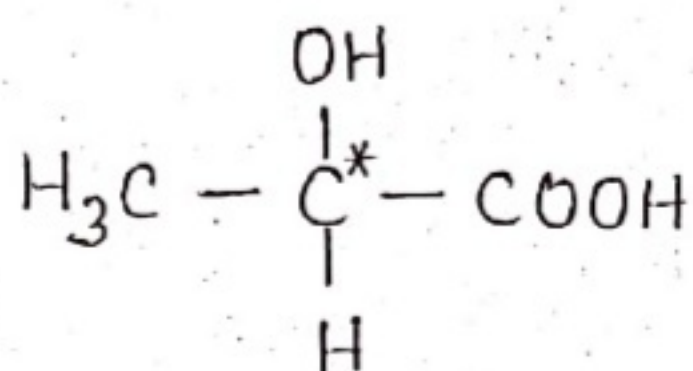


1. HYDROXY ACID & DICARBOXYLIC ACID

27/05/2020 Lecture -6 Deg-II (Sub.)

Topic - Optical Isomerism Of Lactic And Tartaric Acid.

Optical Isomerism Of Lactic Acid



Lactic acid contains one chiral carbon atom.

\therefore No. of optical isomer = 2^n

where n = No. of chiral carbon

No. of optical isomer of lactic acid = $2^1 = 2$

ie; Two three dimensional structure are possible for lactic acid.

* These structure are not identical because they can not be super imposed on each other. One is the mirror image of the other.

* Such non-super imposable mirror image forms are optical isomers and are called Enantiomers.

* Thus three form of lactic acid are known.

* Two are optically active and the third is optically inactive.

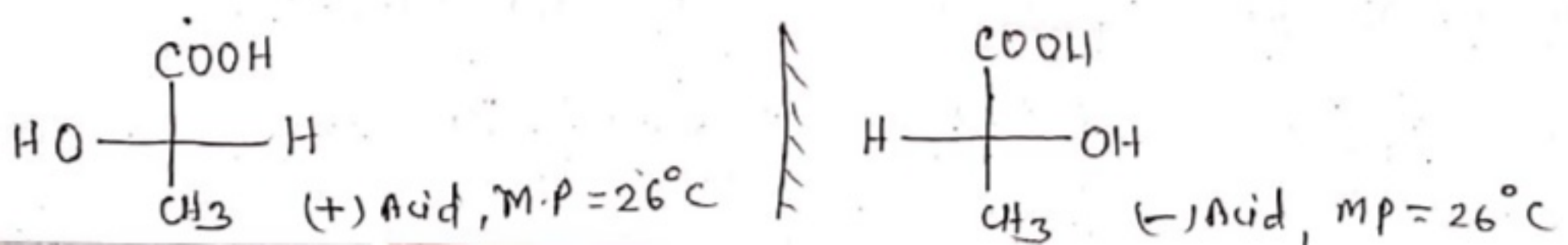
1. (+) Lactic acid :- It rotates the plane of polarised light to the right and is called dextrorotatory.

2. (-) Lactic acid :- It rotates the plane of polarised light to the left and is called laevorotatory.

* (-) Lactic acid is mirror image of (+) Lactic acid and vice-versa.

3. (\pm) Lactic acid :- It does not rotate the plane of polarised light. That is, it is optically inactive.

* It is an equimolar mixture of (+) and (-) forms.



* Equimolar mixture of (+) and (-) forms
(racemic mixture)

3.

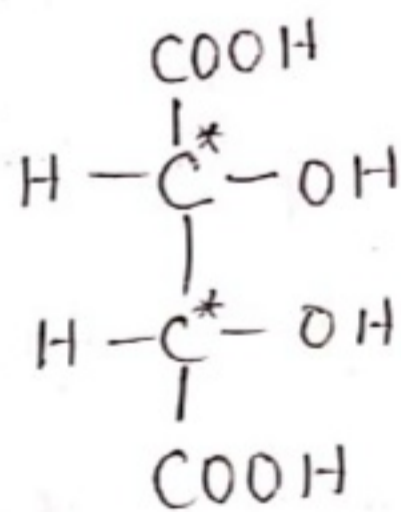
(±) Acid

mp = 18°C

Completed
Lactic acid

Optical Isomerism Of Tartaric Acid

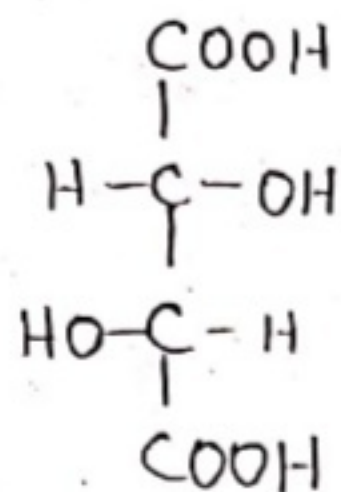
Tartaric acid (2,3-dihydroxybutanedioic acid)
contains two chiral carbon atoms.



$$\boxed{n = 2}$$

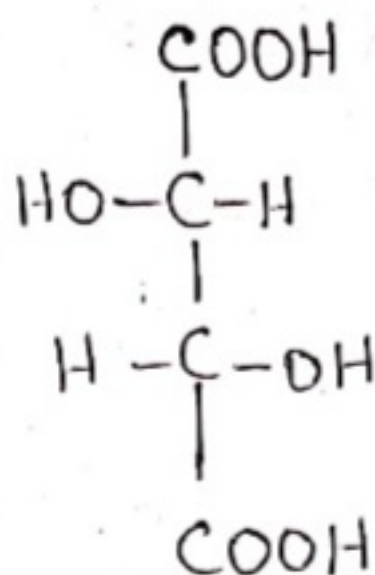
$$\begin{aligned} \therefore \text{No. of optical isomer} \\ = 2^n = 2^2 = 4 \end{aligned}$$

∴ Four forms of tartaric acid are known. Two of them are optically active and two are optically inactive. The optically active forms are related to each other as an object to its mirror image. That is, they are enantiomers.



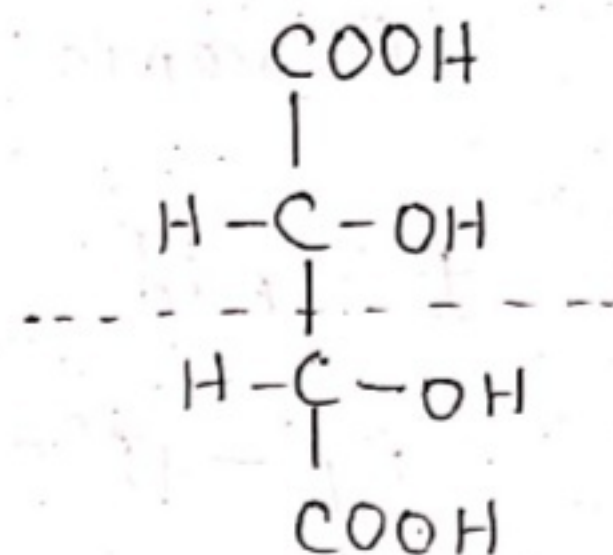
(+) Acid

(dextro) mp = 170°C



(-) Acid

(laevo) mp = 170°C



Meso Acid

mp = 143°C

Optically inactive due to internal compensation.

← Optically Active →

Optical Isomerism Of Tartaric Acid completed.

Hydroxy Acid & Dicarboxylic Acid
Deg-II (Sub.) , Ch-2 , Group-'C'

Completed

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