

22

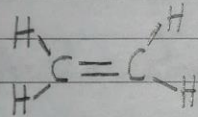
د. محمد علي، محاضرة
 أول علوم - رتبة Biotechnology - كاتبة
 ولاء تربية خاصة / علوم.

نقاط مختلفة ومبسطة:

1. Alkenes (Unsaturated Hydrocarbons):

The carbon-carbon double bond is the distinguishing feature of the alkene structure.

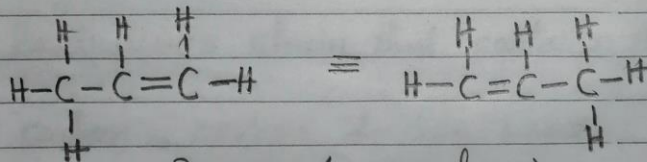
The simplest (smallest) member of the alkene family is ethene (ethylene), C_2H_4 .



sp^2 hybridization,
flat molecule

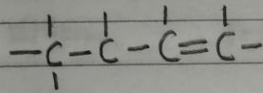
Ethene (ethylene)

The next (second) member of the alkene family is propene (propylene), C_3H_6 .



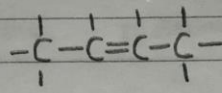
Propene (propylene)

Butene (butylene), C_4H_8



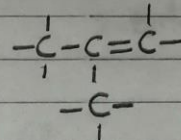
1-Butene

A



2-Butene

B



Isobutylene

2-Methyl-1-butene

C

A, B & C, each of them has the same

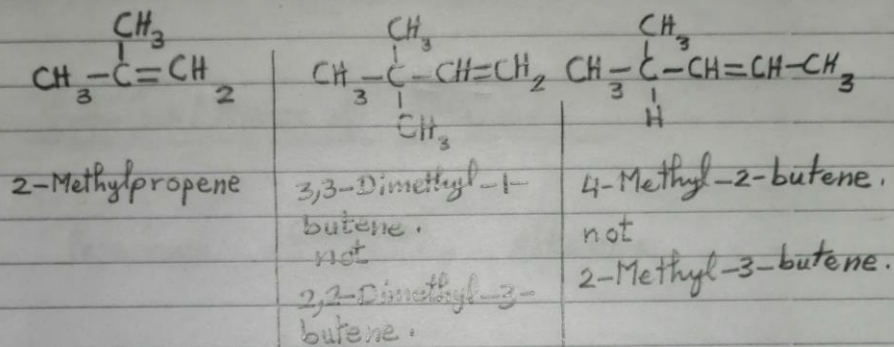
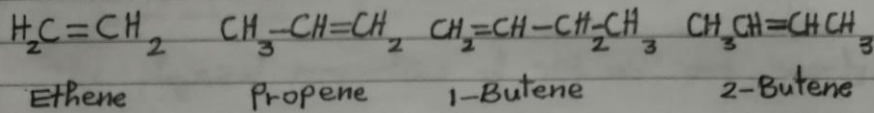
molecular formula, C_4H_8 , and different

molecular structure, i.e., A, B & C are isomers

, one to each other.

2. IUPAC names:

- 2.1. Select as the parent structure the longest continuous chain that contains the carbon-carbon double bond.



2.2. The double bond takes the least number.

2.3. The functional group (attaching to the parent chain) takes the least number.

2.4.

{ Alkane: Methane Ethane Propane
 { Alkene: — Ethene Propene

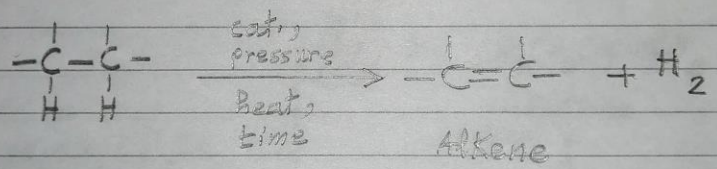
{ Alkane: Butane Pentane, ...
 { Alkene: Butene Pentene, ...

3. Physical Properties of Alkenes ;

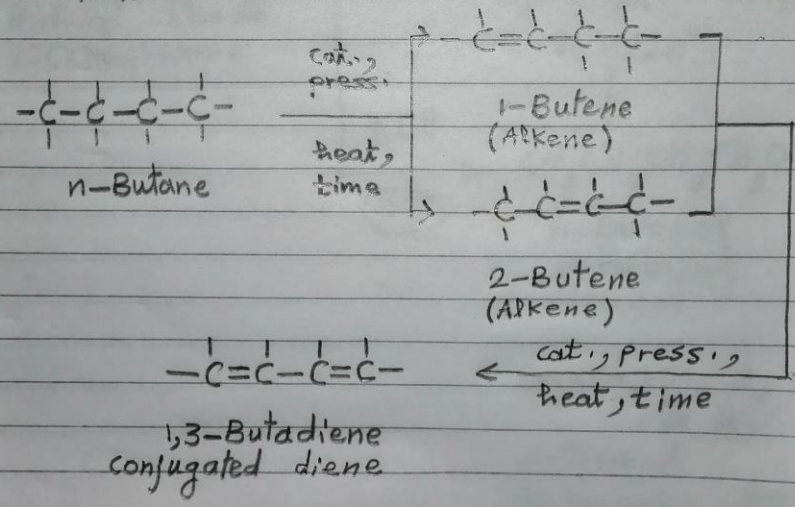
The physical properties of alkenes are nearly the same as those of the alkanes .

