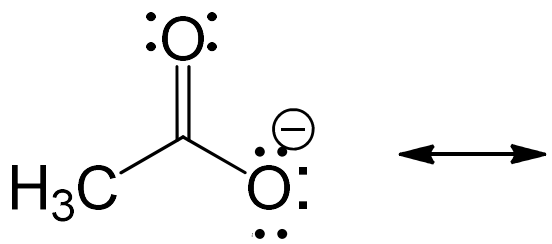

O
H
C
N
H
H
O
H
C
N
H
H

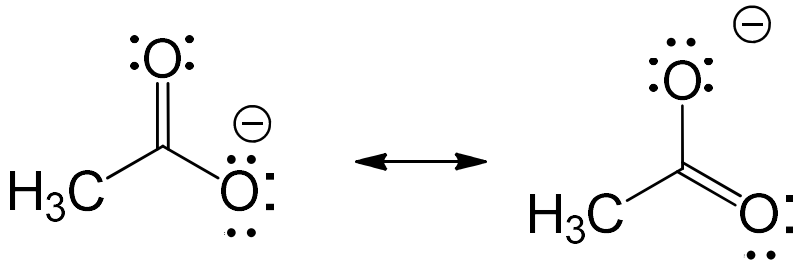


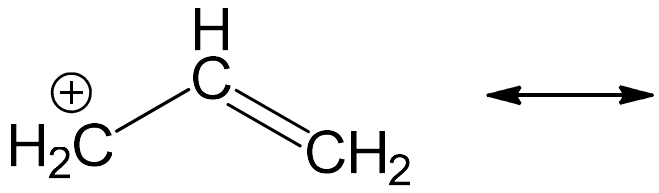
N: 5- 2-(6/2) = 0
O: 6- 4-(4/2) = 0

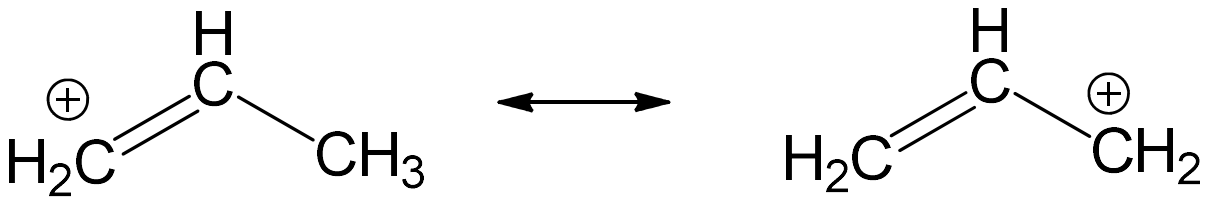
N: 5- 0-(8/2) = +1
O: 6- 6-(2/2) = -1

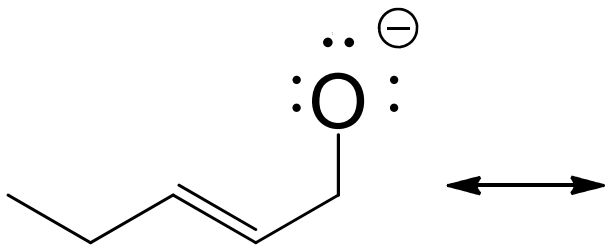

