

PRACTICALS REVISION (C7)

PRACTICAL KEYWORDS

- Accurate – close to the true value (repeat measurements and calculate the mean, repeat using different equipment)
- Fair test – all control variables are kept the same
- Outlier – a result that is different from the rest. These should be ignored when calculating mean values
- Precise – similar results (spread of data is small)
- Resolution – smallest change in a quantity that gives a change in reading
- Repeatable – similar results obtained by the same person and the same equipment
- Reproducible – similar results are obtained by different people and different equipment
- Uncertainty – the doubt in a reading caused by the equipment used

SOURCES OF ERROR

- Random errors – caused by changing conditions or equipment. To reduce these repeat the experiment and calculate a mean
- Systematic errors – could be caused by a faulty piece of equipment or a problem with your method e.g. heat loss in a calorimetry method

RECORDING RESULTS CORRECTLY

In a table:

- Independent variable (what you change) in the left hand column
- Dependent variable (what you measure) in the right hand column
- Units need to be in the column headings

PLOTTING A GRAPH CORRECTLY

- Independent variable (what you change) on the x axis
- Dependent variable (what you measure) on the y axis
- Axes need to be labelled and include units
- Choose a scale which is linear and takes up over half the space available

- Continuous variables (can be any value) should be plotted using a line graph
- Discrete (has whole number values e.g. shoe size) and categorical (described by labels e.g. colour) variables should be plotted using a bar graph

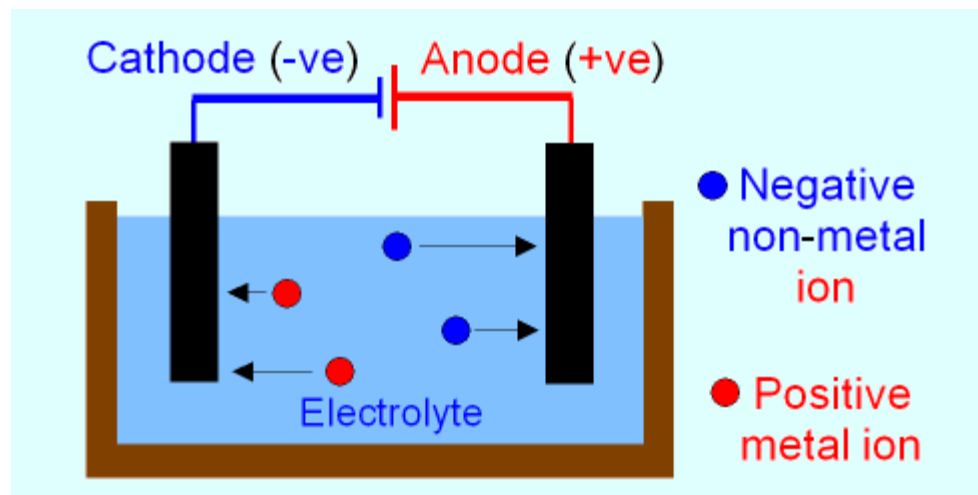
PRACTICAL SKILLS – REQUIRED PRACTICALS

- **C2 Electrolysis** – practical set-up of a electrolysis cell
- **C3 Separation techniques** – paper chromatography and measuring R_f values
- **C4 Distillation** – simple distillation e.g. purifying water
- **C7 Production of salts** – making a soluble salt, making an insoluble salt