4. Industrial Source of Alkenes :

Petroleum $\xrightarrow{\text{Cracking}}$ Alkenes

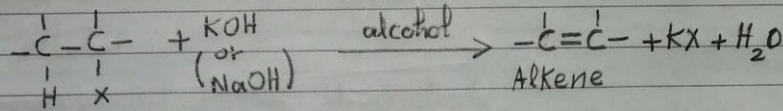


Alkane



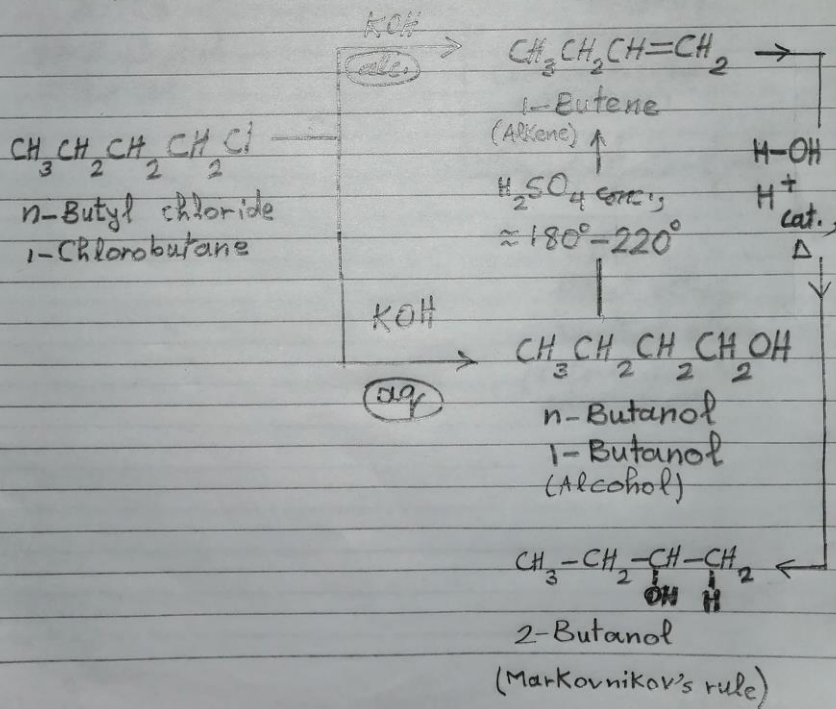
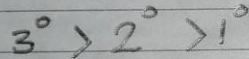
5. Preparation of Alkenes:

5.1. Dehydrohalogenation of Alkyl halides:

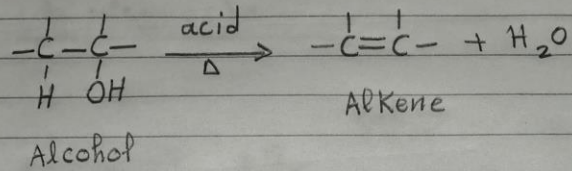


Alkyl halide

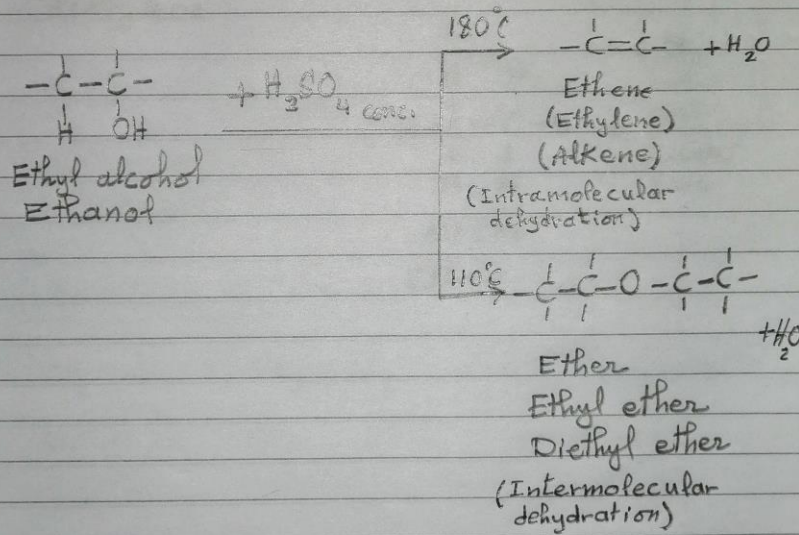
Ease of dehydrohalogenation of alkyl halides:



