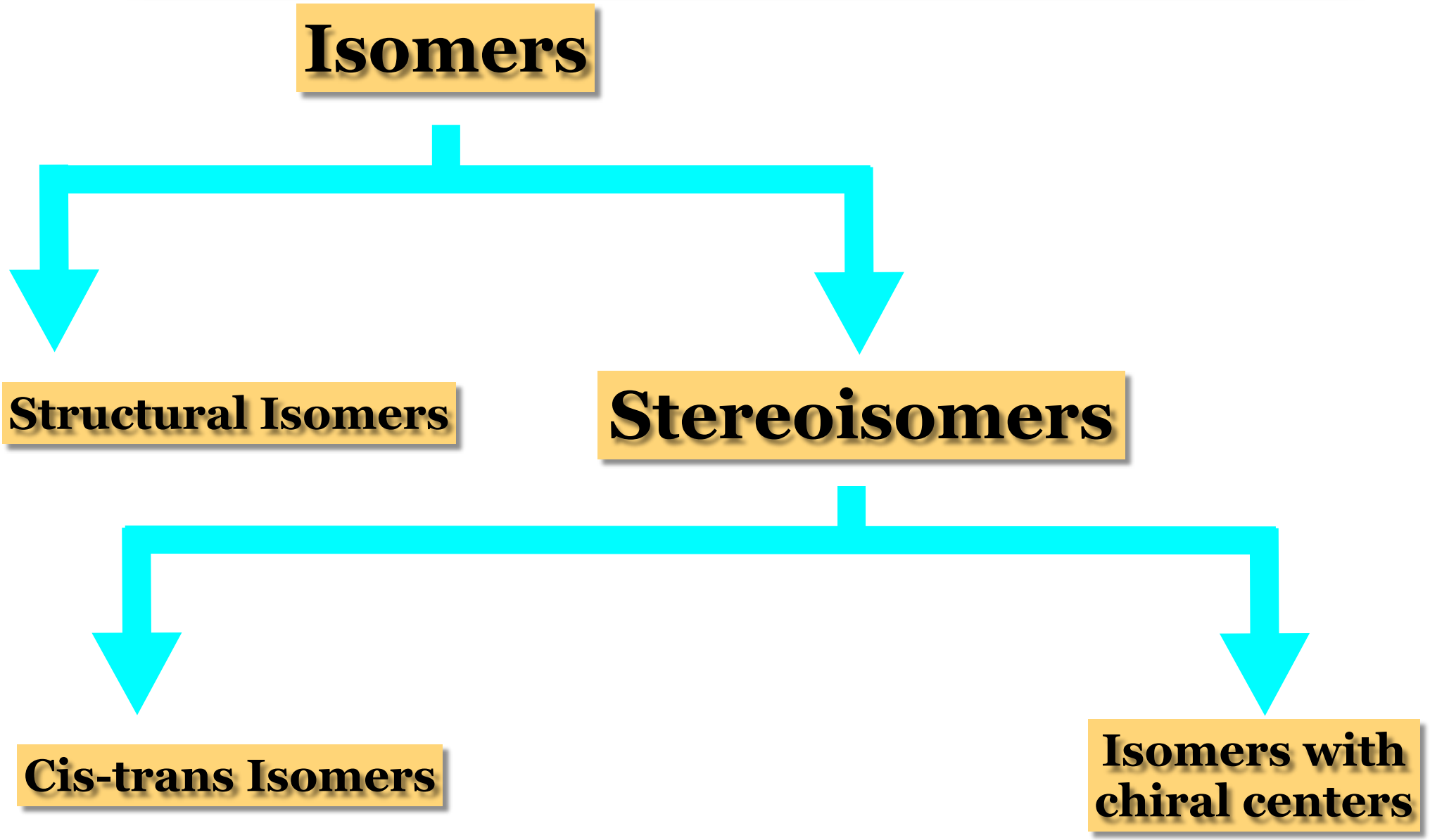
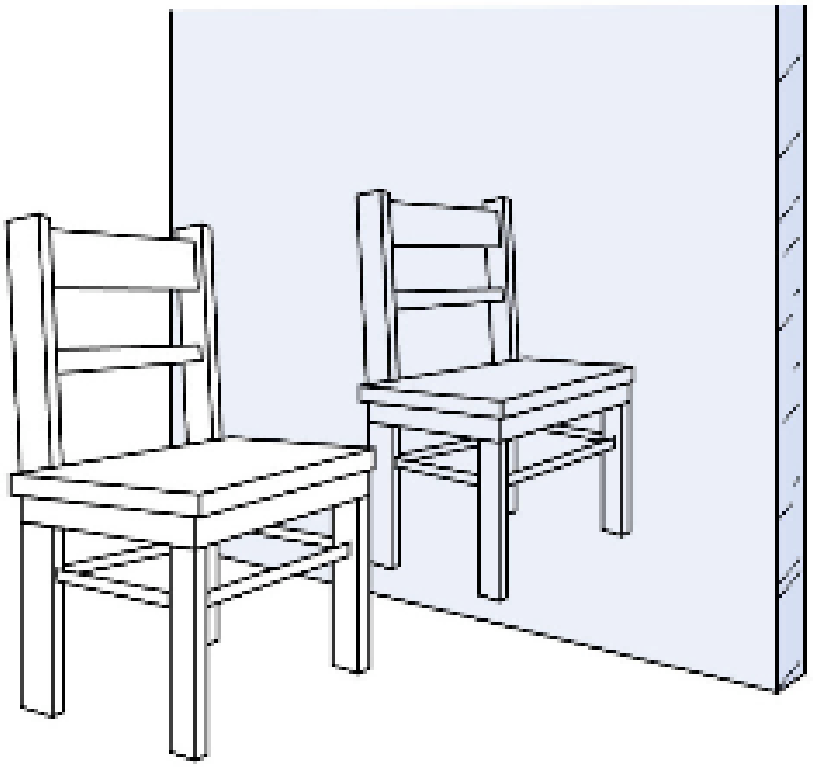
Stereochemistry - Review of Isomerism

