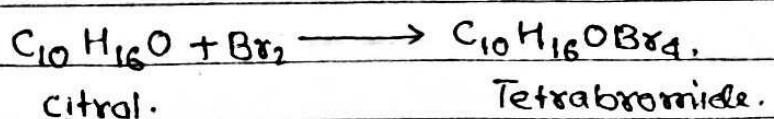


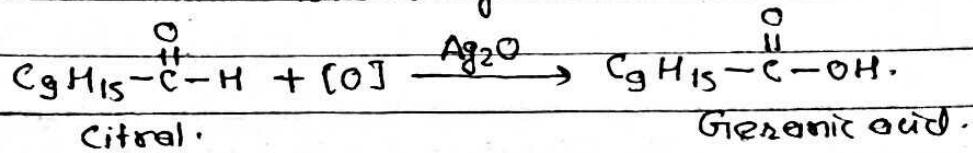
Determination of structure of CITRAL

The structure of citral has been deduced the following facts.

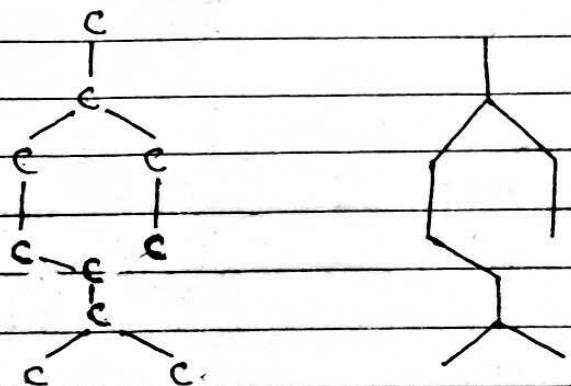
- Elemental analysis and molecular weight determination show that the molecular formula of citral is $C_{10}H_{16}O$.
- Presence of two $C=C$:- If adds two molecules of bromine to form a tetrabromoamine, indicating the presence of two carbon-carbon double bonds.



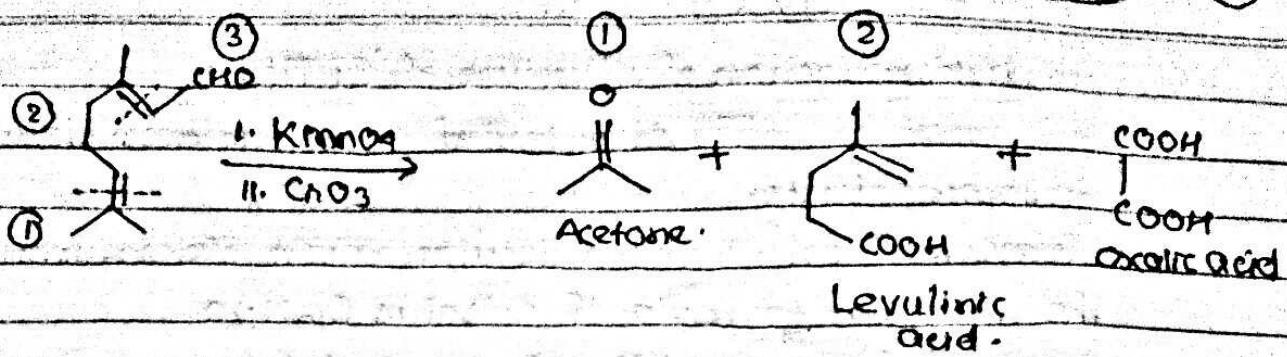
- Presence of CHO :- It forms an oxime and upon oxidation gives geranic acid without loss of any carbon atom. Thus



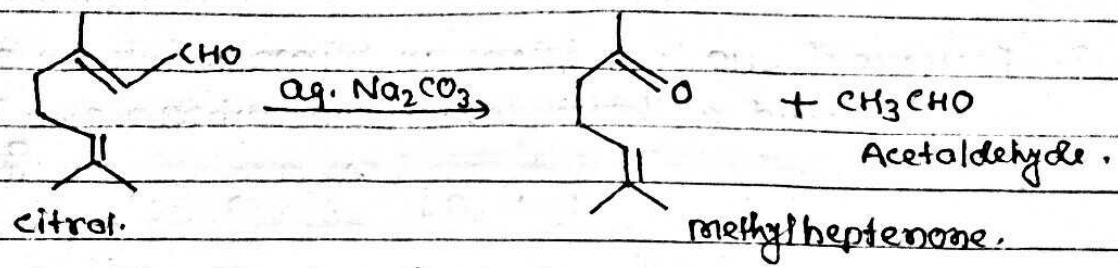
- Carbon skeleton :- Sorenson suggested that two isoprene units are joined head-to-tail in citral (Isoprene rule) and its carbon skeleton was



