

P.GI.-II ORGANIC CHEMISTRY

Unit-I

Sharpless asymmetric epoxidation

(Sharpless & Katsuki Oxidation)

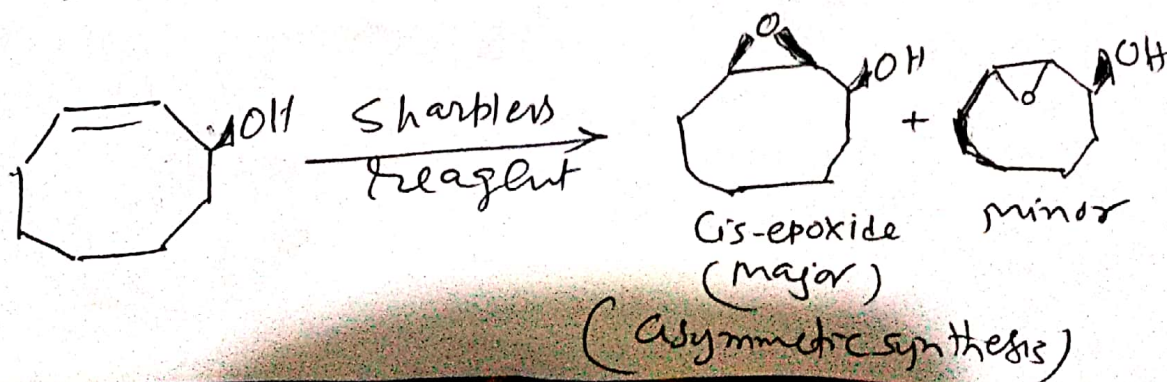
- Sharpless reagent is a mixture of tetraisopropoxy titanium, diethyl(D,R)-N(S,S)-tartarate (achiral ligand), water and tertiary butyl hydroxide.

- The oxidation of Allylic alcohol using Sharpless reagent is called

Sharpless asymmetric epoxidation-

- It is a regioselective & chemoselective oxidation reaction, and enantioselective as exclusively cis-epoxide is formed by epoxidation.

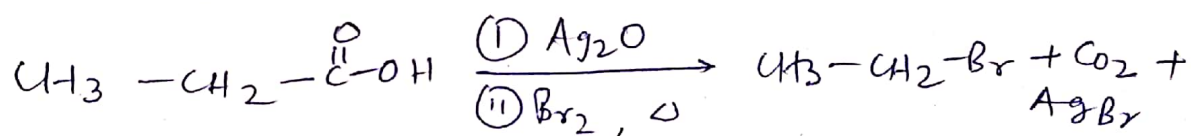
- The epoxidation of cis-2-octen-1-ol with Sharpless reagent to give cis-epoxide as exclusive epoxidation product is called asymmetric Sharpless epoxidation.



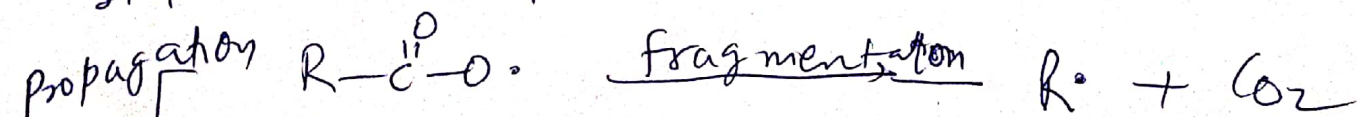
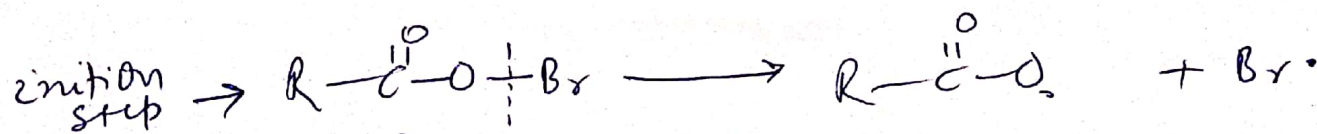
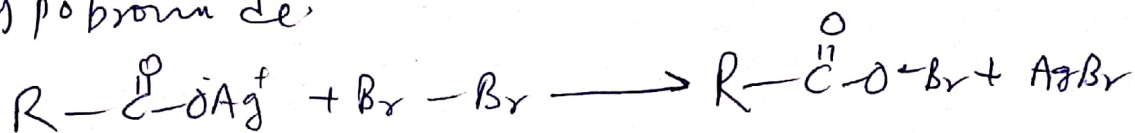
Hunsdiecker Reaction - It is an example of reaction involving free radical pathway.

The formation of alkyl or aryl bromide from corresponding carboxylic acid using Ag_2O followed by Br_2 is called Hunsdiecker reaction.

- It is an example of decarboxylation reaction which gives product with one C-atom less than corresponding carboxylic acid.



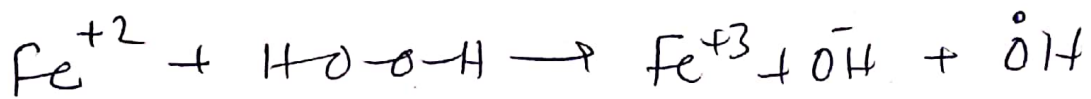
- Pathway: This reaction involves hypobromite formation as a result of precipitation of $AgBr$ followed by free radical formation via homolytic cleavage of oxygen-bromine bond of hypobromide.



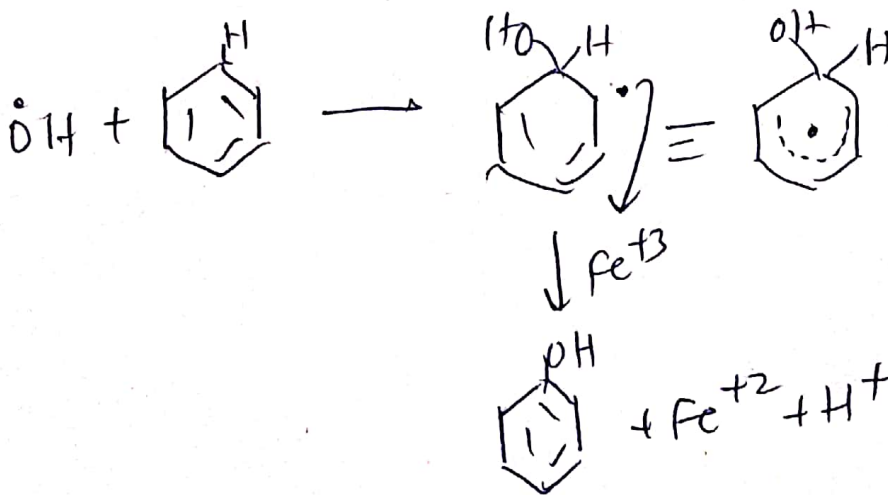
Free radical Reaction

Oxidation of alcohol to aldehyde by oxidation using selective oxidising agent Fenton's reagent.

- A mixture of $FeSO_4$ and H_2O_2 is called Fenton's reagent. It is used to oxidise organic compound.
- In Fenton's reagent Fe^{+2} catalyses the oxidation of H_2O_2 to generate $\cdot OH$ radical which oxidises organic compound.



- It oxidising Benzene to Phenol



- It oxidises glycol to glycolaldehyde