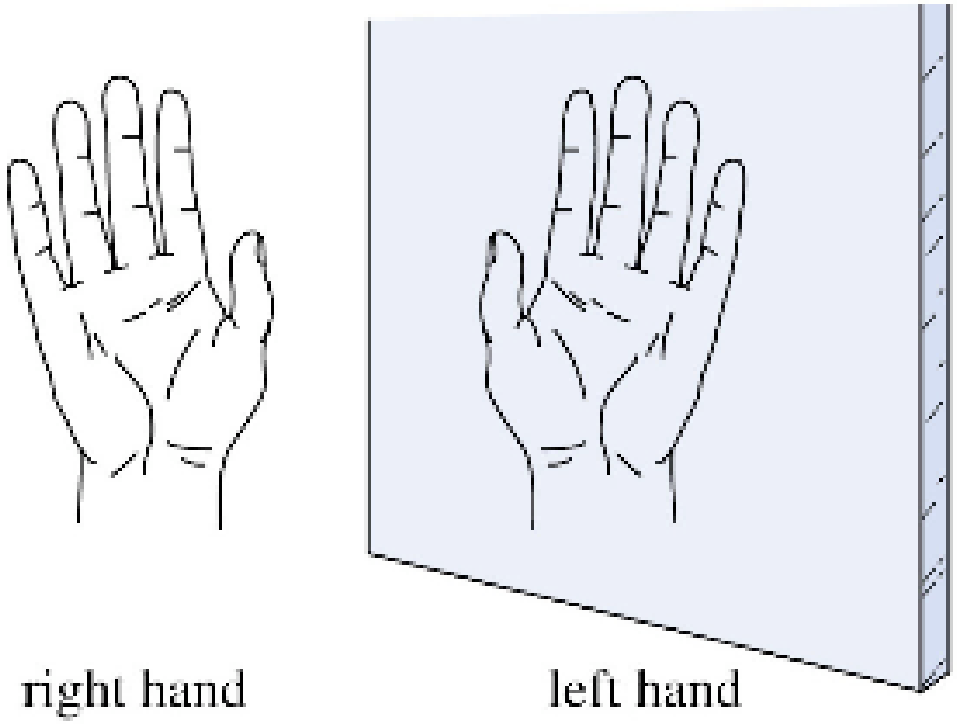


Stereochemistry - "Handedness" in Everyday Objects

We can imagine the mirror image of an object.

