Chemistry Class 12 NCERT Solutions: Chapter 10 Haloalkanes and Haloarenes Part 6

Q: 10. Predict all the alkenes that would be formed by dehydrohalogenation of the following halides with sodium Ethoxide in ethanol and identify the major alkene:

(i) 1-Bromo-1-methylcyclohexane

(ii) 2-Chloro-2-methylbutane

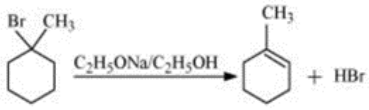
(iii) 2,2, 3-Trimethyl-3-bromopentane.

Answer:

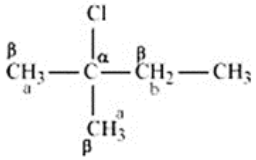
(i)

1 – bromo – 1 – methylcyclohexane

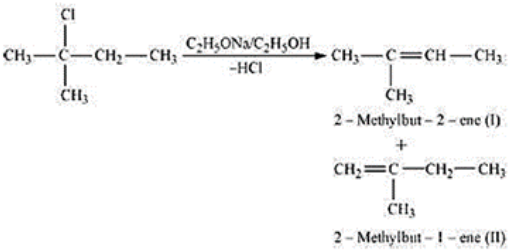
In the given compound, all β-hydrogen atoms are equivalent. Thus, dehydrohalogenation of this compound gives only one alkene.



(ii)



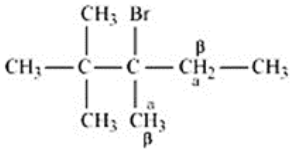
In the given compound, there are two different sets of equivalent β-hydrogen atoms labelled as a and b. Thus, dehydrohalogenation of the compound yields two alkenes.



Saytzeff's rule implies that in dehydrohalogenation reactions, the alkene having a greater number of alkyl groups attached to a doubly bonded carbon atoms is preferably produced.

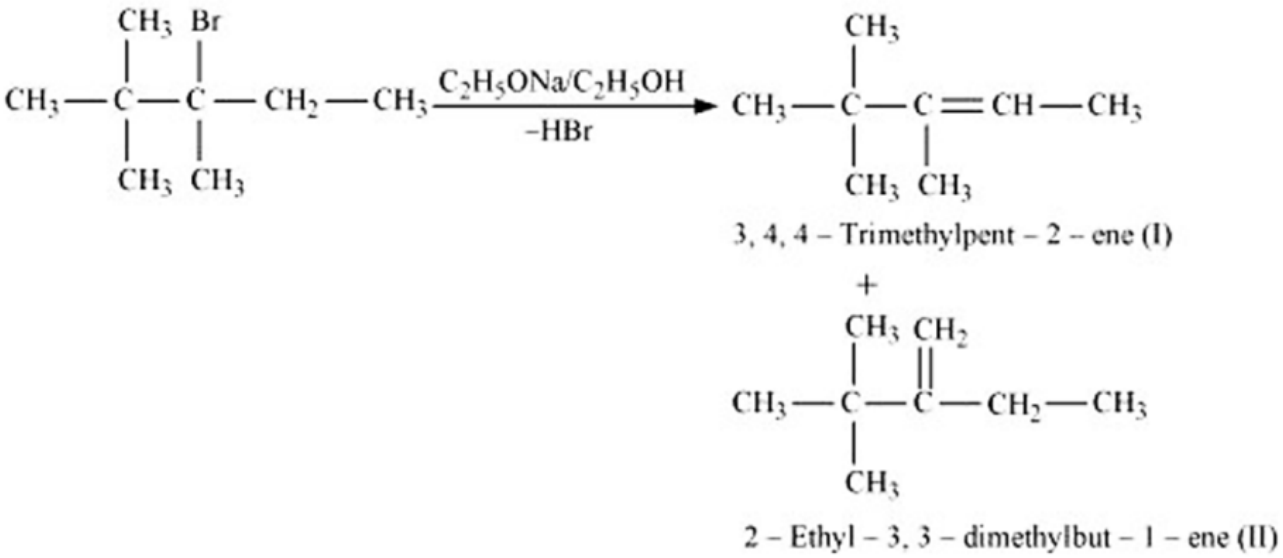
Therefore, alkene (I) i.e.. , 2-methylbut-2-ene is the major product in this reaction.

(iii)



2,2, 3-Trimethyl-3-bromopentane

In the given compound, there are two different sets of equivalent β- hydrogen atoms labelled as a and b. Thus, dehydrohalogenation of the compound yields two alkenes.



According to Saytzeff's rule, in dehydrohalogenation reactions, the alkene having a greater number of alkyl groups attached to the doubly bonded carbon atom is preferably formed.

Hence, alkene (I) i.e.. , 3,4, 4-trimethylpent-2-ene is the major product in this reaction.