PRACTICAL SKILLS – REQUIRED PRACTICALS

• C2 Electrolysis

– practical set-up of a electrolysis cell

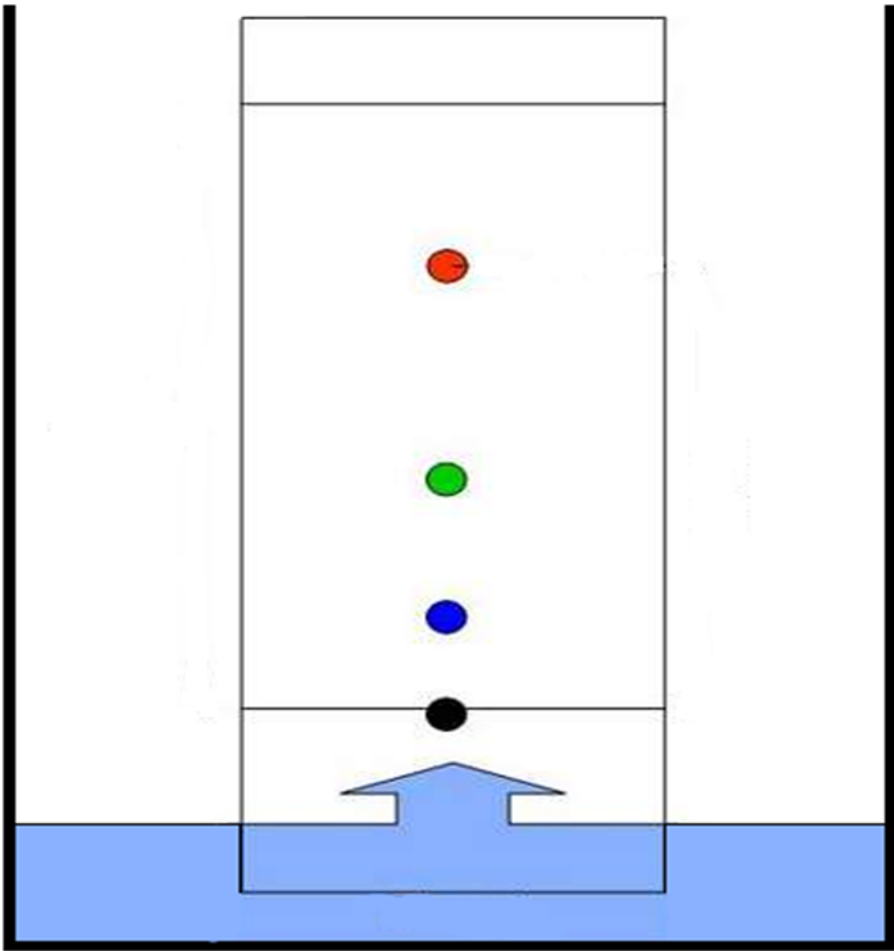


- PANIC (positive anode negative is cathode)
- Positive ions (metal or hydrogen) go to the cathode where they gain electrons (reduction)
- Negative ions (non-metals) go to the anode where they lose electrons (oxidation)
- OILRIG (oxidation is loss, reduction is gain (of electrons))