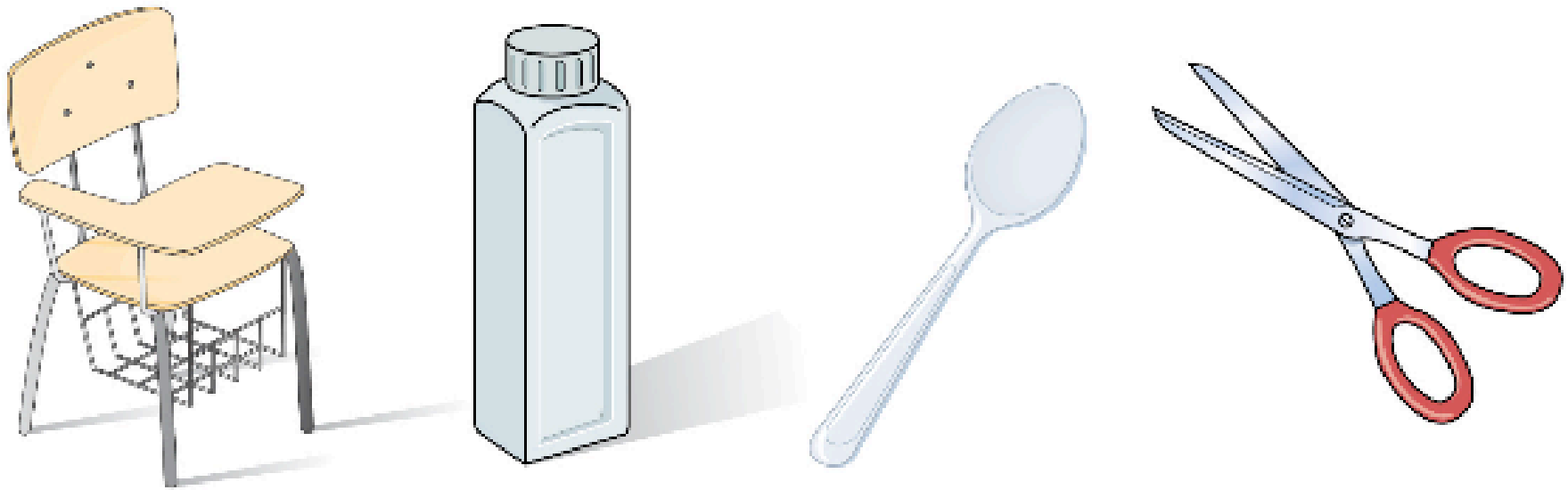


In some cases, the mirror image and the original object are identical.



In some cases, the mirror image and the original object are not identical.

Stereochemistry - “Handedness” in Everyday Objects



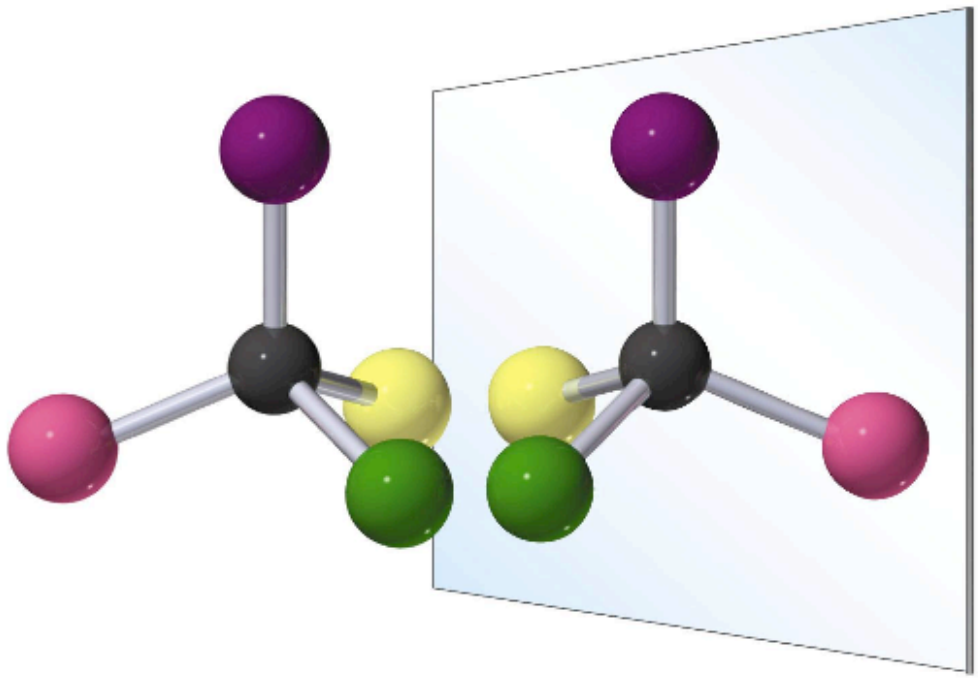
(a) (b) (c) (d)

Stereochemistry - "Handedness" in Organic Compounds

Enantiomers - compounds that have the following characteristics:

1) Molecules of two compounds are mirror images of each other.

