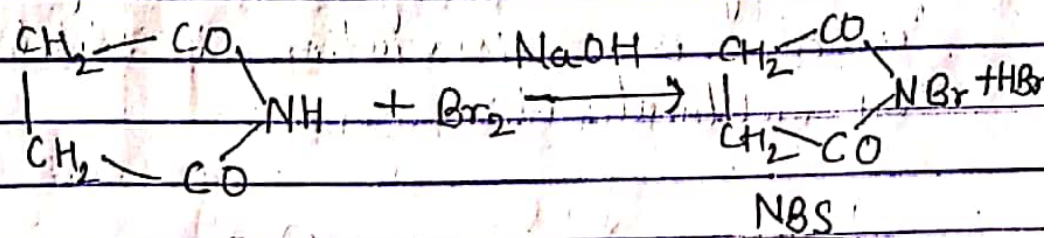


## Paper-VII

Topic: - N-Bromosuccinimide (NBS)

Preparation  $\rightarrow$  The reagent is prepared by gradually adding bromine to an ice-cold solution of succinimide in alkali. N-bromosuccinimide precipitate out immediately.

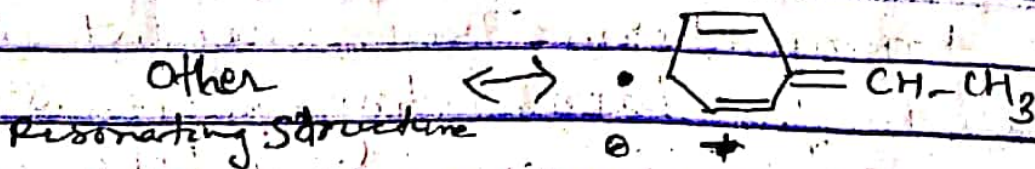
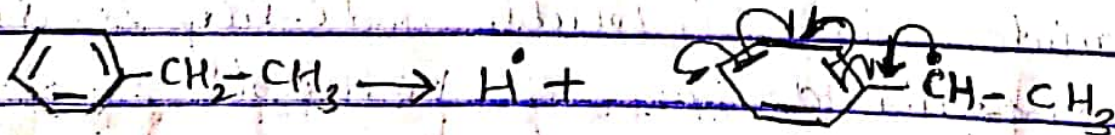
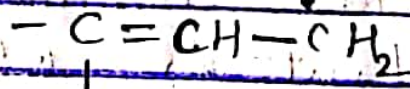
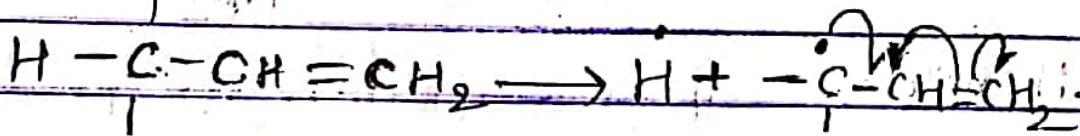


Succinimide -

Bromination in NBS is generally carried out in carbon tetrachloride ( $\text{CCl}_4$ ) as a solvent in which the liberated succinimide is insoluble and easily separated. N-bromosuccinimide is a valuable reagent for brominating specifically allylic and benzylic positions. Such reactions are called Wohl-Ziegler bromination. The reagent is also used for brominating positions  $\alpha$ -to the carbonyl group and triple bond, when both double bond and triple bonds are present in a compound, the preferred position of bromination is  $\alpha$ -to the triple bond. The reagent can be used to oxidise primary alcohols, secondary alcohols and primary amines.

## Specificity of allylic and benzylic positions.

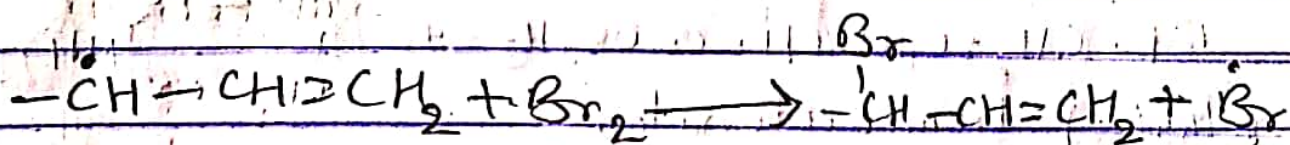
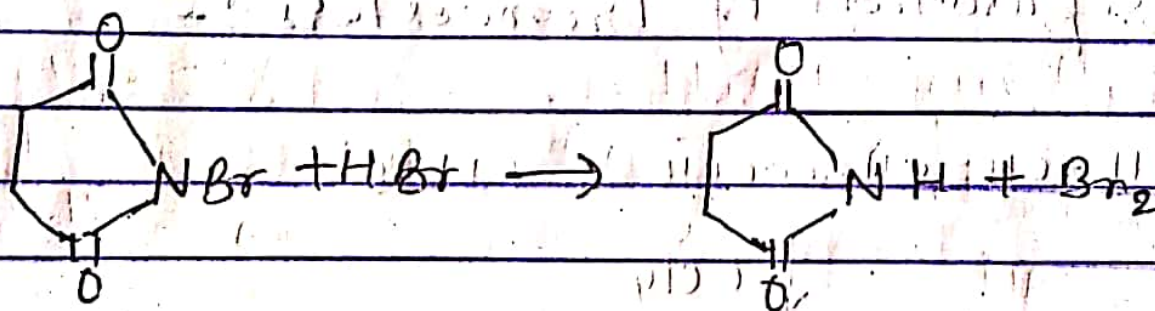
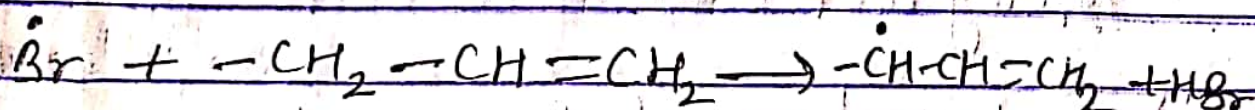
Allylic and benzylic hydrogens have a low bond dissociation energy, it is only 77 Kcal, while for vinylic and methane hydrogens it is 104-122 Kcal and 102 Kcal respectively. Also the allylic or benzylic radical (ion) formed on dissociation is stabilized by delocalization.



Hence the allylic and benzylic hydrogens are easily substituted by bromine from NBS.

## Mechanism

The reaction proceeds only in the presence of free radical initiators i.e., peroxide or UV light. Hence the reaction is a free radical reaction.



Function of NBS is to provide a slow, constant supply of a low concentration of bromine by reacting with HBr formed in the first step.