

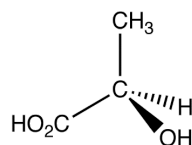
6.2: FISCHER PROJECTIONS TO COMMUNICATE CHIRALITY

Learning Objective

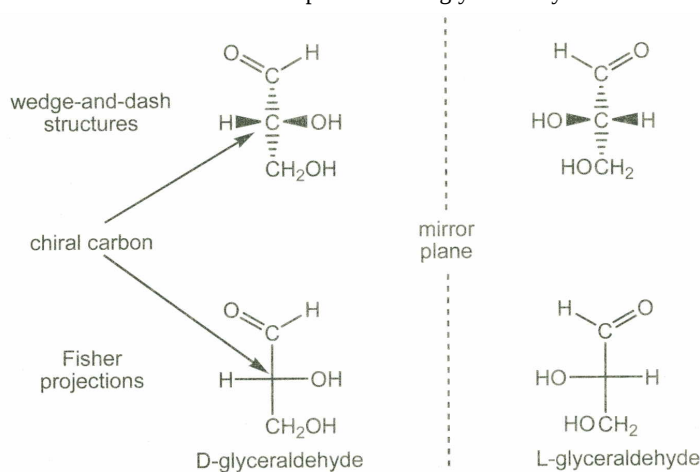
- draw, interpret, and convert between perspective formulae and Fischer projections for chiral compounds

PERSPECTIVE FORMULAS AND FISCHER PROJECTIONS

So far, we have communicated the stereochemical orientation of compounds using the wedges and dashes of perspective formulas. For example, the perspective formula for (*R*)-Lactic acid is shown below.



A Fischer projection is a convention used to depict stereochemistry in two dimensions. The horizontal bonds are seen as wedges and the vertical bonds are seen as dashed lines as shown below in the example below for glyceraldehyde.

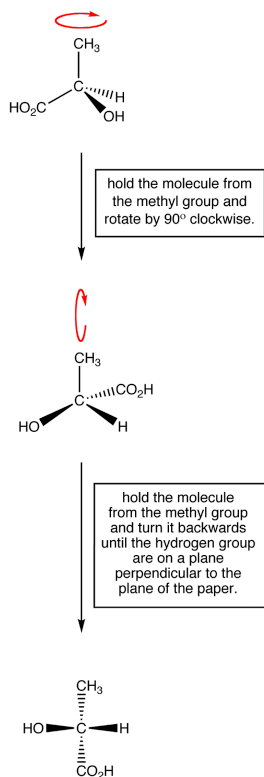


CONVERTING BETWEEN PERSPECTIVE AND FISCHER FORMULAS

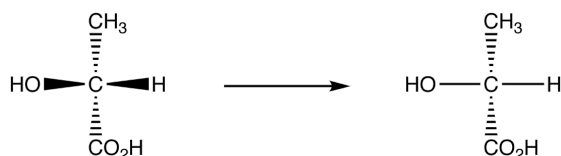
It can be useful to convert between perspective formulas and Fischer projections. Below is one approach using (*R*)-lactic acid as an example..

Step 1: Hold the molecule so that

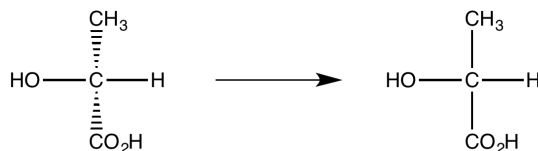
- the chiral center is on the plane of the paper,
- two bonds are coming out of the plane of the paper and are on a horizontal plane,
- the two remaining bonds are going into the plane of the paper and are on a vertical plane



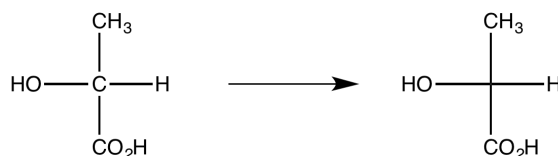
Step 2: Push the two bonds coming out of the plane of the paper onto the plane of the paper.



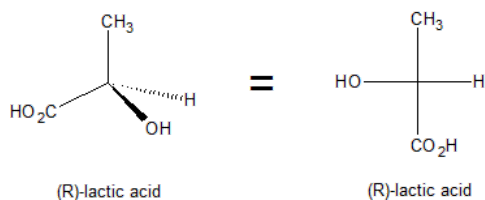
Step 3: Pull the two bonds going into the plane of the paper onto the plane of the paper.



Step 4: Omit the chiral atom symbol for convenience. This is the Fischer Projection of (R)-Lactic acid.

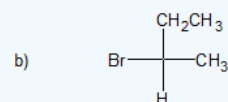
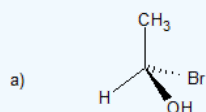


The stereochemical formula for (R)-lactic acid can be drawn using either method. To build this skill, we begin by drawing the structures and converting them step wise. Models can also be helpful. Eventually, we will be able to mentally conversion between these two structures.

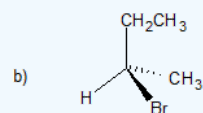
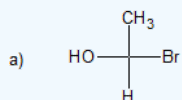


Exercise 1

1. Convert each compound into the alternate stereochemical structure (Perspective \longleftrightarrow Fischer).



Answer



Other representations are possible. If you are not sure, use a molecular model kit to make a model for each structure and then compare the models.

See also [D,L-convention](#).

CONTRIBUTORS AND ATTRIBUTIONS

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