2) Molecules of two compounds are nonsuperimposable.

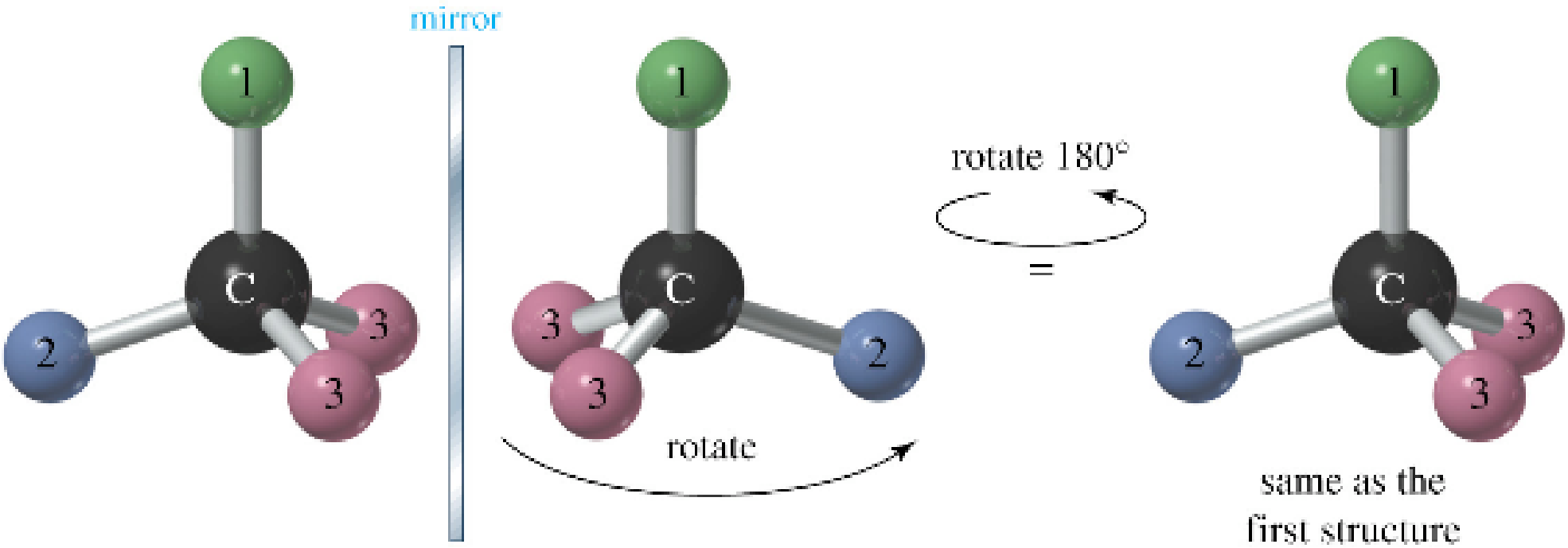


nonsuperimposable
mirror images

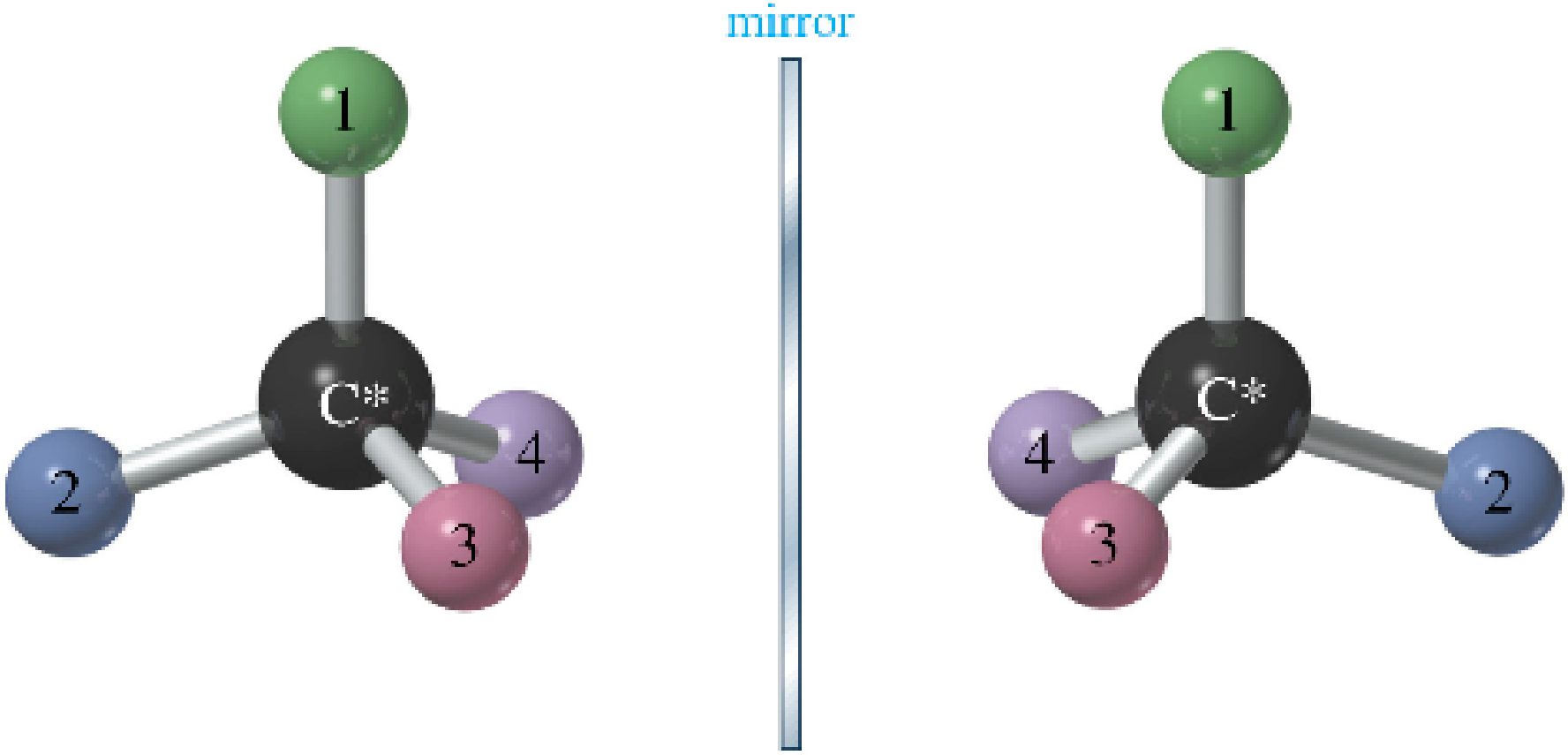
The characteristics of enantiomers are often the result of a single ***"chiral" carbon atom***.

Stereochemistry

All tetrahedral carbons are not chiral.

