Organic Synthesis Map

OCR A Level Chemistry A · 4.2.3 Organic synthesis

1 Reflux

4.2.3(a)

- Condenser upright
- Top left **open**
- Water in at the bottom
- Vapour returns



2 Distillation

4.2.3(a)

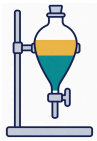
- Bulb at the side arm
- Collect at the boiling point
- Aldehydes as they form
- Redistil to purify

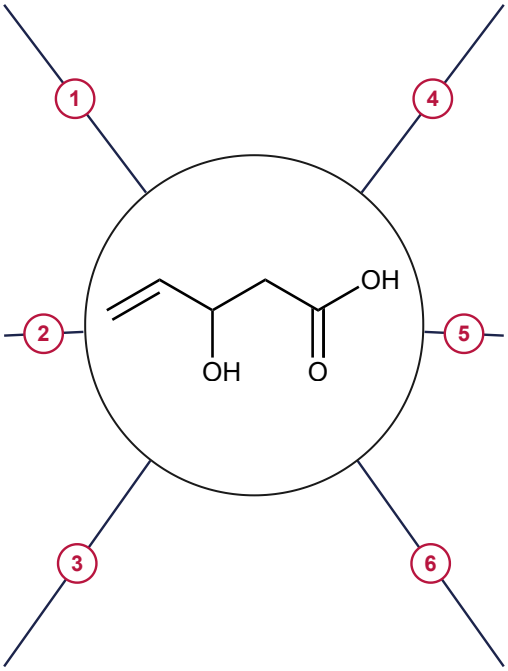


3 Purifying a liquid

4.2.3(a)

- Separating funnel
- Add water: which grows?
- Anhydrous $MgSO_4$
- Clear means dry





4 Several groups

4.2.3(b)

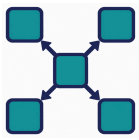
- **Ring** each group
- Give its test
- Type of alcohol matters
- Copy the rest



5 Aliphatic junctions

4.2.3(c)

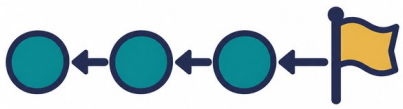
- Haloalkanes and alcohols
- Alkene links them
- Aldehyde, ketone, acid
- Know each reagent



6 Two-stage routes

4.2.3(c)

- Start at the **target**
- Find the middle compound
- Reagent and **conditions**
- Reflux or distil?



Key reagents for two-stage routes

reagent and conditions

Change	Reagent	Conditions
Alkene to haloalkane	HBr	Room temperature
Alkene to alcohol	Steam	H_3PO_4 catalyst
Alcohol to alkene	H_3PO_4	Heat
Haloalkane to alcohol	NaOH(aq)	Reflux
Primary alcohol to acid	Excess $K_2Cr_2O_7/H^+$	Reflux

Worked examples

Move a group

- Propan-1-ol to 2-bromopropane
- H_3PO_4, heat: propene
- **HBr**: 2-bromopropane

Alkene to ketone

- Propene to propanone
- Steam, H_3PO_4: propan-2-ol
- **$K_2Cr_2O_7/H^+$**, reflux

Aldehyde or acid

- Same reagent, same alcohol
- Distil: the aldehyde
- **Reflux**: the acid

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