

PROSPERITY ACADEMY

**A2 CHEMISTRY 9701**

**Crash Course**

RUHAB IQBAL

**ORGANIC  
SYNTHESIS**

**COMPLETE NOTES**



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# Organic Synthesis:-

Optical isomers:- Not superimposable mirror images of each other. It occurs when a carbon is chiral  
↳ bonded to 4 different groups

- Optical isomers are also known as "Enantiomers"

- They have same physical properties (m.p, b.p, solubility) and chemical properties (types of reactions) except for:-

1) they rotate plane polarised light by equal amounts in opposite directions.  
isomer A: rotates  $10^\circ$  clockwise      isomer B: rotates  $10^\circ$  anticlockwise

2) They might have different biological activity - Enzymes have specific sites to where compounds attach  
isomer A fits but isomer B might not fit or fit somewhere else not needed

- A single optical isomer will rotate plane polarised light and such a solution is called optically active.

- A solution with a mixture of both optical isomers does not rotate plane polarised light and is known as racemic mixture

## Drug synthesis:-

- Living things produce only 1 isomer because they use enzymes which can only fit specific molecules
- We need to make sure we produce the correct isomer artificially otherwise it will have wrong effects
- Producing just one isomer artificially is known as Asymmetric synthesis. Its benefits are:

- 1) Reduces undesirable side effects
- 2) Cheaper in long term otherwise half of drug goes to waste
- 3) Smaller doses given to patient.

## Methods of Asymmetric Synthesis:-

- 1) Produce both isomers and then separate them through optical resolution
- 2) Using a single isomer reactant
- 3) Using chiral catalyst or enzymes to produce only one isomer.