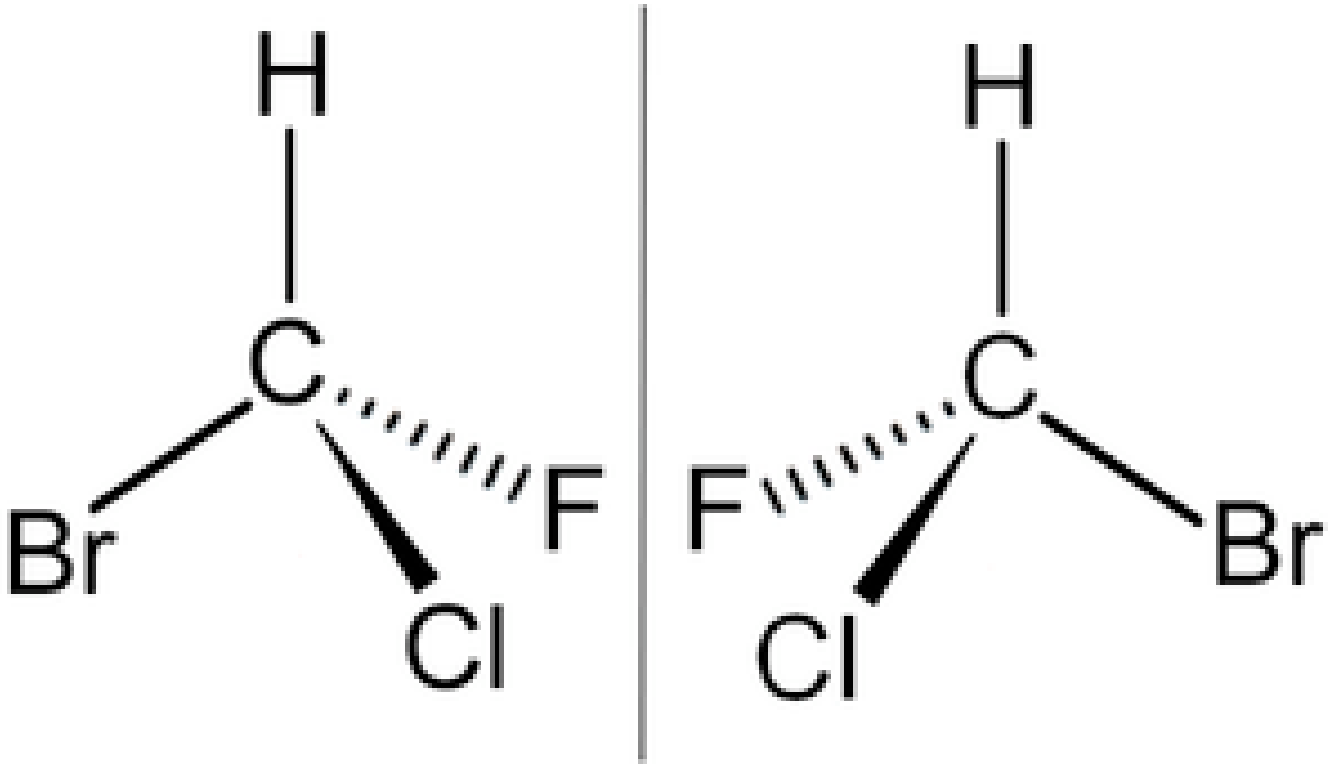


Stereochemistry - A Chiral Tetrahedral Carbon