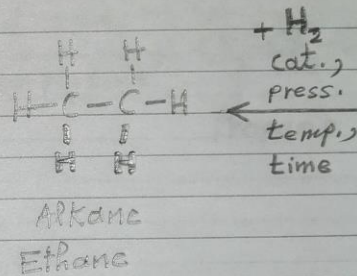
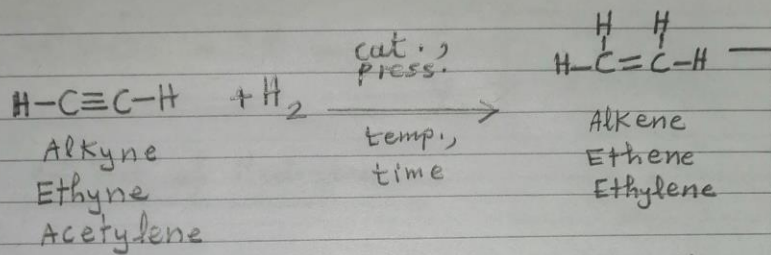
5.2. Dehydration of Alcohols:



Ease of dehydration of alcohols:
 $3^\circ > 2^\circ > 1^\circ$

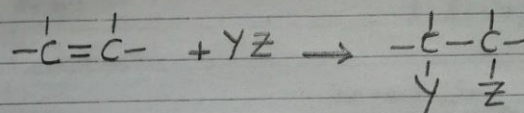


5.3. Reduction of Alkynes; (Addition of Hydrogen to alkynes):

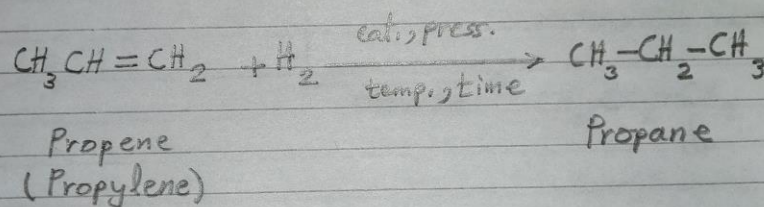


6. Reactions of Alkenes :

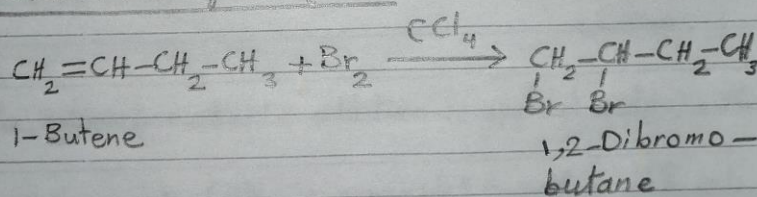
Addition Reactions ;



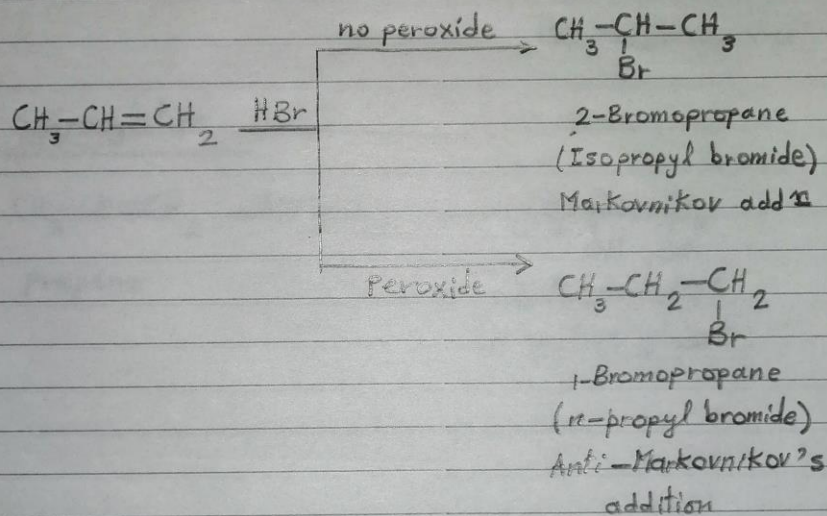
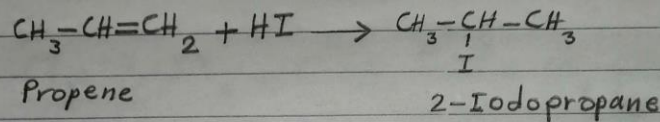
6.1. Addition of Hydrogen :



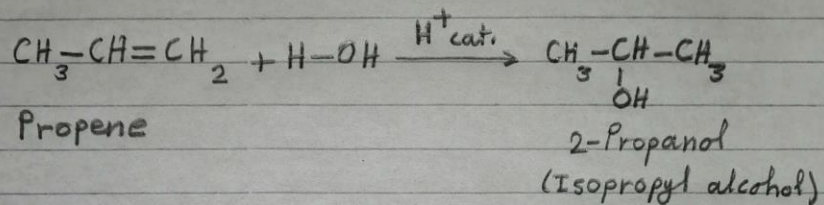
6.2. Addition of Halogen :



6.3. Addition of Hydrogen halide (HX, x = Cl, Br, I) :-



The antimarkovnikov's addition is applied only in the presence of (HBr + peroxide) together. If only one of them is present, the Markovnikov's addition is applied as given in the above mentioned examples.

6.4. Addition of Water: Hydration (H-OH) :-6.5. Hydroxylation: