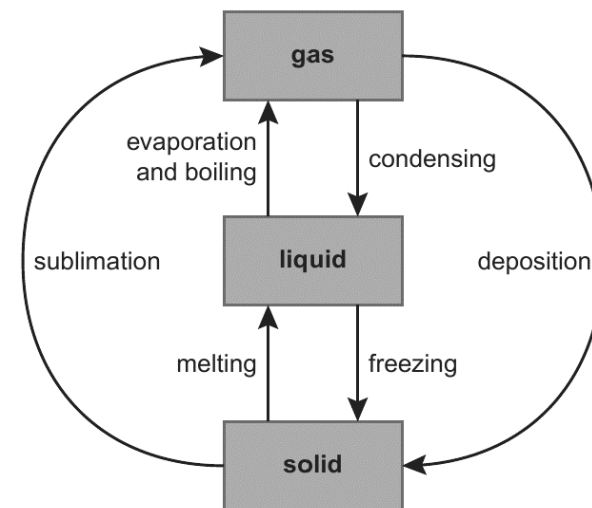


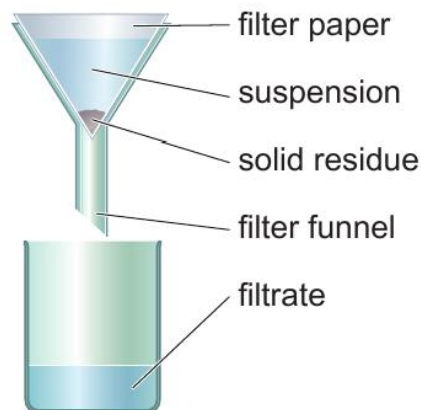


- 1 There are 3 states of matter: solid, liquid and gas.
- 2 Substances can change state. A state change is a physical change, the chemical properties of the substance do not change.
- 3 Attractive forces between particles need to be overcome when a substance changes from a solid-liquid-gas
- 4 When substances cool down these attractive forces are formed so the substance condenses such as when something freezes.
- 5 A mixture contains elements and/or compounds that are not chemically joined together.
- 6 Filtration is the process of separating insoluble substances from a liquid.
- 7 Crystallisation is the process of separating a solute from a solution by evaporating the solvent.

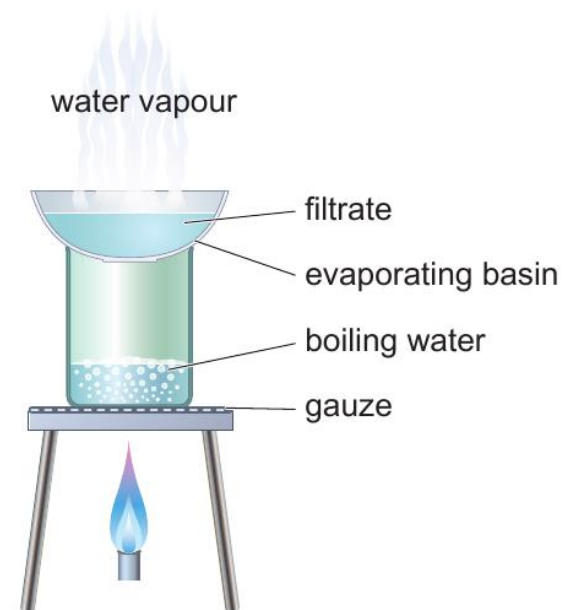


State	Particle diagram	Arrangement of particles	Movement of particles
Gas		random far apart	fast in all directions
Liquid		random close together	move around each other
Solid		regular close together	vibrate about fixed positions

## Filtration



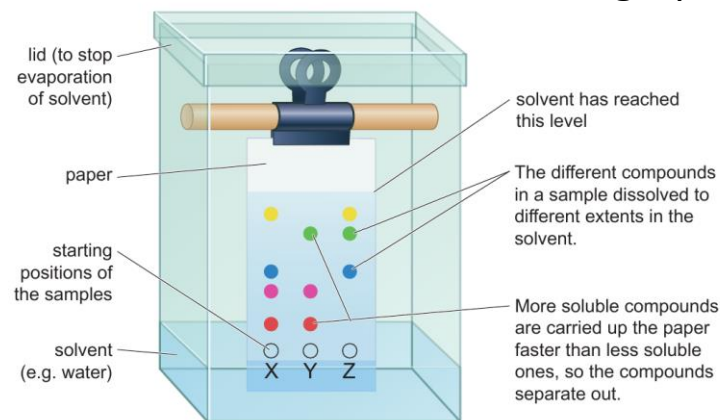
## Crystallisation



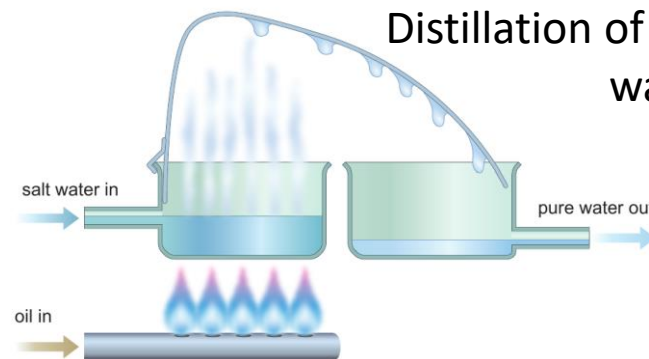


- |   |                                                                                                                                                                                |
|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Chromatography is the process used to separate inks, paints and foods (fig.2).                                                                                                 |
| 2 | Rf values are the distance a compound has risen divided by the distance a solvent has risen.<br>$R_f = \frac{\text{distance moved by spot}}{\text{distance moved by solvent}}$ |
| 3 | Simple distillation is the process of separating two liquids with two different boiling points (fig.3)                                                                         |
| 4 | Fractional distillation is the process of separating two or more liquids.                                                                                                      |
| 5 | Fractional distillation can be used to separate different products in crude oil, making alcoholic drinks such as whisky and vodka and separating gases in air.                 |
| 6 | Sea water can be purified by heating, the vapour is then cooled and condensed forming water without dissolved salts.                                                           |
| 7 | Chemical analysis involves using chemical reactions or sensitive machines to identify and measures the amounts of substances in a sample.                                      |
| 8 | Drinking water comes from rivers, lakes or aquifers.                                                                                                                           |
| 9 | The process of producing drinking water involves:<br>Sedimentation-filtration-chlorination                                                                                     |

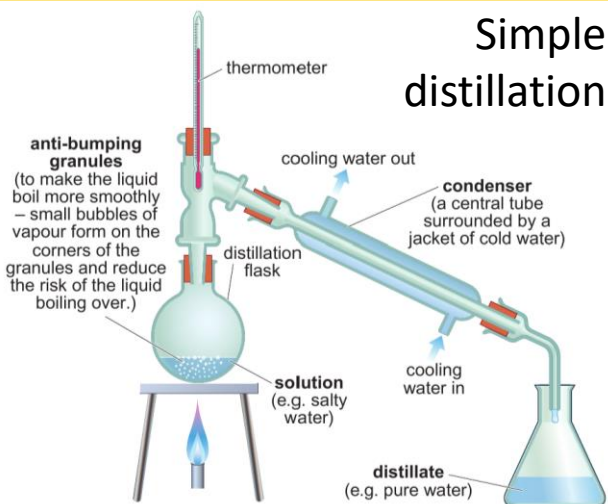
## Chromatography



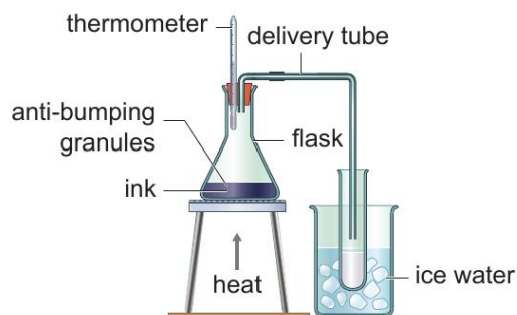
## Distillation of sea water



## Simple distillation



## A simple still



## Treating drinking water

