

## UNIT 13

## HYDROCARBONS

Answer the questions. ( 1 Score each)

1. From the following, select the one in which Markovnikov's rule is best applicable.

- i)  $C_2H_4 + HCl$     ii)  $C_3H_6 + Br_2$     iii)  $C_3H_6 + HBr$     iv)  $C_3H_8 + Cl_2$

Ans: iii)  $C_3H_6 + HBr$

2. Free rotation is possible with respect to a C – C bond in the case of alkanes. The repulsive interaction between the adjacent bonds in a conformation is called .....

Ans: a) Torsional strain

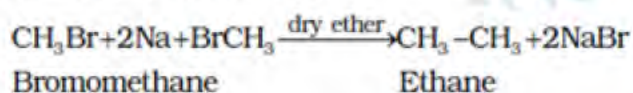
3. In a special condition, addition of HBr to unsymmetrical alkene takes place contrary to Markovnikov's rule. a) What is the special condition?

Ans. The special condition is the presence of organic peroxide.

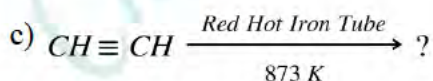
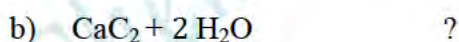
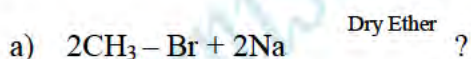
Answer the questions. ( 2 Score each)

4. What is Wurtz reaction? Give an example.

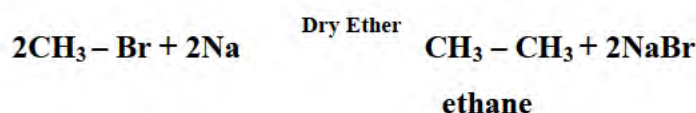
Ans: Alkyl halides react with metallic sodium in dry ether to form alkanes. This reaction is known as Wurtz reaction

Answer the questions. ( 3 Score each)

5. Complete the following reactions



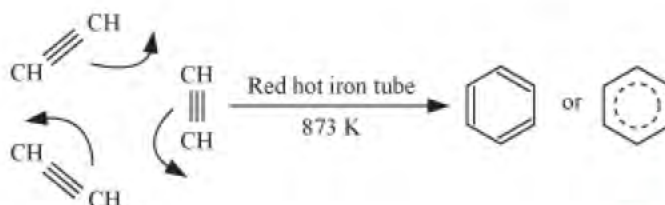
Ans: a) Bromomethane react with metallic sodium in dry ether producing ethane (Wurtz reaction)



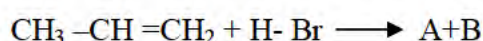


Calcium carbide react with water producing acetylene gas.

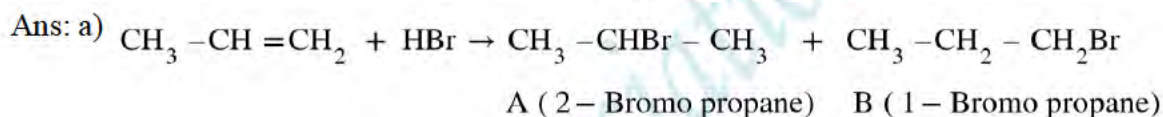
c) **Cyclic Polymerisation: Ethyne molecule on passing through red hot iron tube at 873K give benzene.**



6. Analyse the following reaction



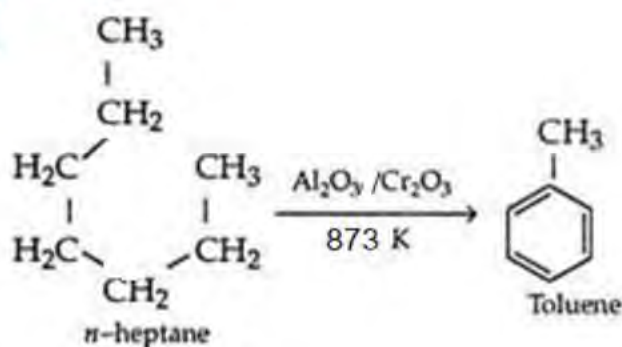
- Identify the product A and B
- Also name the related Rule. Which is the major product here?



b) Major product is 2- Bromo propane. Rule is Markovinkov's Rule.

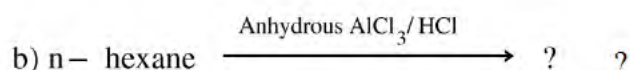
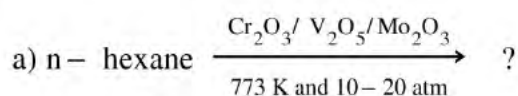
7. Suggest alkane for the preparation of Toluene by aromatization, Write equation for this aromatization?