O
H
C
N
H
H
O
H
C
N
H
H

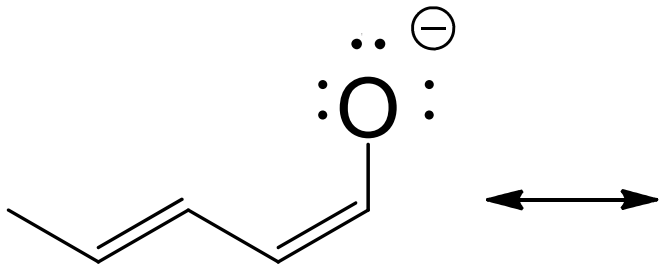

O
H3C
O
−

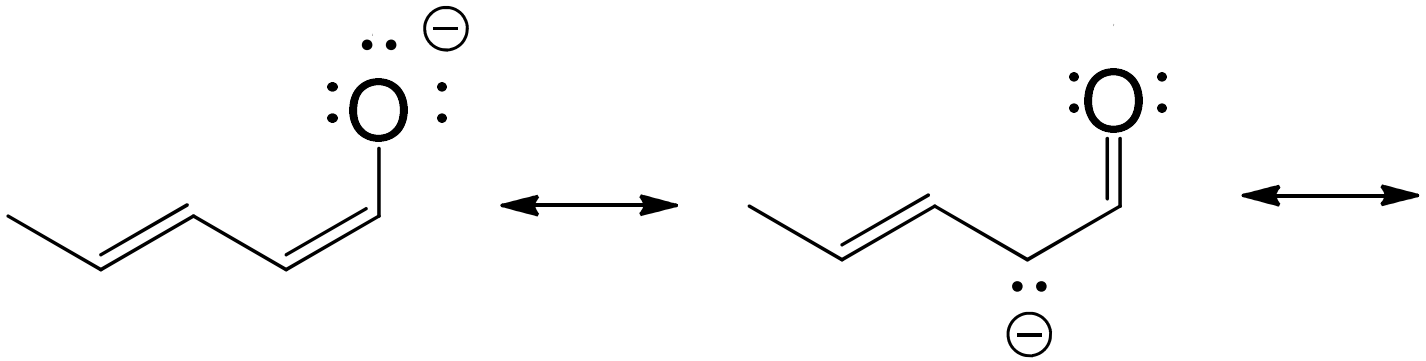

O
H3C
O
O
H3C
O

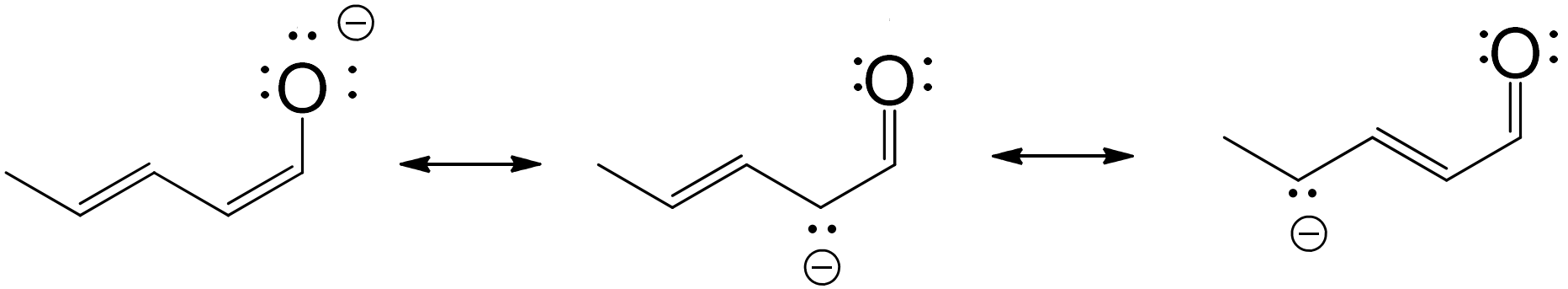

H
C
H2C
CH2

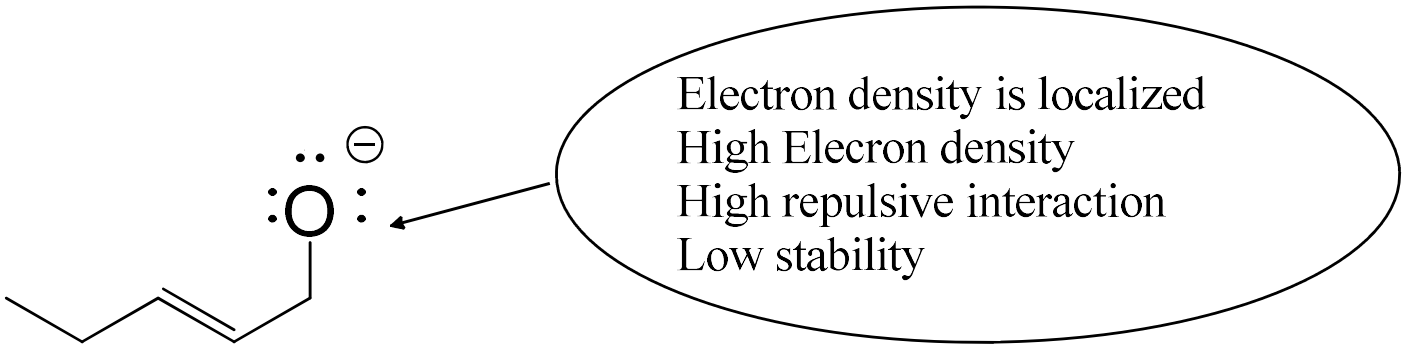

H
C
H2C
CH3
H
C
H2C
CH2

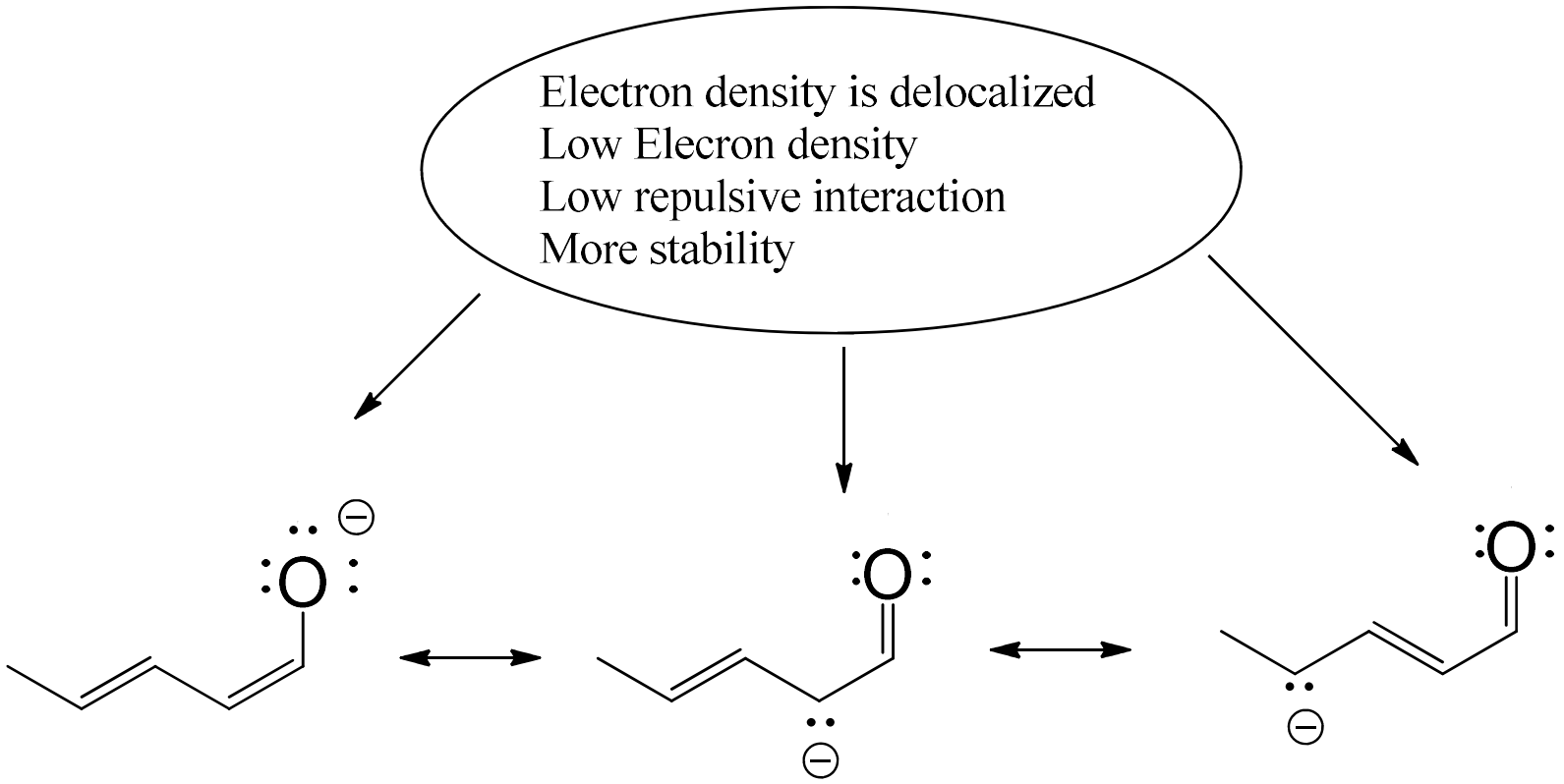






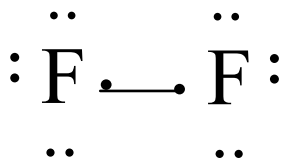



Electron density is localized
High Elecron density
High repulsive interaction
Low stability

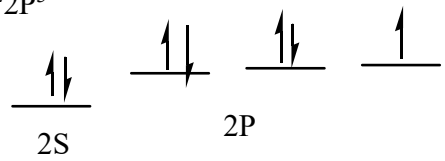

Electron density is delocalized
Low Elecron density
Low repulsive interaction
More stability

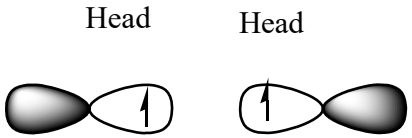
Valence bond theory

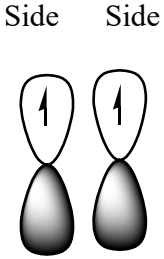
F_2

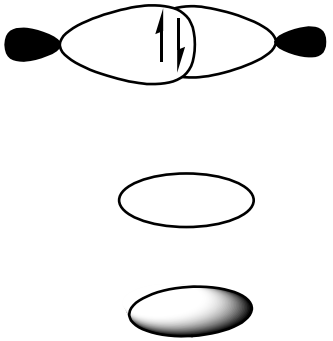


F $1S^2 2S^2 2P^5$

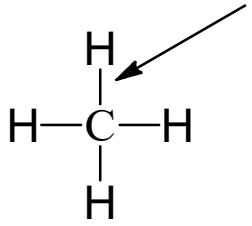


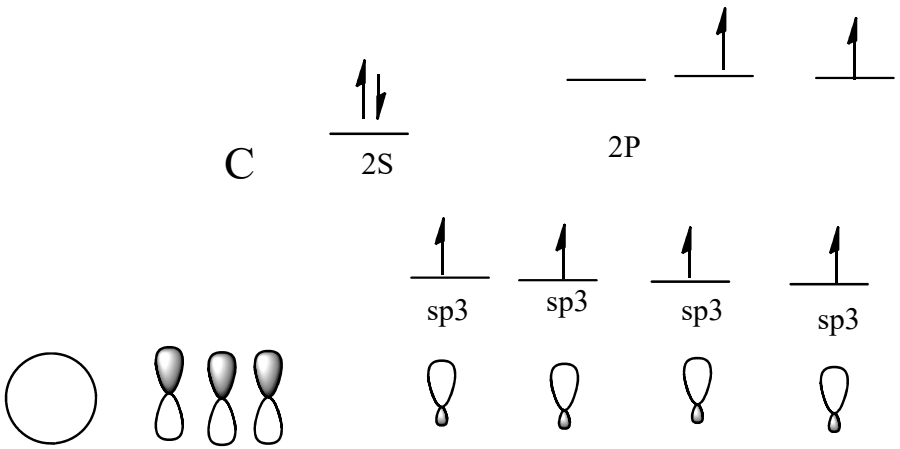


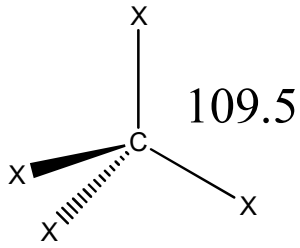


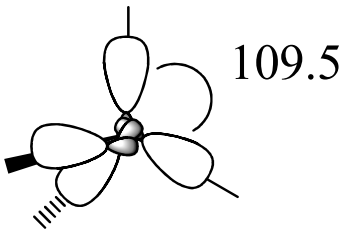


CH_4

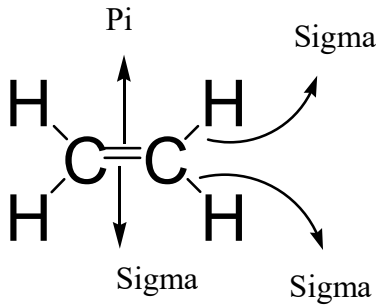


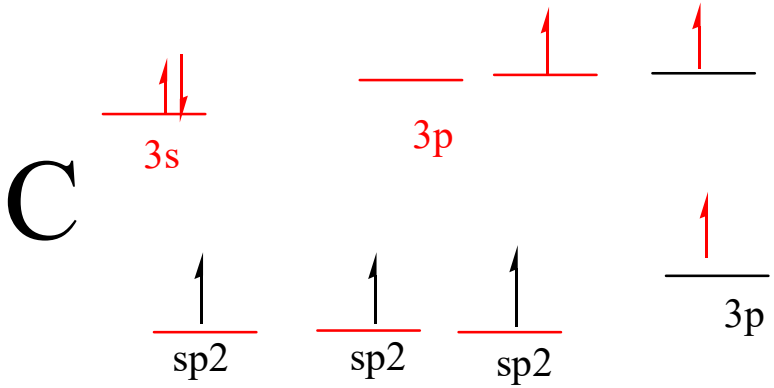


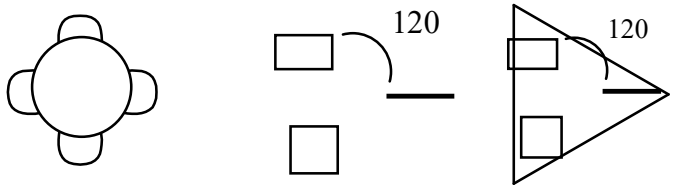




Tetrahedral

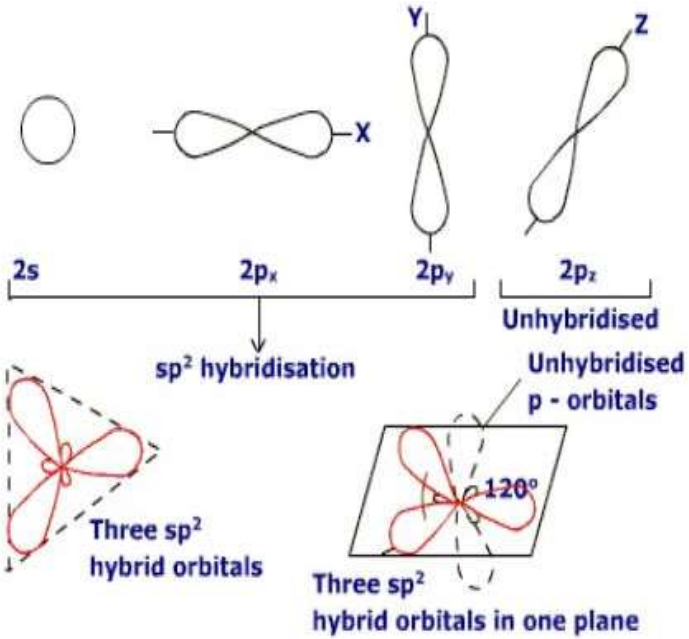




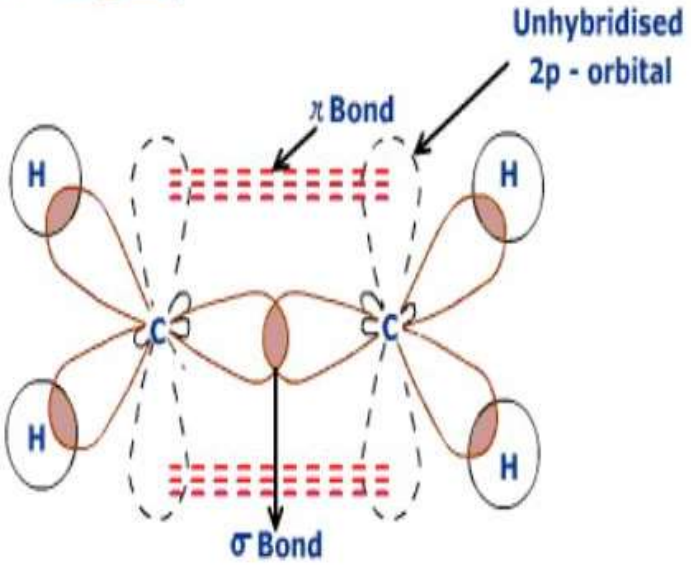


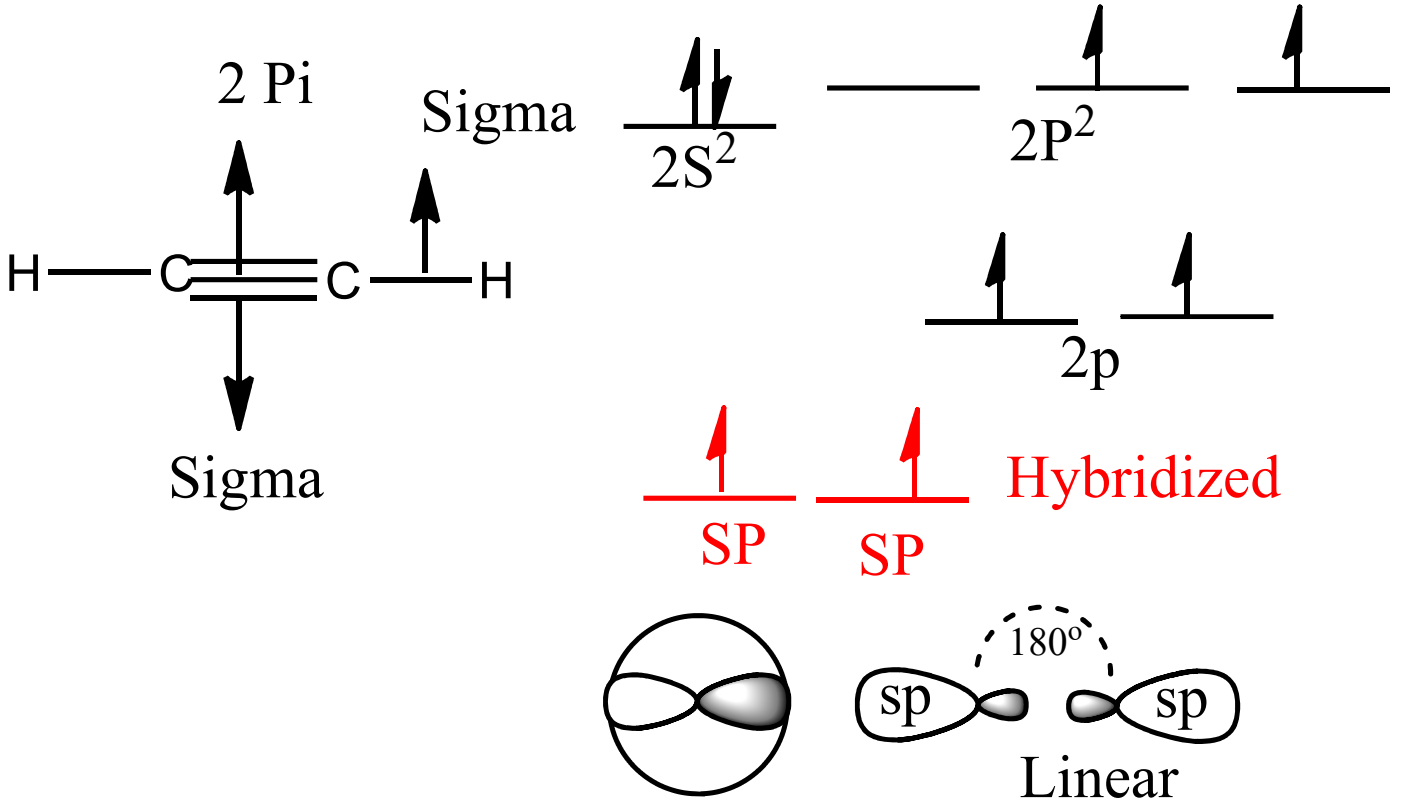
Trigonal planer

sp^2 Hybridization

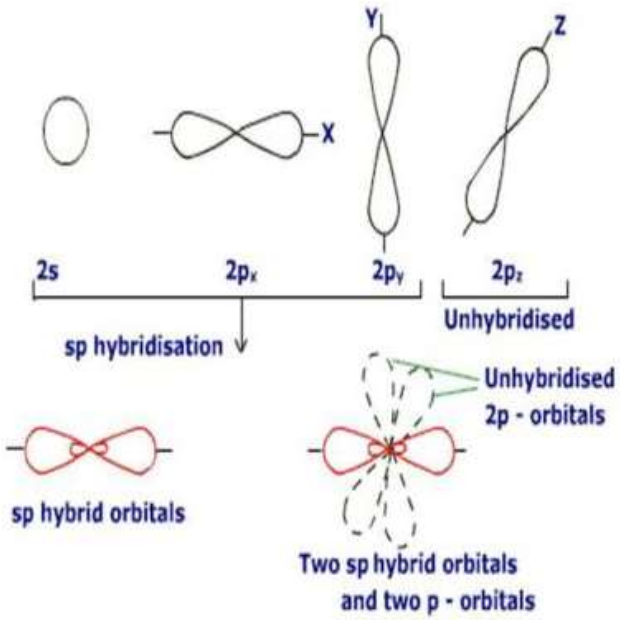


- C_2H_4

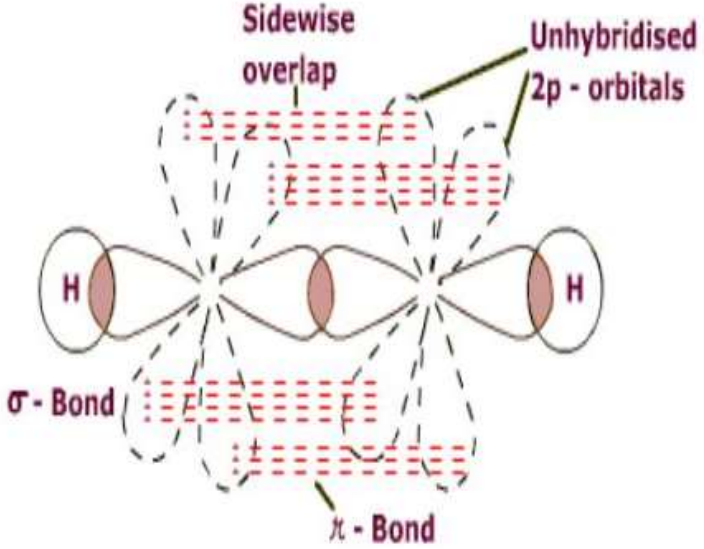



2 Pi
Sigma
H
C
C
H
Sigma
2S2
2P2
2p
SP
SP
Hybridized
180o
sp
sp
Linear

sp Hybridization



- C_2H_2



1.18 Classification According to Functional Group

Table 1.6 The Main Functional Groups

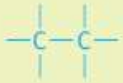
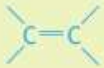
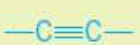
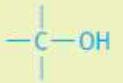
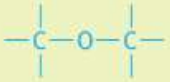
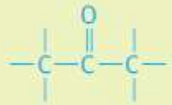
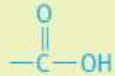
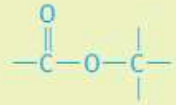
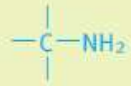
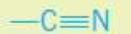
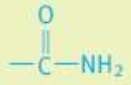
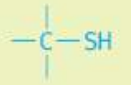
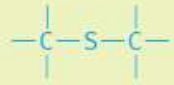
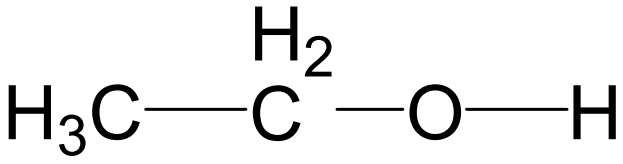
	Structure	Class of compound	Specific example	Common name of the specific example
A. Functional groups that are a part of the molecular framework		alkane	$CH_3—CH_3$	ethane, a component of natural gas
		alkene	$CH_2=CH_2$	ethylene, used to make polyethylene
		alkyne	$HC\equiv CH$	acetylene, used in welding
		arene		benzene, raw material for polystyrene and phenol
B. Functional groups containing oxygen				
1. With carbon–oxygen single bonds		alcohol	CH_3CH_2OH	ethyl alcohol, found in beer, wines, and liquors
		ether	$CH_3CH_2OCH_2CH_3$	diethyl ether, once a common anesthetic

Table 1.6 continued

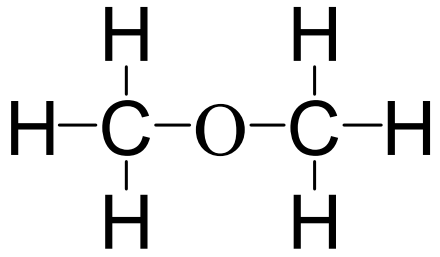
	Structure	Class of compound	Specific example	Common name of the specific example
*2. With carbon–oxygen double bonds**		aldehyde	$CH_2{=}O$	formaldehyde, used to preserve biological specimens
		ketone	CH_3CCH_3 (O)	acetone, a solvent for varnish and rubber cement
3. With single and double carbon–oxygen bonds		carboxylic acid	$CH_3C{-}OH$ (O)	acetic acid, a component of vinegar
		ester	$CH_3C{-}OCH_2CH_3$ (O)	ethyl acetate, a solvent for nail polish and model airplane glue

*C. Functional groups containing nitrogen****		primary amine	$CH_3CH_2NH_2$	ethylamine, smells like ammonia
		nitrile	$CH_2{=}CH{-}C{\equiv}N$	acrylonitrile, raw material for making Orlon
D. Functional group with oxygen and nitrogen		primary amide		formamide, a softener for paper
E. Functional group with halogen		alkyl or aryl halide	CH_3Cl	methyl chloride, refrigerant and local anesthetic
F. Functional groups containing sulfur†		thiol (also called mercaptan)	CH_3SH	methanethiol, has the odor of rotten cabbage
		thioether (also called sulfide)	$(CH_2{=}CHCH_2)_2S$	diallyl sulfide, has the odor of garlic



C_2H_6O
Mol. Wt.: 46.06844

Isomers

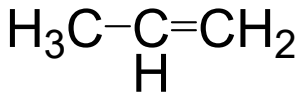


C_2H_6O
Mol. Wt.: 46.06844

C_3H_6

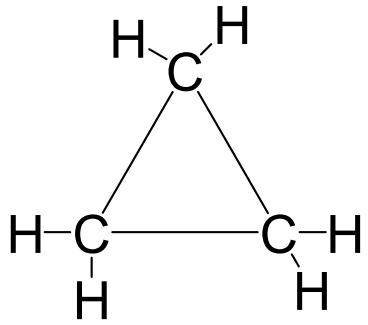
The maximamm number of H atoms that the compound can have = 2 X n+2

Each pair of hydrogen atoms less that the maximamm hydrogen atoms that the compund can have = a double bond or a cycle



C_3H_6

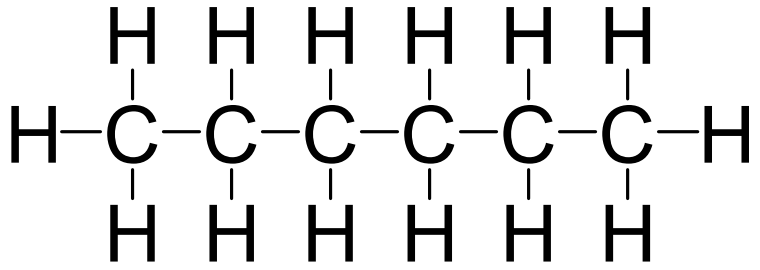
Acyclic



C_3H_6

Cyclic

C_6H_{14}

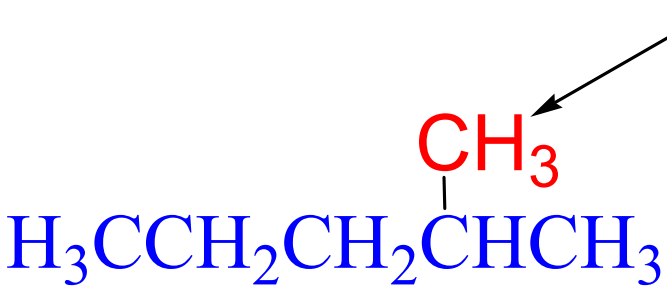


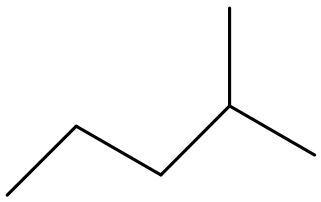
$H_3CCH_2CH_2CH_2CH_2CH_3$ Condensed

Sckeletal

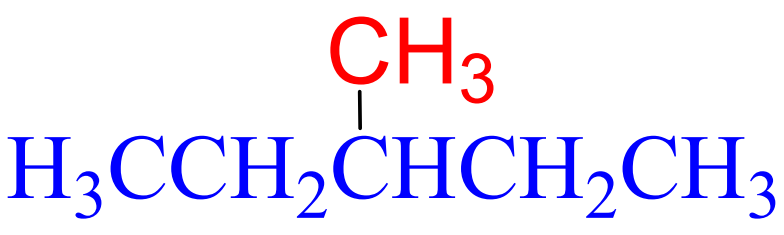
Branched

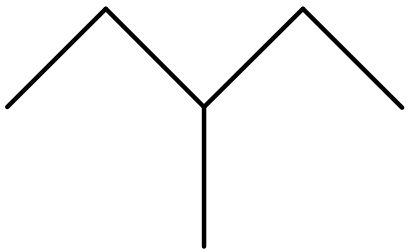
Substitution



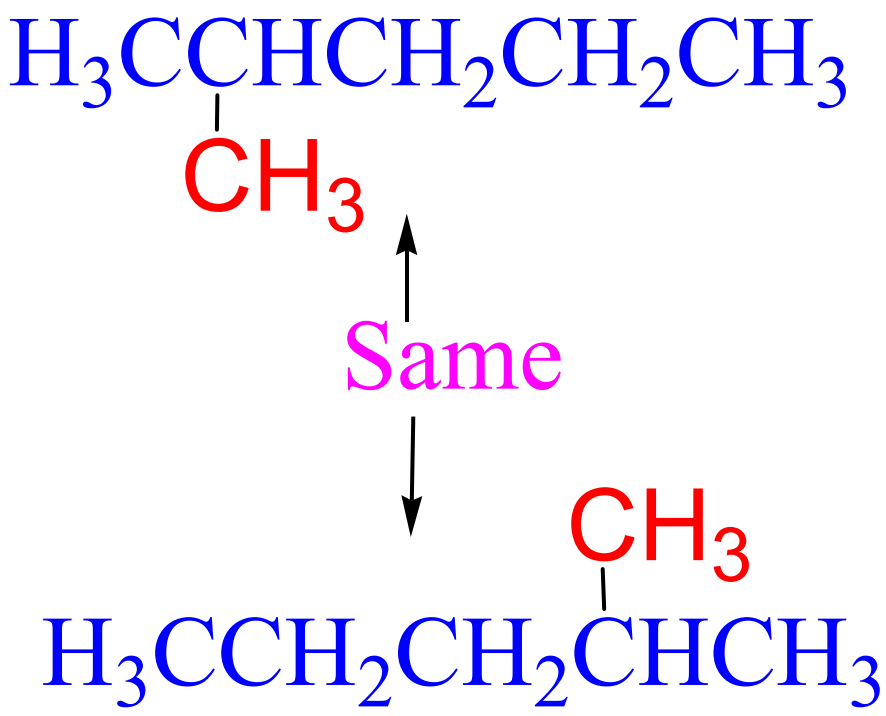



CH3
H3CCH2CH2CHCH3

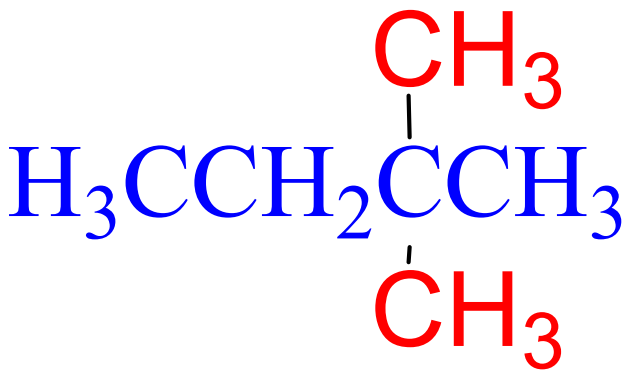

CH3
H3CCH2CHCH2CH3

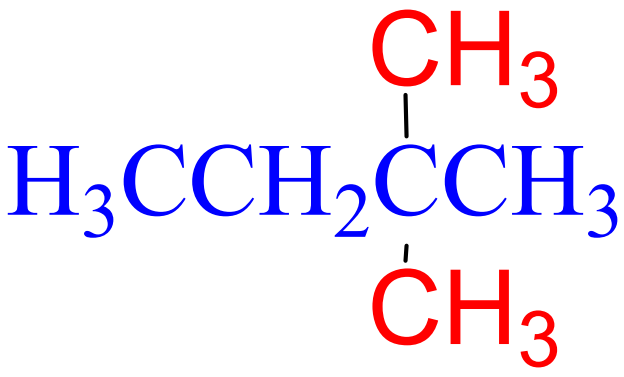


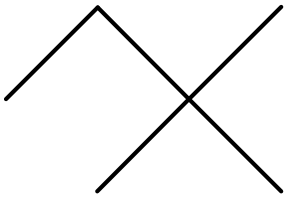

H3CCHCH2CH2CH3
CH3

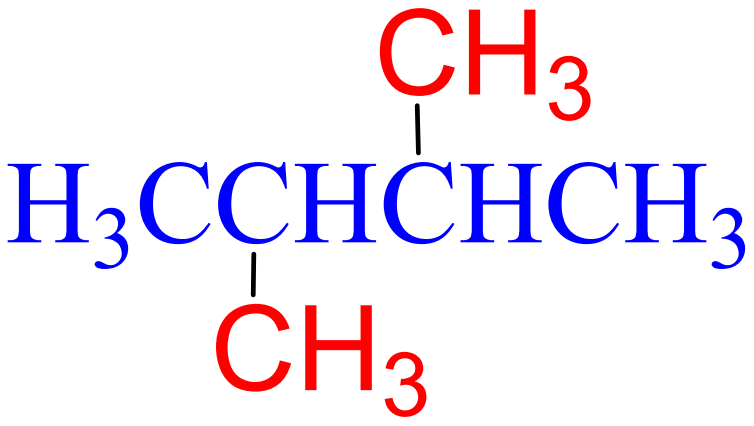

H3CCHCH2CH2CH3
CH3
Same
CH3
H3CCH2CH2CHCH3

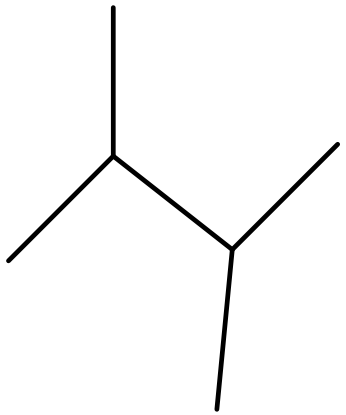

CH3
H3CCH2CH2CHCH3