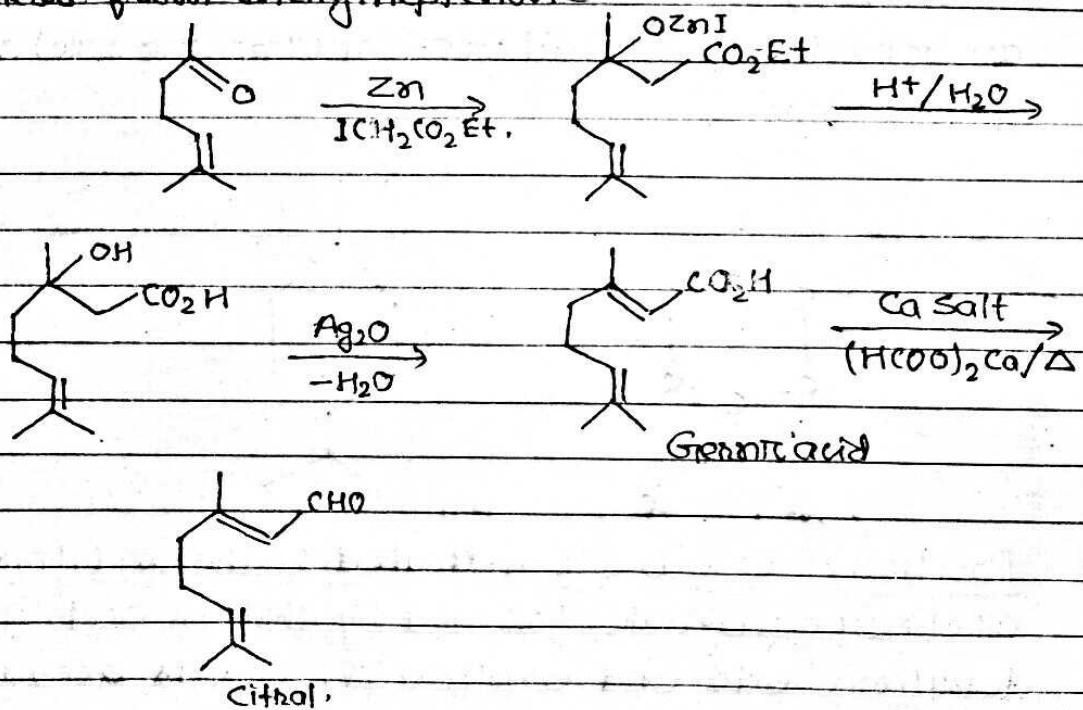
- Position of $C=C$ bonds indicated :- The oxidation of citral with alkaline permanganate, followed by chromic acid, gives acetone, levulinic acid and oxalic acid. This is accountable only if the position of the double bonds is as shown in the formula below.



6. Position of double bonds confirmed :- The above structure of citral is supported by the decomposition of citral with aqueous Na_2CO_3 to give methylheptenone and acetaldehyde.

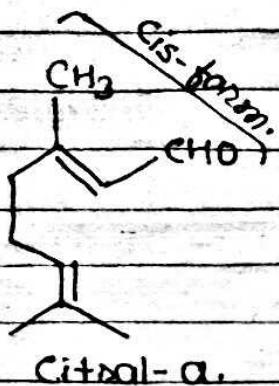


7. Synthesis :- The structure of citral was confirmed by the following synthesis from methylheptenone.

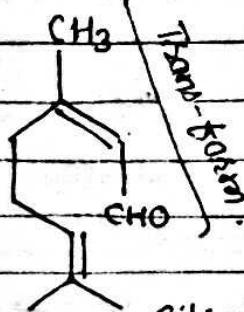


Citral is a colourless liquid. It has a strong-lemon like odour. It exhibits geometrical isomerism about double

bonded carbon carrying CH_3 and CHO groups. The *cis*-isomer is known as Citral-*a* and the *trans*-isomer Citral-*b*.



Citral-*a*.
cis-Citral (90%)



Citral-*b*.
trans-Citral (10%)

Ordinary citral obtained from lemongrass oil is, in fact a mixture of citral-*a* (90%) and citral-*b* (10%).

Use of citral :- Citral is used extensively in the perfume and flavour industry to stimulate lemon-like odours and for the manufacture of vitamin A. Recently citral has become important as a drug for reducing blood pressure.

—x—x— .