

SHORT QUESTIONS

Q.1 Why there is no free rotation around a double and a free rotation around a single bond?

Ans. In case of alkane only sigma bonds are present. In case of alkene two type of bonds are present; sigma and Pi bond. Due to parallel overlapping of p-orbitals in Pi-bond, no free rotation is present. So these double bonds are called restricted bonds. Due to restriction of rotation in alkenes, they have geometrical isomerism (Cis and trans isomerism).

Q.2 How tetraethyl lead acts as knock inhibitor in gasoline?

Ans. Tetraethyl lead acts as negative catalyst and it reduces the speed of combustion of the fuel, hence less knocking is produced.

Q.3 Why members of chain isomers of pentane are greater than butane?

Ans. As the number of carbon atom increase, number of possible arrangement also increases. Butane has two chain isomers while pentane has three isomers.

Q.4 Concept of metamerism is not present in butanone, why?

Ans. In metamerism, alkyl group varies on both side of functional group. In 2-butanone two alkyl groups are present on both side of carbonyl carbon.



Methyl ethyl ketone or 2-butanone

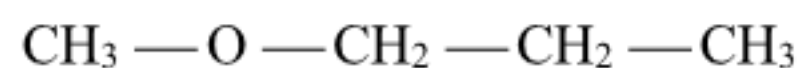
By rearranging the alkyl groups, name of ketone remains same.

Q.5 Ethers show metamerism and functional group isomerism. Explain it.

Ans. Ethers show functional group isomerism with alcohol. $\text{C}_2\text{H}_5\text{OH}$ and CH_3OCH_3 both are functional group isomers. Diethyl ether and higher ethers show metamerism in which alkyl groups are different on both side of functional group.



Diethyl ether



Methyl n-propyl ether

Q.6 Cracking process is used to increase the yield of gasoline, explain it.

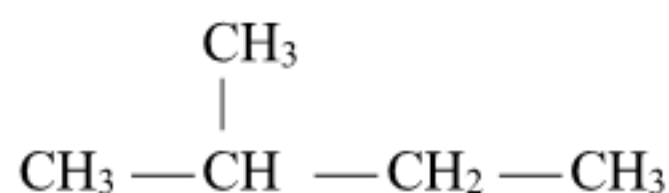
Ans. Fractional distillation of petroleum yields only 20% gasoline. Due to its greater demand, deficiency of gasoline is recovered by converting higher hydrocarbon to gasoline by cracking process. In this way, yield of gasoline is increased by cracking.

Q.7 Give possible isomers of C_5H_{12} .

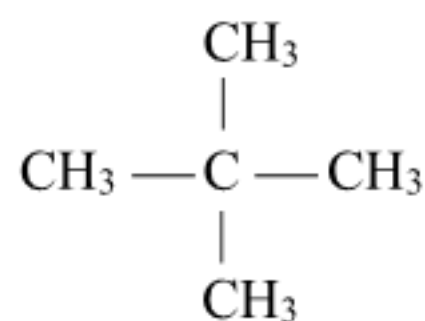
Ans. C_5H_{12} has three isomers.



n-pentane



2 methyl butane or iso-pentane



2, 2 dimethyl propane (Neopentane)

Q.8 On what basis different fractions of petroleum are separated from each other?

Ans. Different fractions of petroleum are separated from each other on the basis of their different boiling points.

Q.9 What is vital force theory?

Ans. Historically the term organic chemistry was applied to the study of those compounds, such as alcohols, sugar and urea that were found in living organism but were not found in non-living matter.

Therefore, for a longer time it was believed that organic compounds could be produced only in living organisms and there is some vital force present only in living organism necessary to generate organic compounds.

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