CH3
H3CCH2CCH3
CH3

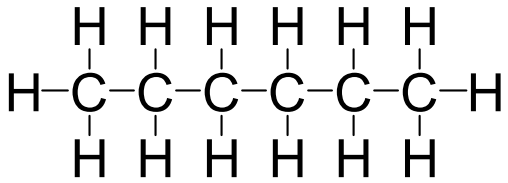

CH3
H3CCH2CCH3
CH3




CH3
H3CCHCHCH3
CH3

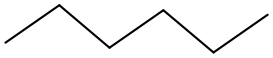


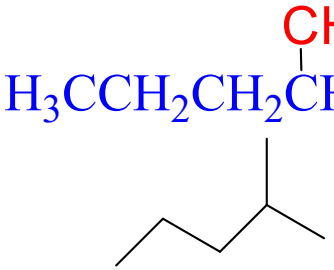
C_6H_{14}



Condensed

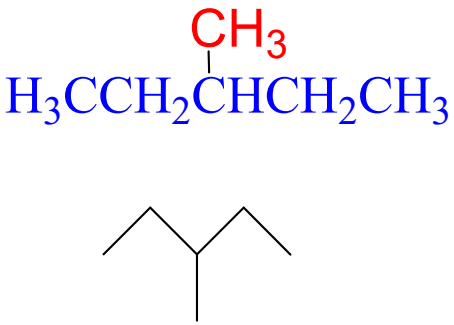
$H_3CCH_2CH_2CH_2CH_2CH_3$





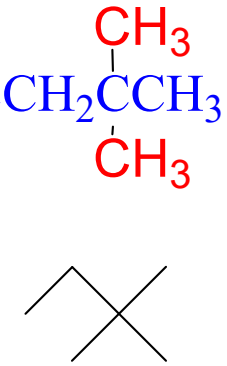
$H_3CCH_2CH_2CHCH_3$

CH_3



$H_3CCH_2CHCH_2CH_3$

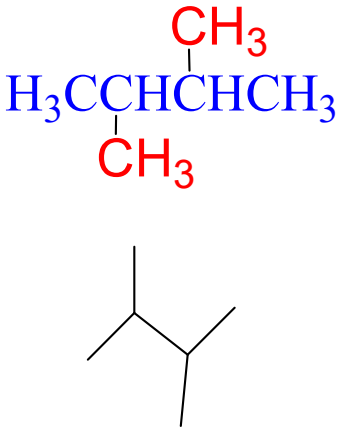
CH_3



$H_3CCH_2CCH_3$

CH_3

CH_3



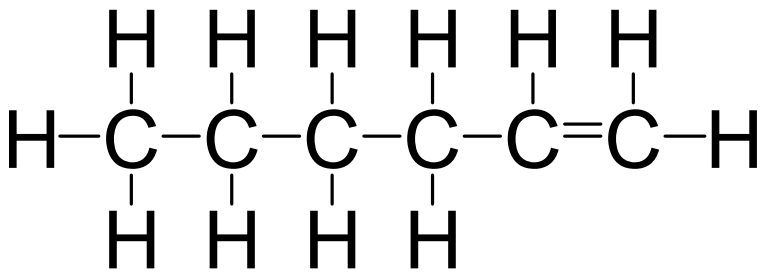
$H_3CCHCHCH_3$

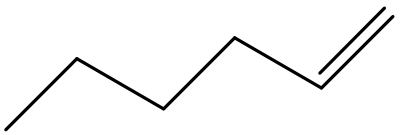
CH_3

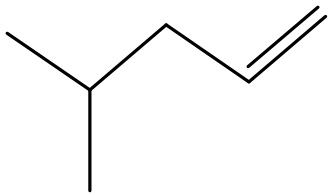
CH_3

C_6H_{12}

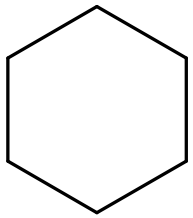
Acyclic







Cyclic



Cyclic