

Chapter 4: Exploring diversity of matter using physical techniques

4.1 : What is the purpose of separation techniques?

SEPARATION TECHNIQUES

- * reduce, reuse, recycle

4.2: How do we choose the appropriate separation techniques?

* Physical separation techniques:

1. magnetic attraction
2. filtration
3. evaporation
4. distillation
5. chromatography

MAGNETIC ATTRACTION

Examples :

non-magnetic	magnetic
→ paper	→ iron
→ plastic	→ steel *

* Steel = mixture

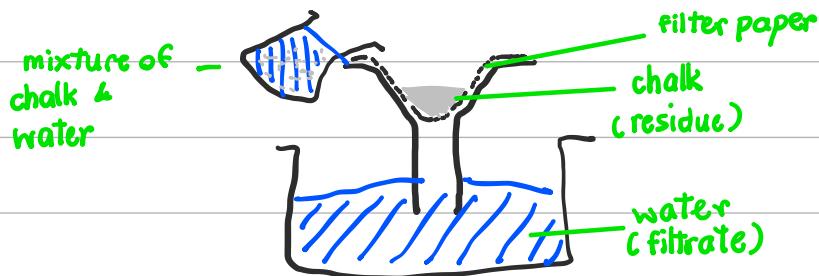
How things work:

✓	magnetic + non-magnetic
✗	magnetic + magnetic
✗	non-magnetic + non-magnetic

Example of usage : - scrapyard

FILTRATION

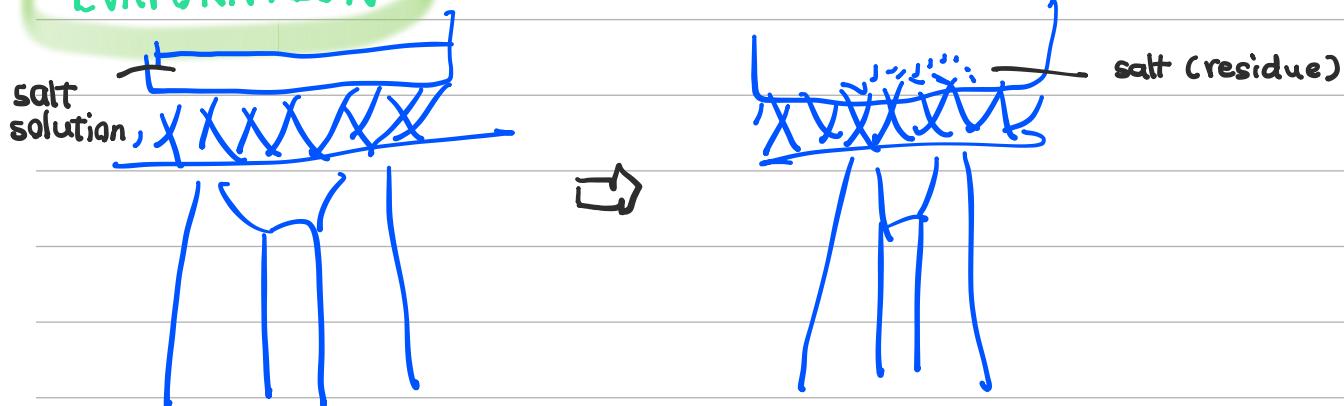
* use SIEVE / FILTER PAPER



Examples of usage / filters :

- tea strainer
- sand & rocks
- nose
- aircon filter
- water filter
- kidney
- windpipe

