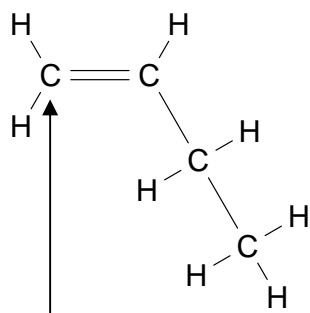


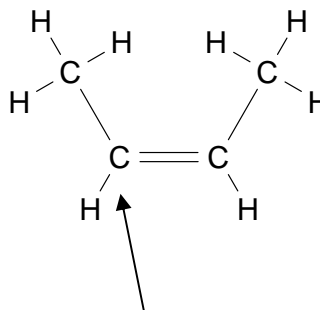
Are there any other types of isomerism? – yes!!

Try C_4H_8 - there are 2 places in the molecule to place the $C=C$ bond.



But-1-ene (1-butene)

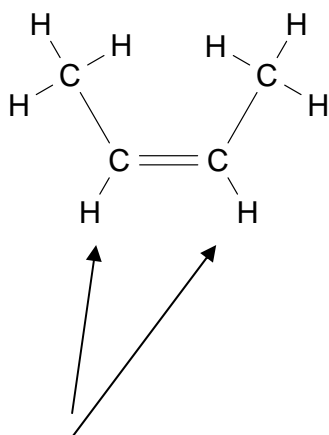
And



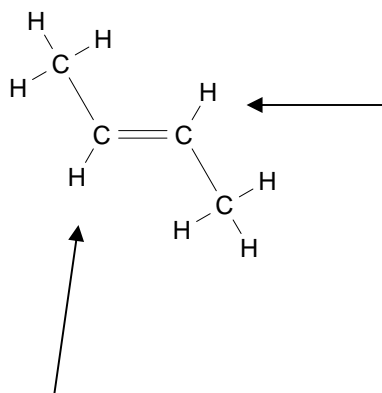
But-2-ene (2-butene)

Alkenes can also show **Geometric Isomerism** – caused by the $C=C$ bond being **unable to rotate**.

Look at the molecule but-2-ene. 2 possible structures can be drawn



cis-but-2-ene



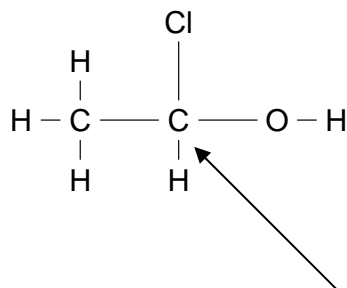
trans-but-2-ene

Physical properties are different but the **chemical properties stay the same**.

Optical Isomerism

– caused when a carbon atom becomes a **Chiral Centre**. This means it has **4 different groups** attached to it.

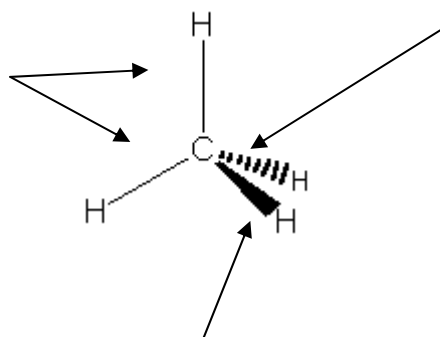
Example



This carbon is a **chiral centre**. It has **4 different groups** attached to it. This molecule will exist as **two optical isomers called enantiomers**. The 2 enantiomers are **mirror images** of each other.

Exam hint – be prepared to draw optical isomers!

Hydrogens in the **same plane** as the paper



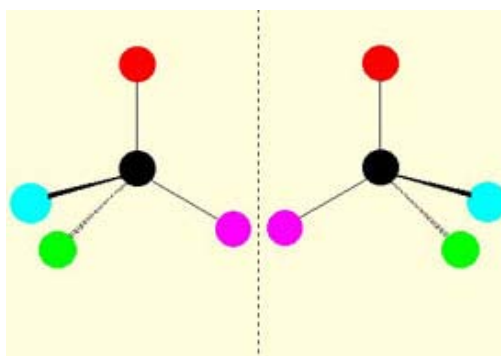
The dotted wedge means this hydrogen is **behind the plane** of the paper.

Optical isomers rotate plane polarised light.

One molecule will rotate plane polarised light clockwise so many degrees. The other enantiomer will rotate plane polarised light anticlockwise by the same number of degrees.

The solid wedge means this hydrogen is **in front of the plane** of the paper.

Plane (flat) mirror



2 mirror images called enantiomers
WANGANUI HIGH SCHOOL