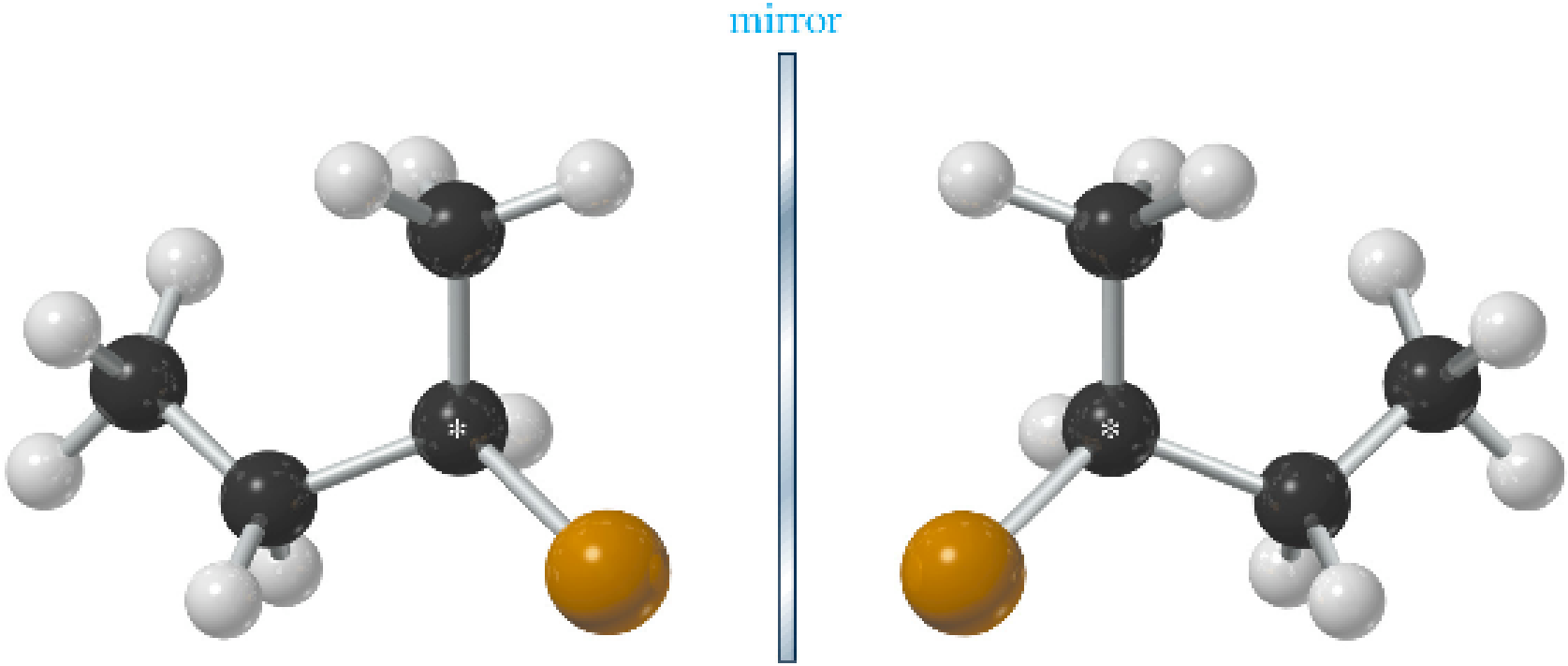
1, 2, 3, and 4 must be different groups.
What are "different" groups?