Ans: n- heptane



(Methyl benzene)

8. Write the product of the following reaction

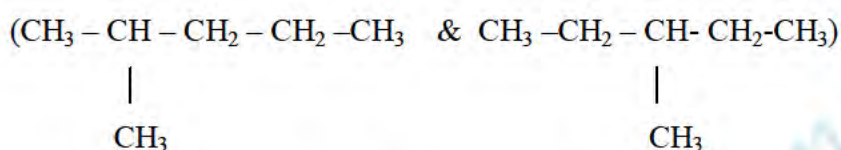


c) Name the above reactions.

Ans: a) Benzene or



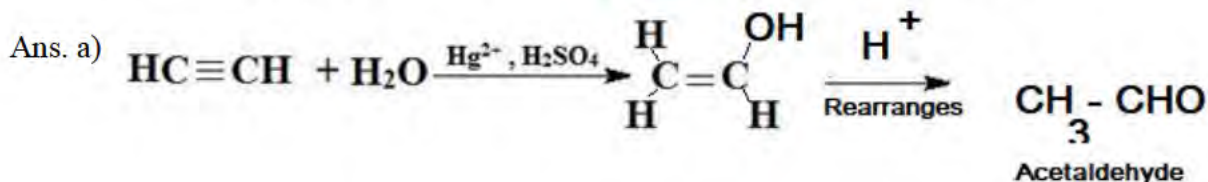
b) 2-methyl pentane + 3-methyl pentane



c) a)- Aromatisation b)- Isomerization

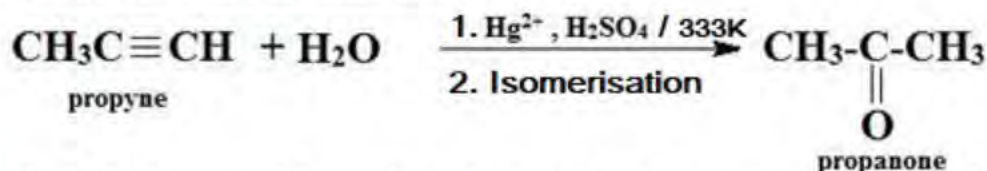
9. Convert a) Ethyne to ethanal

b) Propyne to Propanone



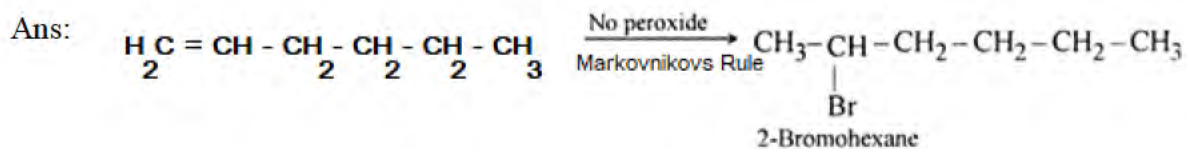
b. Addition of water (hydration)

**Conversion of propyne to propanone**

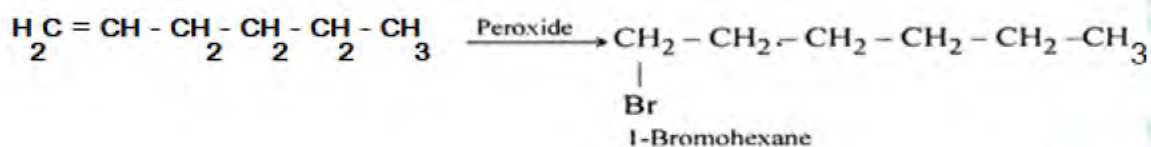


10. Write the IUPAC names of the products obtained by addition reaction of HBr to hex-1-ene with the statement of related rules

1. In the absence of Peroxide
2. In the presence of peroxide



Rule: When an unsymmetrical reagent adds across unsymmetric alkene negative part of the reagent goes to carbon atom containing less number of hydrogen – Markovnikov's rule

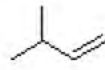
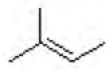
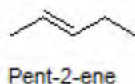
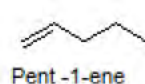


Rule: Peroxide Effect

When an unsymmetric reagent adds across unsymmetric alkene in the presence of peroxide addition occurs against Markovinkov's Rule. That is negative part of the reagent goes to carbon atom containing more number of hydrogen atom.

11. Write structures and IUPAC names of different structural isomers of alkenes corresponding to  $\text{C}_5\text{H}_{10}$

Ans:



OR

