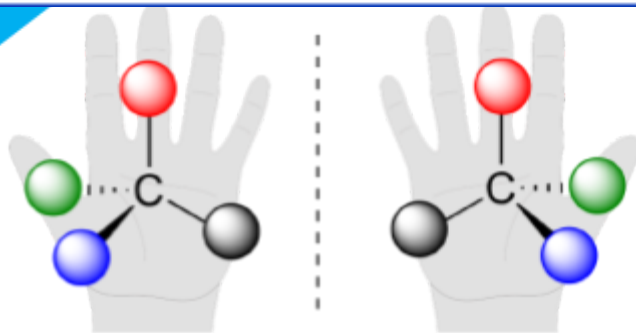


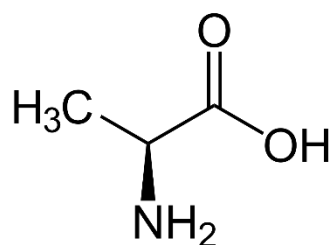
The Magic of Chirality

Chiral objects exist as a pair of non-superimposable mirror images, like our left/right hands!



In Science

Chirality is an important property in chemistry, biology, and physics. One handedness (i.e., enantiomorph) can interact differently with a chiral environment, often rather mysteriously! Chirality is all around us, from small molecules to galaxies.



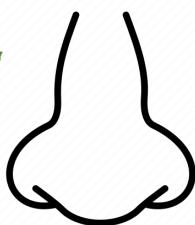
Alanine, an important amino acid

In Nature

Our body can detect chirality: chiral molecules smell/taste different to us. Amino acids, sugars and DNA come in both left- and right-handed versions, but life only selects one form! Amino acids are all left-handed whereas all sugars are right-handed.



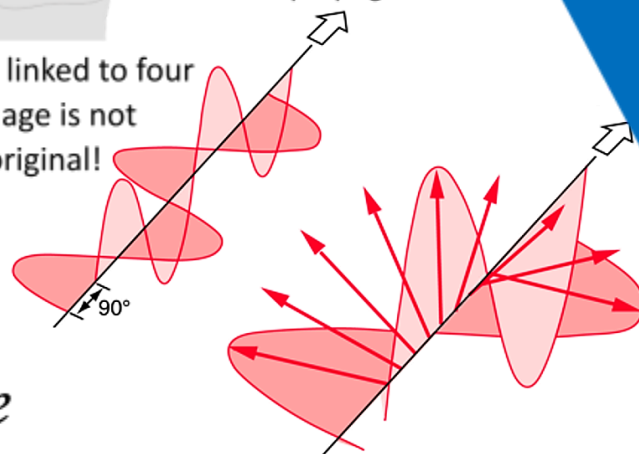
spearmint
(R-carvone)



caraway
(S-carvone)
(think rye bread!)



Direction of propagation



Chiral light: by adding a phase shift between two linearly polarized beams of light, the electric field vector traverses in a helical manner. We call this circularly polarized light (CPL).

In Technology

Chirality is significant in the development of drugs. Drugs interact differently with us depending on if we take the L or R form (e.g., thalidomide, [es]citalopram). CPL is also cleverly used to reduce glare, making TV & phone screens more efficient!

Additional Resources:

ChemLibreTexts: Stereoisomerism & Smell

ACS Molecule of the Week: Carvone

Saint Mary's University Demos: Corn Syrup Birefringence

Samsung: Learn Display - <https://global.samsungdisplay.com/28774>

NGSS: MS-PS-1, MS-PS-3, MS-PS4-2

Cornell REACT

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Thomas Ugras, tju6@cornell.edu