EVAPORATION



suspension

* insoluble in liquid → filtration

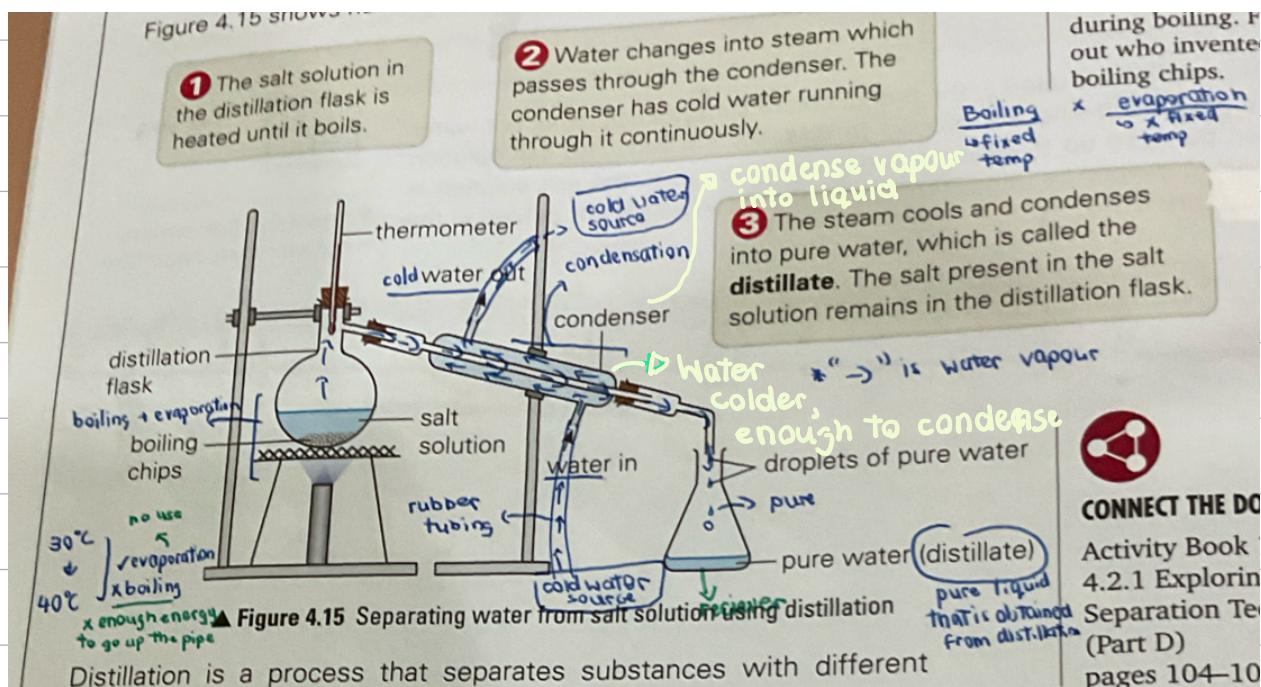
soluble in liquid
solution → evaporation

Examples : - Preserve food

- Get salt

Solutions → x filtration

Distillation



* Boiling chips \rightarrow porcelain chips

\hookleftarrow tube \times shake sm during boiling

* Why cold water flow from opposite direction?

