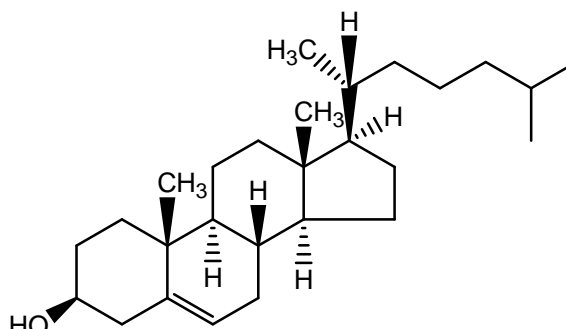


A lecithin
(a phosphatide)



Cholesterol
(a steroid)

1.6. Terpenoids :

The terpenoids form a group of compounds, the majority of which occur in plant kingdom.

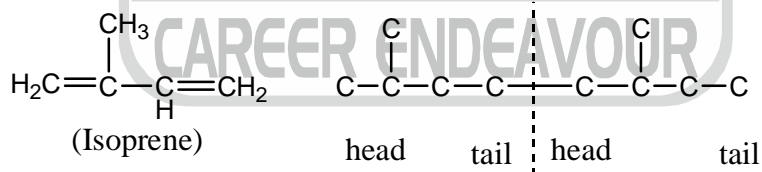
Most natural terpenoid hydrocarbons have a molecular formula $(C_5H_8)_n$, where $n \geq 2$. The value of 'n' is used as a basis for classification.

Number of carbon atoms	Value of n	Class
10	2	Monoterpenoids ($C_{10}H_{16}$)
15	3	Sesquiterpenoids ($C_{15}H_{24}$)
20	4	Diterpenoids ($C_{20}H_{32}$)
25	5	Sesterterpenoids ($C_{25}H_{40}$)
30	6	Triterpenoids ($C_{30}H_{48}$)

Note: The name 'terpene' is inappropriate to include compounds such as alcohols, aldehydes, ketones etc. So, There is a tendency to use the more general name terpenoids.

Isoprene rule: The thermal decomposition of almost all terpenoids gives isoprene as one of the products so, this indicates that the skeleton structures of all naturally occurring terpenoids can be built-up of isoprene units, this is known as the Isoprene rule.

- The isoprene unit in natural terpenoid is joined head to tail fashion.



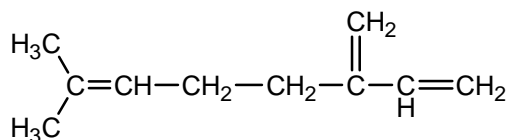
Monoterpenoids: The monoterpenoids may be subdivided into three groups

- (1) Acyclic (2) Monocyclic (3) Bicyclic

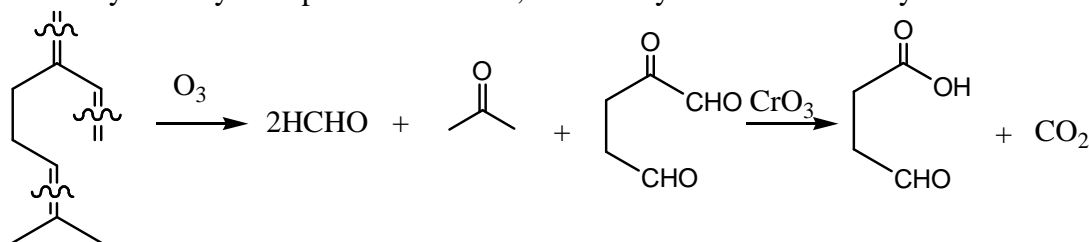
Acyclic Monoterpenoids :

Myrcene: Molecular formula – $C_{10}H_{16}$, B.P. 166–168°C

- This is an acyclic monoterpenoid hydrocarbons.
- Occurs in verbena and bay oils.
- Myrcene contains three double bond two of which are in conjugation.

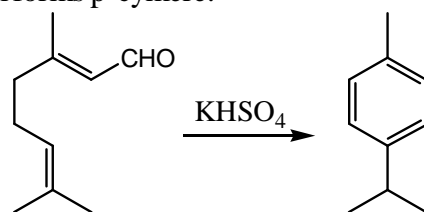


- Ozonolysis of myrcene produces acetone, formaldehyde and ketodialdehyde

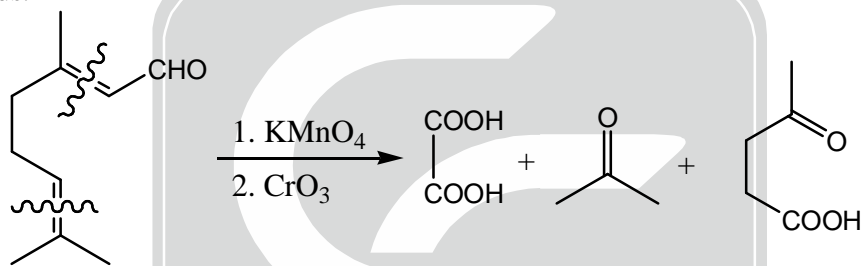


Citral: Molecular formula: $C_{10}H_{16}O$

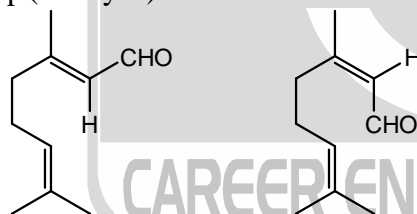
- Most important member of the acyclic monoterpenoids.
- It occurs in Lemon grass oil
- Citral is a liquid which has the smell of Lemons.
- On heating with $KHSO_4$, citral forms p-cymere.



- Citral can be reduced by sodium amalgam to an alcohol, geraniol.
- Oxidation of citral with alkaline permanganate followed by chromic acid, gives acetone, oxalic acid and Laevulic acids.



- Citral shows two geometrical isomers. The functional group (aldehyde) is trans or cis with respect to the methylene group of the main chain.



trans-(or E) form
Citral-a, geranial

Cis-(or Z) form
Citral-b, neral.

- When citral is condensed with acetone in the presence of $Ba(OH)_2$, ψ -ionone is formed and this, on heating with dilute H_2SO_4 in the presence of glycerol forms a mixture of α and β -ionones.

