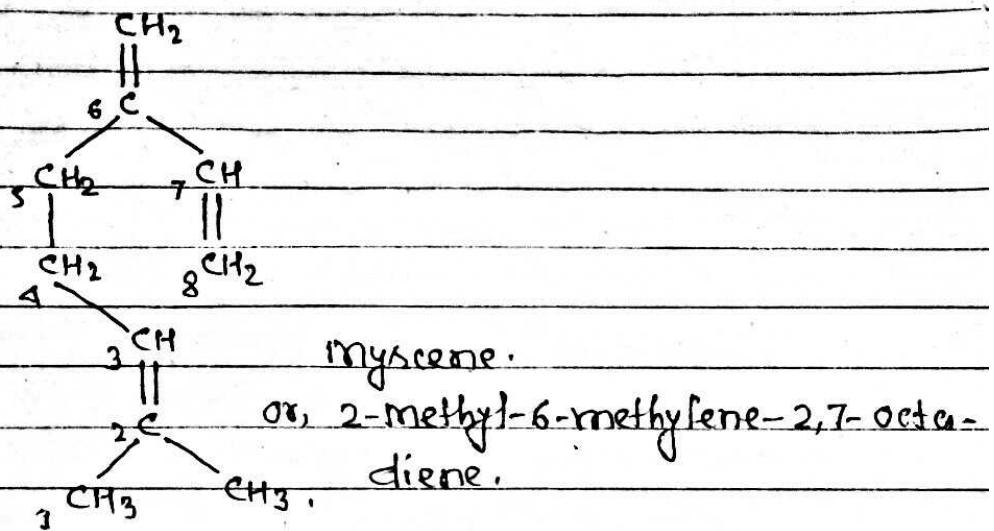


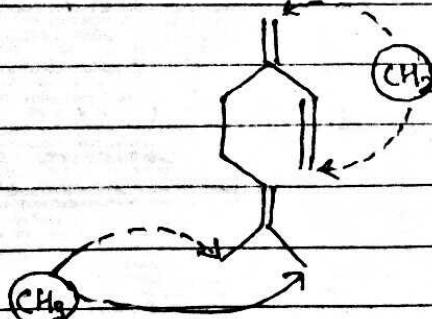
monoterpenes (C_{10}) :- The monoterpenes contain ten carbon atoms (two isoprene units). They may occur as open-chain (acyclic), monocyclic or bicyclic compounds. Some of the important members are following.

Mycene (2-methyl-6-methylene-2,7-octadiene) - $C_{10}H_{16}$,

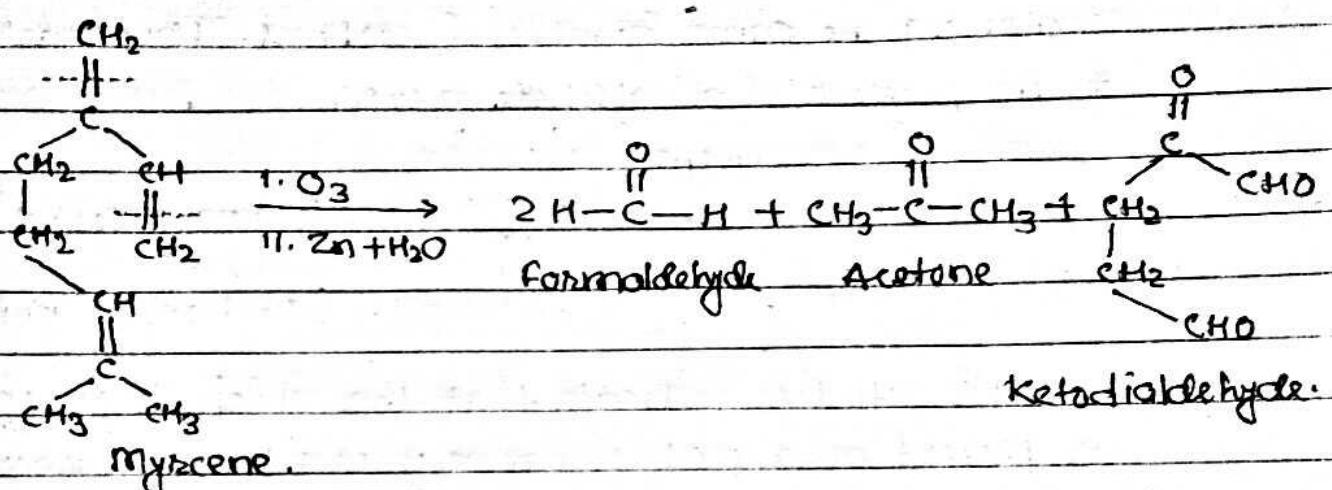
Mycene is an open-chain monoterpene hydrocarbon. It is found in verbena and bay oils.



Line formula of mycene (or, 2-methyl-6-methylene-2,7-octadiene) -



Mycene is a liquid, bp 166.8°C. It undergoes catalytic hydrogenation to form decane ($C_{10}H_{22}$). It reacts with maleic anhydride to yield the corresponding Diels-Alder adduct. Mycene undergoes ozonolysis to give a mixture of formaldehyde, acetone and a ketodialdehyde.



2. Citral (or, 3,7-Dimethyl-2,6-octadien-1-ol) $\text{C}_{10}\text{H}_{16}\text{O}$.

Citral is widely distributed and occurs to the extent of 70 to 80% in lemongrass oil. It is also found in oil of orange oil of lemon (6 to 7%) and in citronella oil.

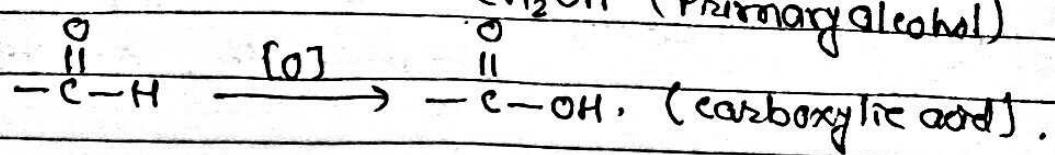
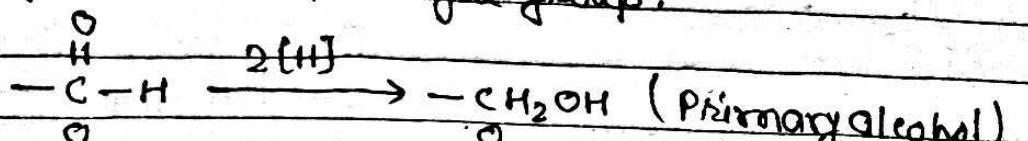
Isolation - The essential oil containing citral is treated with Sodium bisulphite solution. When crystalline citral bisulphite derivative is obtained. This derivative is then hydrolysed with Sodium carbonate to give pure citral.

Structure of citral :-

The structural formula of citral has been deduced from the consideration of facts and conclusions such as following -

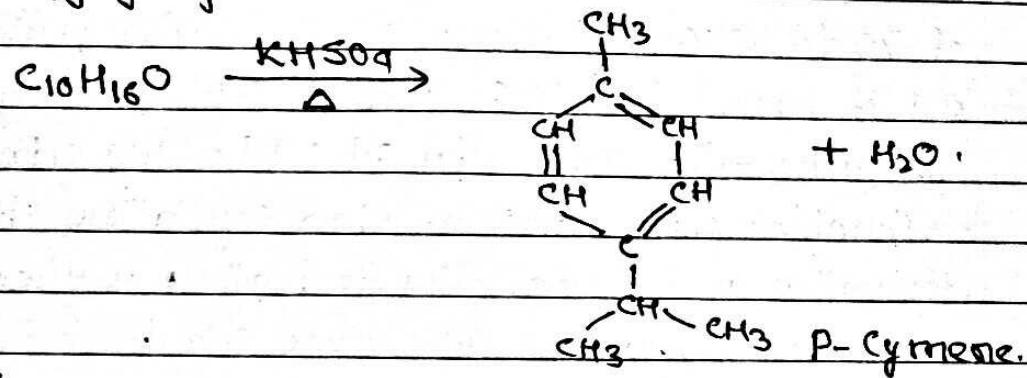
- (i) Elemental analysis and molecular weight determinations show that the molecular formula of citral is $\text{C}_{10}\text{H}_{16}\text{O}$.
- (ii) Citral reacts with bromine (2-molecules) to form tetrabromide derivative. This indicates the presence of two carbon-carbon double bonds in the citral molecule.
- (iii) Citral reacts with hydroxylamine to form an oxime. It also adds Sodium bisulphite. These reactions indicate the presence of an aldehyde (-CHO) or a ketone (-CO-) group.
- (iv) Citral undergoes reduction with sodium amalgam and ester to give a primary alcohol geraniol $\text{C}_{10}\text{H}_{18}\text{O}$. It undergoes oxidation with the silver oxide to yield geranic acid $\text{C}_{10}\text{H}_{16}\text{O}_2$.

containing the same number of carbons. These reactions indicate the presence of an aldehyde group.

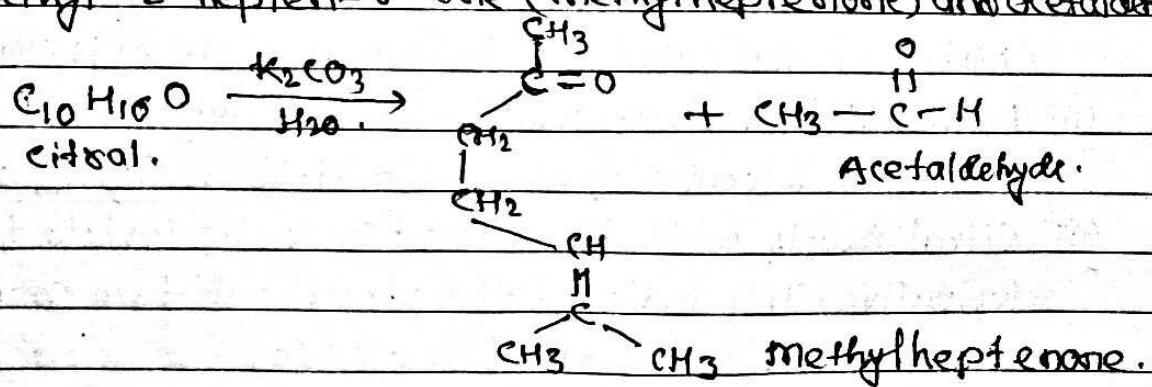


UV studies indicate that the aldehyde group in citral is present as a part of an α, β -unsaturated carbonyl system.

- (v) When citral is heated with potassium bisulphite, it is converted to *P*-cymene. This indicates the relative positions of methyl and isopropyl groups in the citral molecule.



- vi. citral undergoes hydrolysis with potassium carbonate to give 2-methyl-2-hepten-6-one (methyl heptenone) and acetaldehyde.



The above evidence indicates that citral has the following structural formula.

