Date: 15.07.2020

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Determination

The relative configuration is the experimentally determined relationship between two enantiomers even though we may not know the absolute configuration. The sign of rotation of plane-polarized light by an enantiomer is not easily related to its configuration. This is true even for substances with very similar structures. Thus, given Lactic acid, $CH_3CHOHCO_2H$, with a specific rotation $+3.82^\circ$, and methyl lactate, $CH_3CHOHCO_2CH_3$, with a specific rotation -8.25° we cannot tell from the rotation

alone whether the acid and ester have the same or a different arrangement of groups about the chiral centre. Their relative configuration have to be obtained by other means.

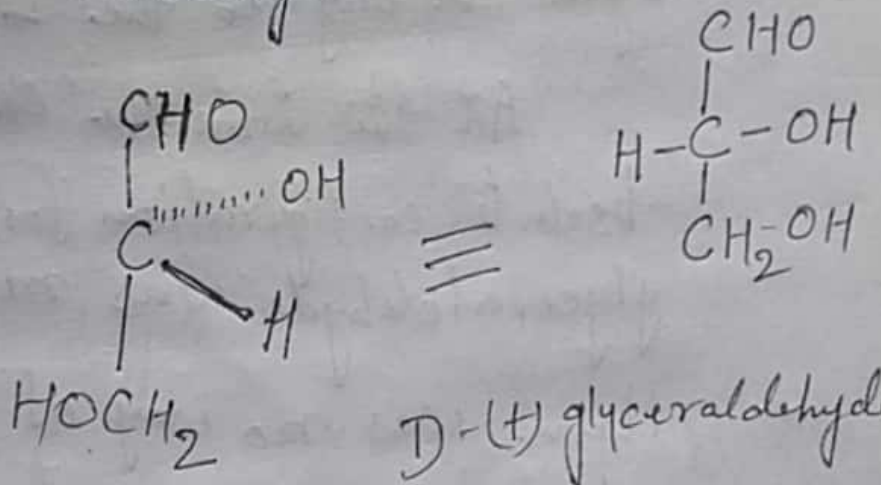
Until 1956, the absolute configuration of no optically active compound was known. Instead, configurations were assigned relative to a standard, glyceraldehyde, which originally was chosen by E. Fischer (around 1885) for the purpose of correlating the configuration of carbohydrates.

3.

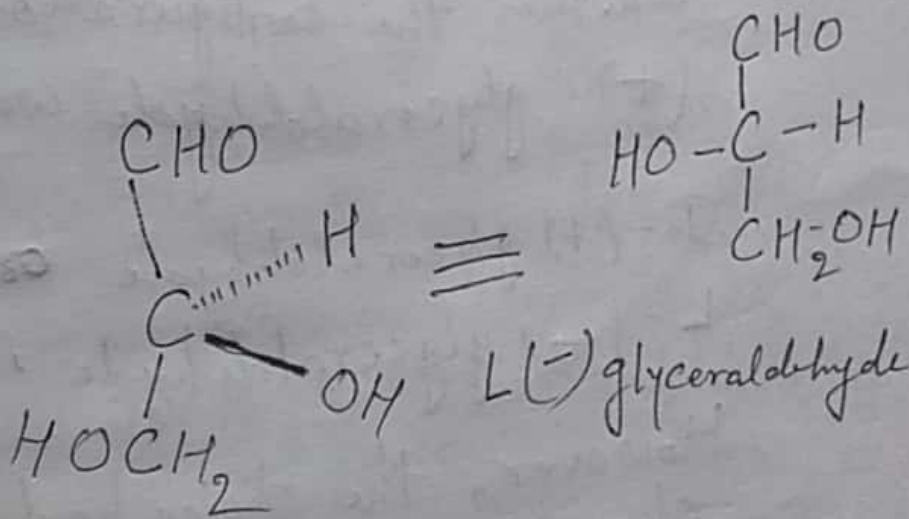
Fischer arbitrarily assigned the configuration

D-(+) glyceraldehyde.

The levorotatory enantiomer is designated as L(-) glyceraldehyde.



D-(+) glyceraldehyde



L(-) glyceraldehyde.

compounds whose configuration are related to D-(+) glyceraldehyde are said to be belong to the D series, and those related to L-(−) glyceraldehyde belong to the L-series.

At the time the choice of absolute configuration for glyceraldehyde was made, there was no way of knowing whether the configuration of (+)-glyceraldehyde was in

D-(+) glyceraldehyde or
L-(−) glyceraldehyde,

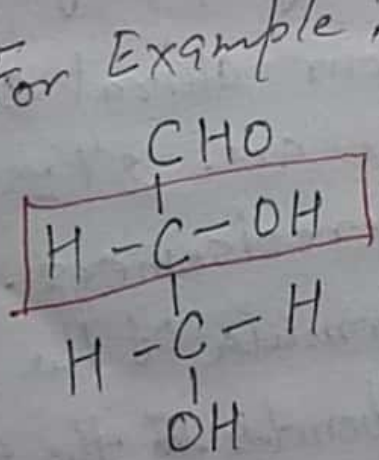
However, the choice had a 50% chance of being correct, and we now know that the D configuration,

5.

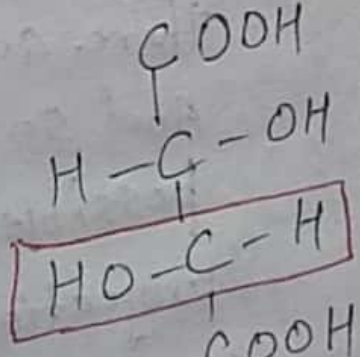
D configuration, is in fact the correct configuration of (+)-glyceraldehyde. This was established through use of a special X-ray crystallographic technique.

The absolute configuration of any compound now is known once it has been correlated directly or indirectly with glyceraldehyde.

For Example;



D (+) glyceraldehyde.



L-(+)tartaric acid.