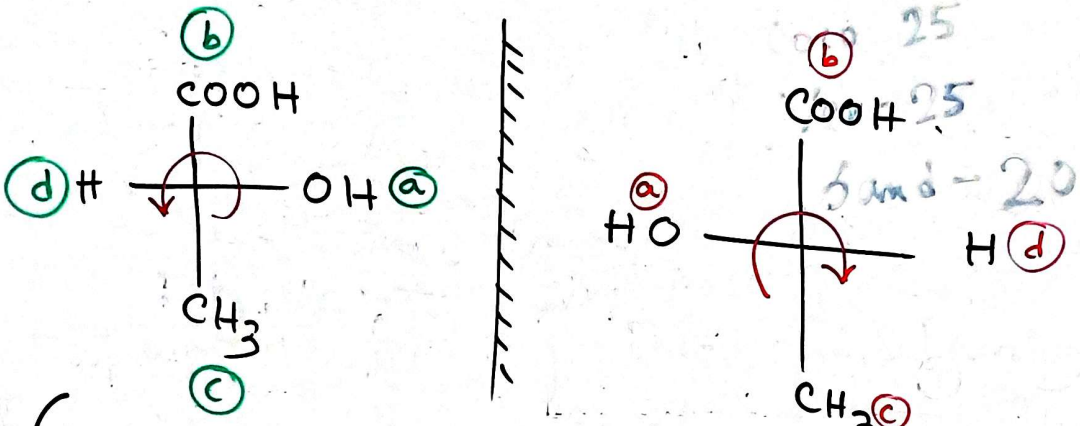
Configurational change



(R- Lacticacid) (S- Lactic acid)

Arrangement of groups around a rigid part of a molecule is called its configuration & change of those groups around the rigid part is called configurational change.

No. of Stereoisomers

① For a unsymmetrical molecule having n number of chiral centres, total no. of stereoisomers $= 2^n$.

② For Symmetrical molecule having n number of chiral centres.

ⓐ When n = even number then no. of isomers $= \left[2^{(n-1)} + 2^{\left(\frac{n-2}{2}\right)}\right]$

* No. of active isomers $= \left[2^{(n-1)}\right]$
* No. of meso isomers $= \left[2^{\left(\frac{n-2}{2}\right)}\right]$

ⓑ When n = odd number then no. of isomers $= \left[2^{(n-1)}\right]$

* No. of meso isomers $= \left[2^{\left(\frac{n-1}{2}\right)}\right]$

⊛ $HOOC-\overset{*}{C}H(OH)-\overset{*}{C}H(OH)-COOH$

This is symmetrical molecule having 2 chiral centres.

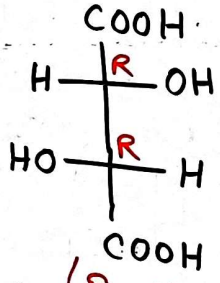
No. of stereoisomers for even no. of chiral centres

$$= \left[2^{(n-1)} + 2^{\left(\frac{n-2}{2}\right)}\right] = \left[2^{(2-1)} + 2^{\left(\frac{2-2}{2}\right)}\right] = \left(2^1 + 2^0\right)$$

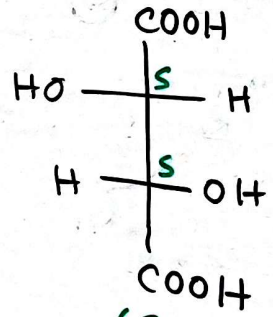
$$= (2+1) = 3$$

$HOOC-\overset{*}{C}H(OH)-\overset{*}{C}H(OH)-COOH$

R	R
S	S
R	S



(R-R)

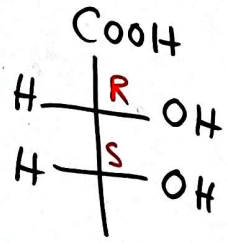


(S-S)

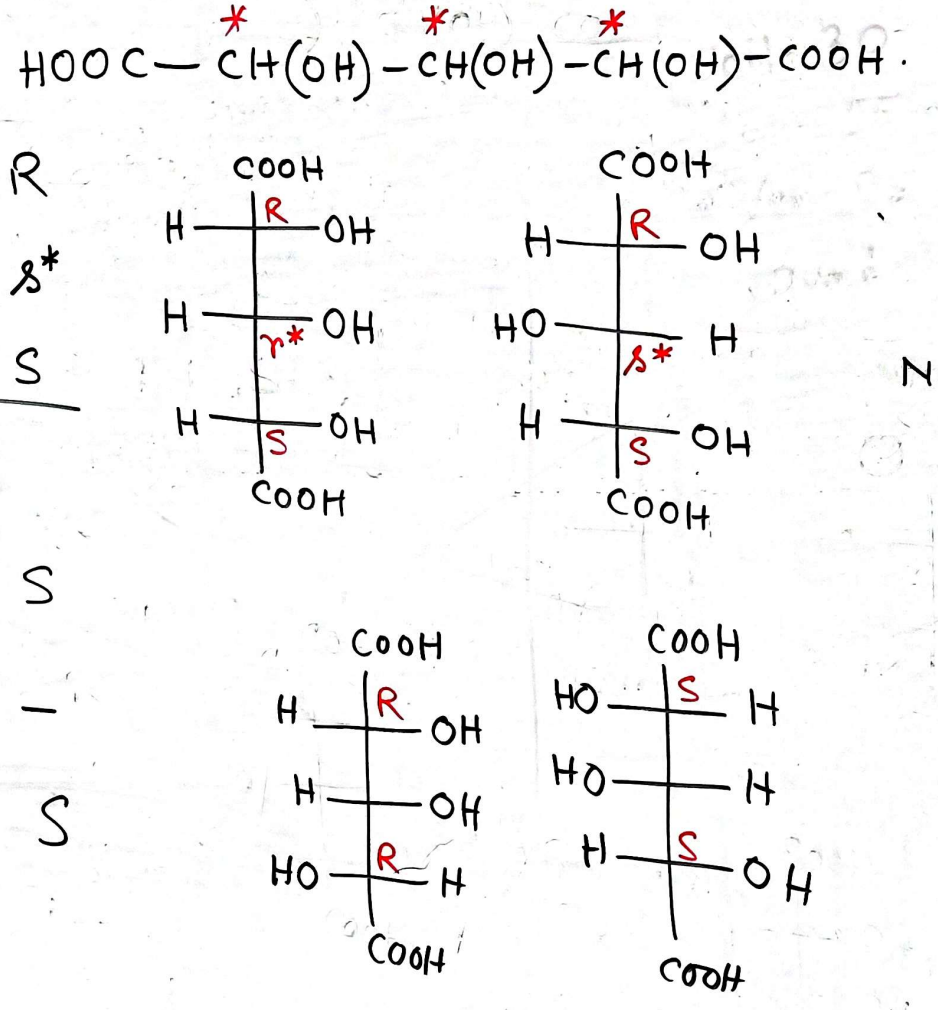
Active

Meso isomers = 1

Active isomers = 2



(R-S) (meso)



Symmetrical molecule

No. of chiral centres = 3

No. of stereoisomers.

$2^{(n-1)} = 2^{(3-1)} = 2^2 = 4$