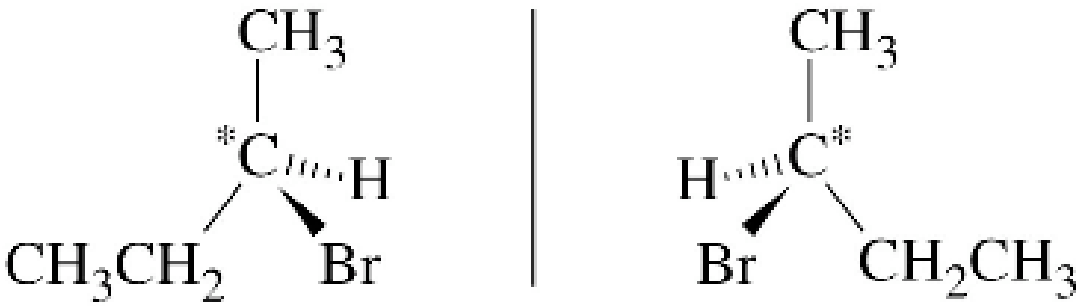
Stereochemistry - Examples of Enantiomers



bromochlorofluoromethane

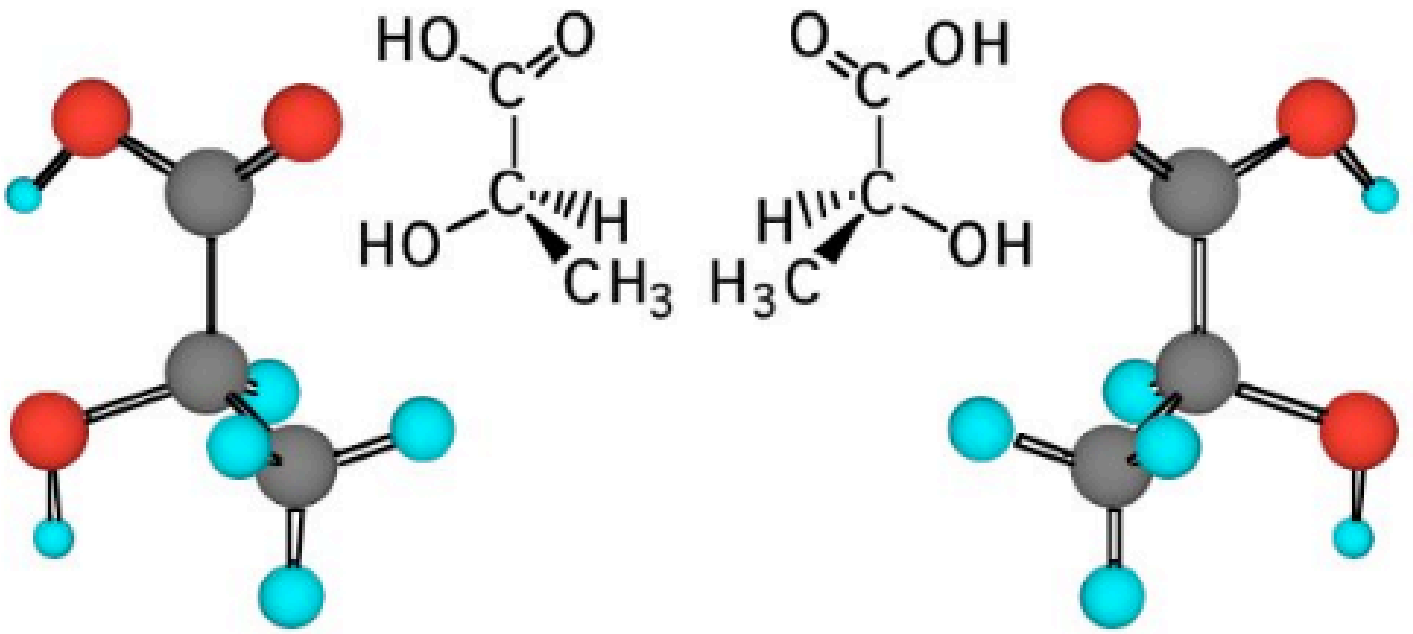
Stereochemistry - Examples of Enantiomers