Same direction : Gravity \rightarrow water flow faster



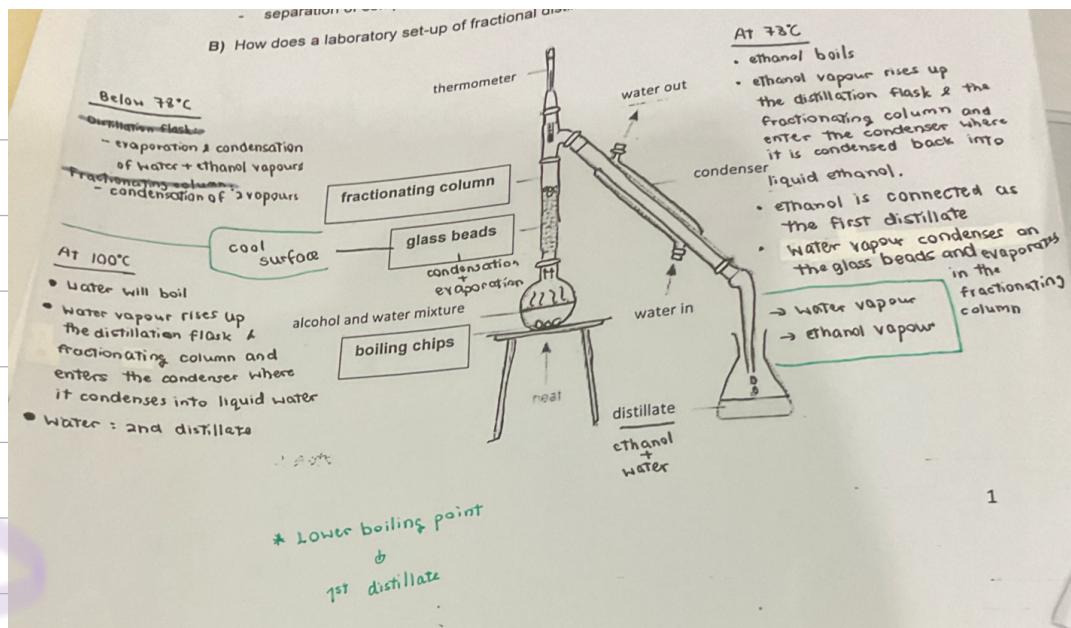
\times fill up condenser

* Thermometer : \rightarrow measure temp of vapour

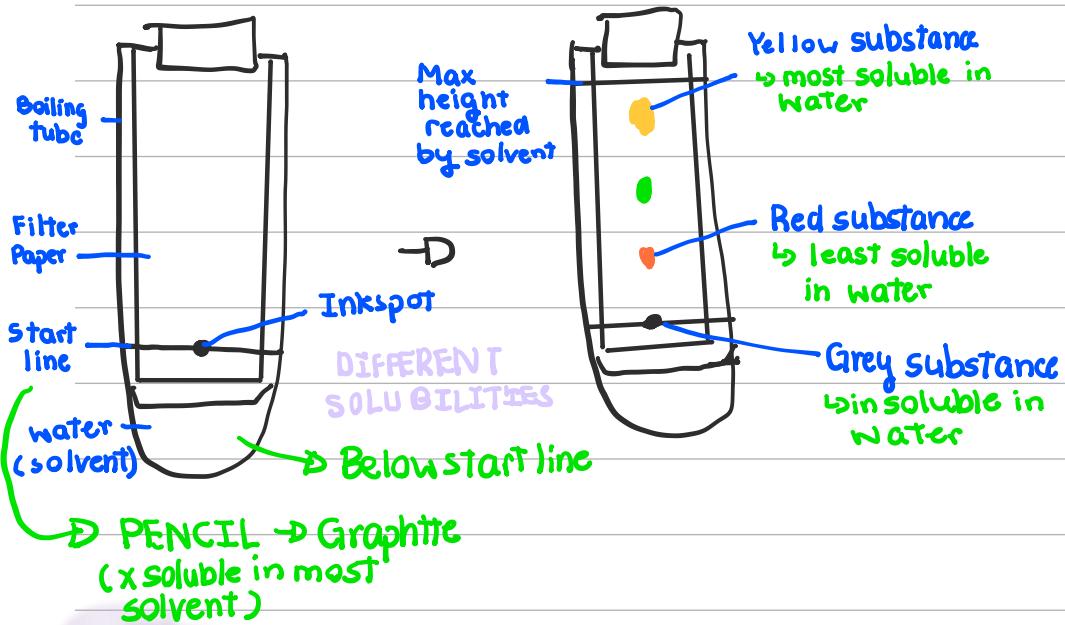
\rightarrow measure boiling point of liquid being distilled

Examples : - Perfume

- Distilled water
 - Food flavourings (citrus oil)
 - Desalination
- \hookleftarrow distillation of seawater

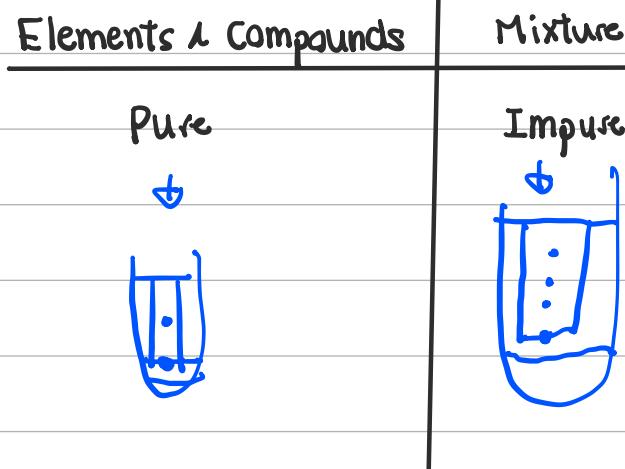


CHROMATOGRAPHY



* SOLUBILITY

RATE OF DISSOLVING



Examples :

- Identify colours in dyes
- Identify coloured substances in food
- Detect water pollutants