Practical Techniques Summary Map

Edexcel International A Level Chemistry · Unit 5 · Topic 20C Practical Techniques

1 Heating under reflux

20.5

- Upright condenser
- Vapour runs back
- Top stays **open**
- Granules, electric heater



2 Distillation

20.5

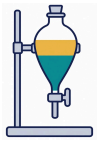
- Lowest bp distils first
- Bulb at the **side arm**
- Collect near the bp
- Steam: oils below 100 °C

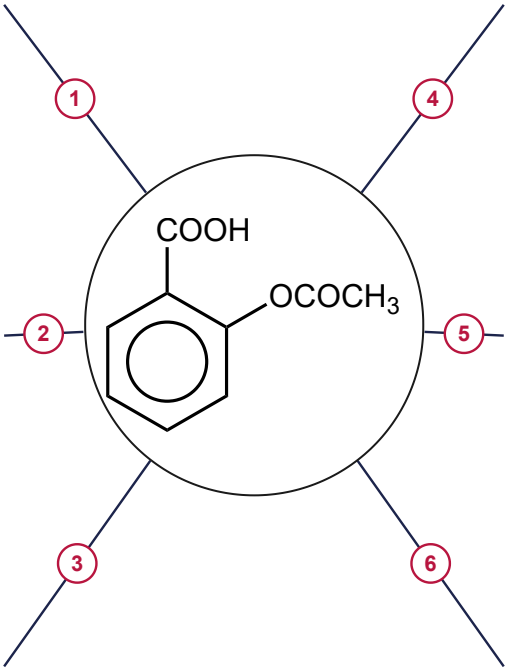


3 Washing and drying

20.5

- Na_2CO_3(aq) removes acid
- Vent the CO_2
- Density sets the layers
- Anhydrous $MgSO_4$ dries





4 Recrystallisation

20.5

- **Minimum** hot solvent
- Hot filter, then cool
- Filter under suction
- Wash cold, then dry



5 Melting temperature

20.5

- Slow heating
- Pure: sharp, at data value
- Impure: low and broad
- Boiling: steady vapour



6 Hazards and control

20.3

- Read the **hazard data**
- Flammable: no flame
- Toxic vapour: fume cupboard
- Control fits the hazard



Choosing a procedure

match the method to the job

Job	Method	Why
Slow, volatile reaction	Reflux	Vapour returns
Acid left in an ester	Na_2CO_3 wash	Salt goes to water
Water in a liquid	Anhydrous $MgSO_4$	Forms a hydrate
Impure solid	Recrystallise	Impurity stays dissolved
Oil decomposes at bp	Steam distillation	Below 100 °C

Worked examples

Aspirin yield

- 2.76 g acid, Mr 138
- 2.52 g aspirin, Mr 180
- **70.0%**

Melting range

- Aspirin 136 °C in data
- Sample 128–133 °C
- **Impure**

Control measure

- Ether: bp 35 °C, flammable
- No flames nearby
- **Water bath, fume cupboard**

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