

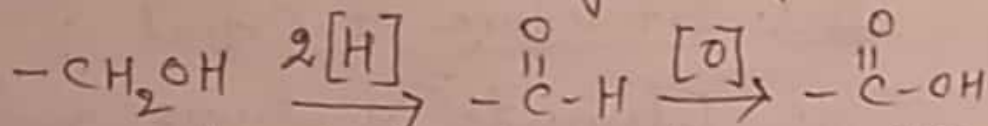
Unit I: Terpenoids :~~Terpene~~

Q. Discuss how the structure of Citral was established?

Ans. Structure of Citral :

1. Elemental analysis and molecular weight determination show that the mol. formula of Citral is $C_{10}H_{16}O$.
2. Citral reacts with 2 moles of Br_2 to form a tetrabromo derivative. It shows the presence of two $C=C$ bonds in the Citral molecule.
3. Citral reacts with hydroxylamine to form an oxime. It also adds sodium bisulphite, which show the presence of an aldehydic ($-CHO$) or a ketonic group.
4. It undergoes reduction with $Na-Hg$ and H_2O to give a 1° alcohol geraniol, $C_{10}H_{18}O$. It undergoes oxidation with Ag_2O to give geranic acid,

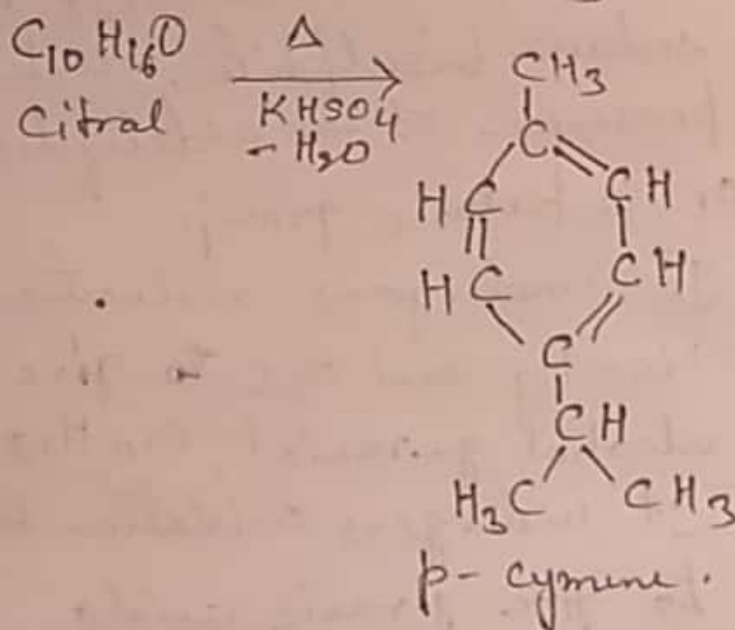
$C_{10}H_{16}O_2$ containing the same number of C-atoms. These reactions show the presence of an aldehydic group.



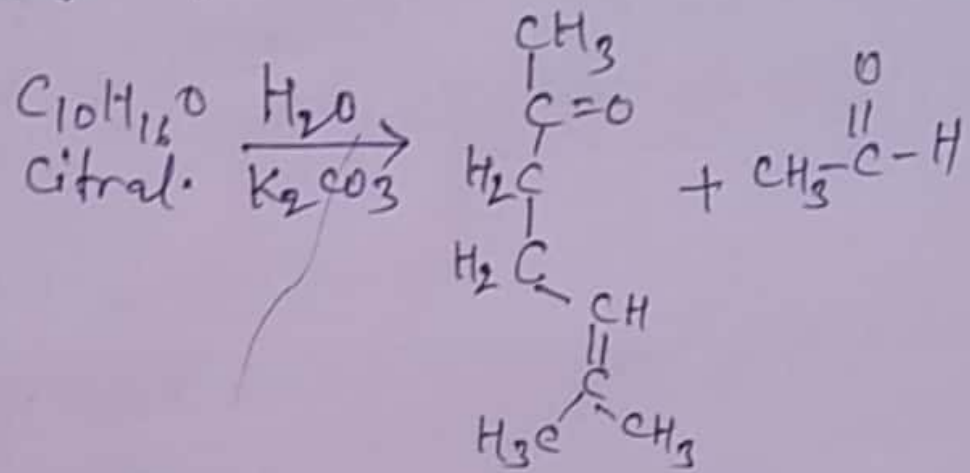
UV studies indicate that -CHO gr. in Citral is present as a part of an α, β unsaturated carbonyl system.

5. When Citral is heated with potassium hydrogen sulphate ($KHSO_4$), it gives p-cymene. This indicates the relative positions of

$-CH_3$ and $-CH$ groups in Citral.



6. Hydrolysis :-



7. Considering above facts, the following structural formula is suggested —

