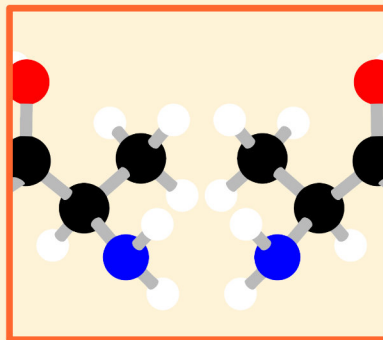


HIGHLIGHTS

- What is an achiral or chiral object?
- The different interactions of chiral & achiral objects.
- Chiral & achiral molecules
- Chirality & symmetry (or the lack of)
- Chiral substances:
 - Enantiomerically pure substances
 - Enantiomerically enriched substances
 - Racemic substances.
- Examples of chiral molecules.



An object can either be *chiral* or *achiral*. Achiral objects are identical to their mirror image. Chiral objects are not. Chiral objects are non-superposable upon their mirror image or they cannot occupy the same volume of space. Achiral objects include balls, spoons and chairs (as long as there is no writing). Chiral objects include shoes, gloves, and screws. Basically, anything that can be described as handed is chiral. The properties of the pair of chiral objects will be almost identical - they are mirror images so they are identical in almost every way. Two chiral objects will only differ in one way, how they interact with another chiral object; a left foot only fits in a left shoe.

Chiral and achiral molecules are exactly the same.

CHEMISTRY CLASSICS

CHIRALITY

A BRIEF INTRODUCTION TO CHIRALITY

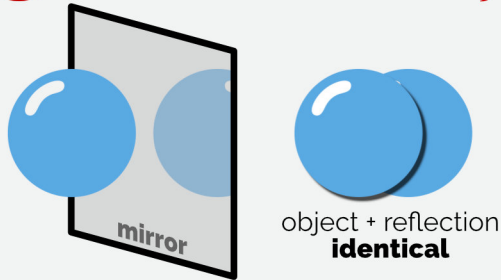


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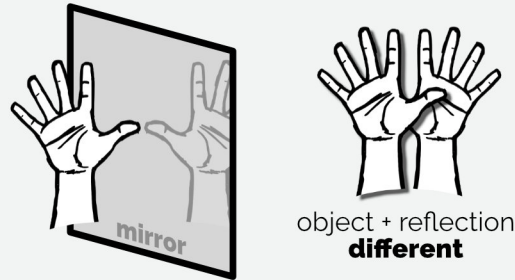
Chirality & Chemistry

1. Chiral & Achiral Objects



Achiral

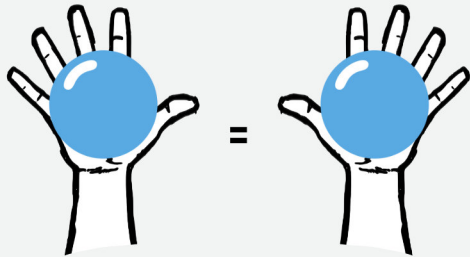
Identical mirror images - objects superposable e.g. balls, chairs, spoons



Chiral

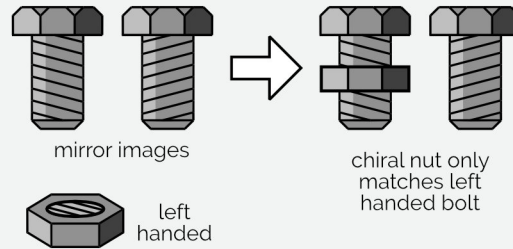
Non-identical mirror images - objects not superposable e.g. Anything handed

2. Importance of Chirality



Achiral + Chiral

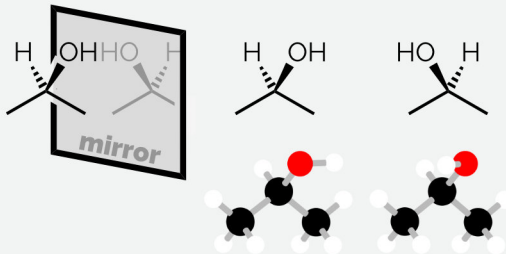
Same interaction regardless of which mirror image of chiral object



Chiral + Chiral

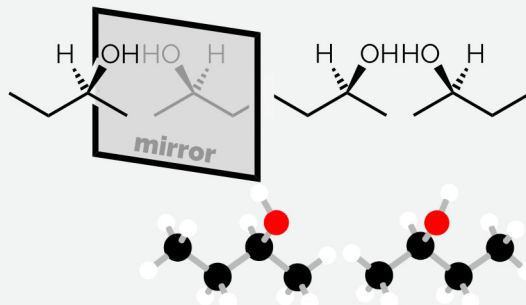
Chiral objects will have **different** interactions with other chiral objects

3. Chemistry & Chirality



Achiral

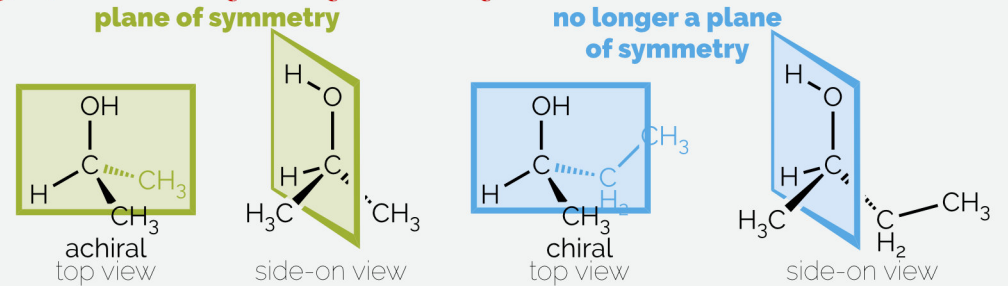
Identical mirror images



Chiral

Non-identical mirror images

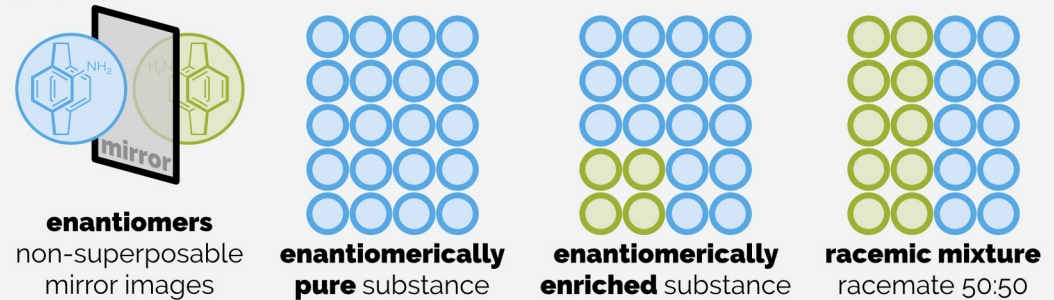
4. Chirality & Symmetry



Achiral molecule - commonly has plane of symmetry but can have a centre of inversion or axis of improper rotation (rotation-reflection)

Chiral molecule - no element of symmetry other than possible axis of rotation

5. Molecules versus Substances



A molecule can be chiral - the pair of mirror images are **enantiomers**. A collection of molecules (a substance) cannot - mixtures classed as above.

6. Examples