2-bromobutane

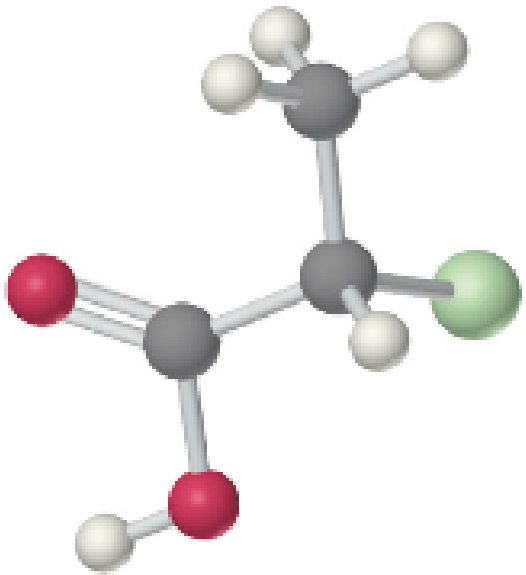
Stereochemistry - Examples of Enantiomers



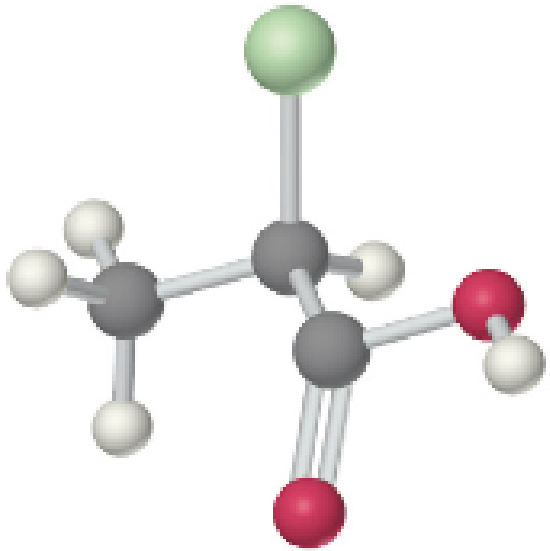
“D” and “L” lactic acid

Stereochemistry - An Interesting Problem

Which of the molecules are mirror images?
Which are identical ?



(a)



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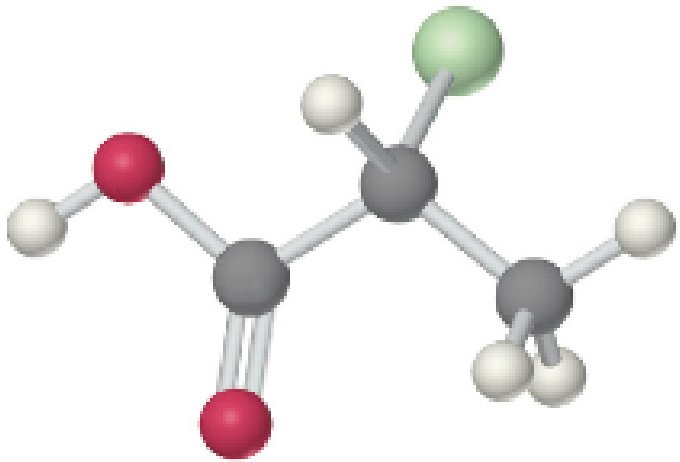

(c)