PRACTICAL SKILLS – REQUIRED PRACTICALS

- **C3 Separation techniques** – paper chromatography and measuring R_f values

CHROMATOGRAPHY

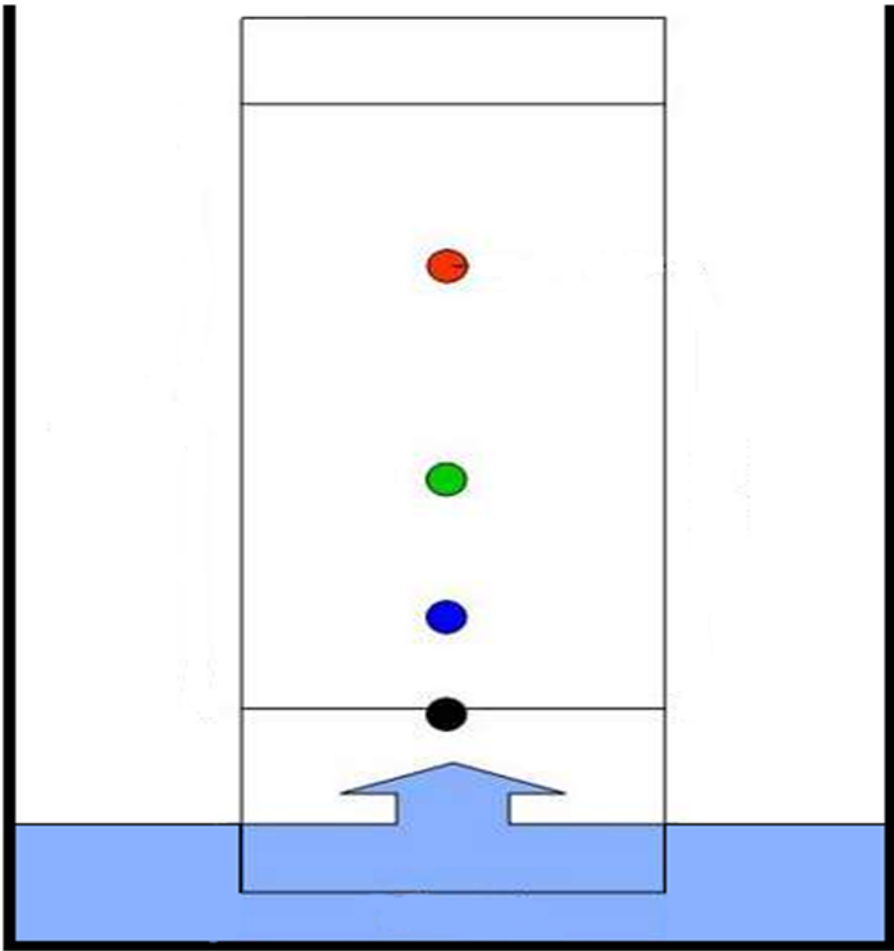


Chromatography lets us **separate** inks and dyes or other substances dissolved in water

As the **solvent** (water) rises through the paper it **dissolves** the sample mixture, which will then **travel** up the paper.

Some particles travel **further** than other particles, due to the differences in **solubility** and their **attractions** with the paper. The number of spots indicates the number of chemicals in the sample (do not include the one on the baseline)

CHROMATOGRAPHY



Possible problems:

Baseline drawn in ink – ink will dissolve in the solvent

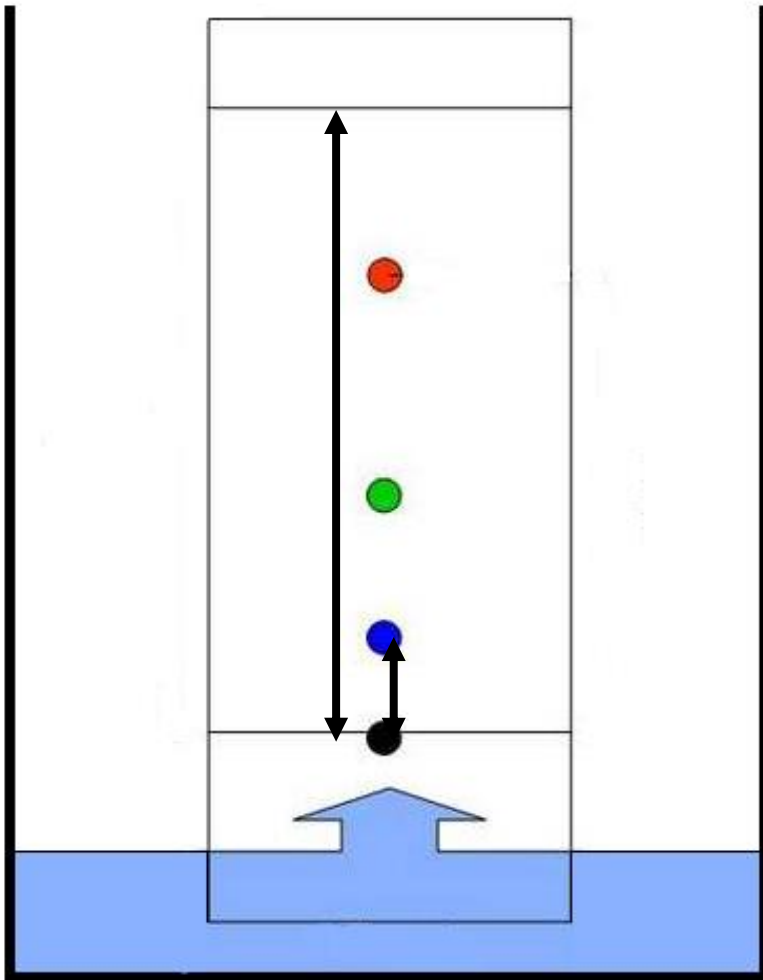
Solvent level above the baseline – sample will dissolve in the solvent and not separate

Sample not soluble in the chosen solvent – spot will stay on the baseline

Left too long and solvent reaches the top of the paper – spots may squash together again

Colourless components – will not be seen

CALCULATING R_f VALUES



$$R_f = \frac{\text{distance from the base line to the spot}}{\text{distance from the base line to the solvent front}}$$

For the blue dot:

Step 1:

Measure the distance from the base line to the dot.

Step 2:

Measure the distance from the base line to the top line.

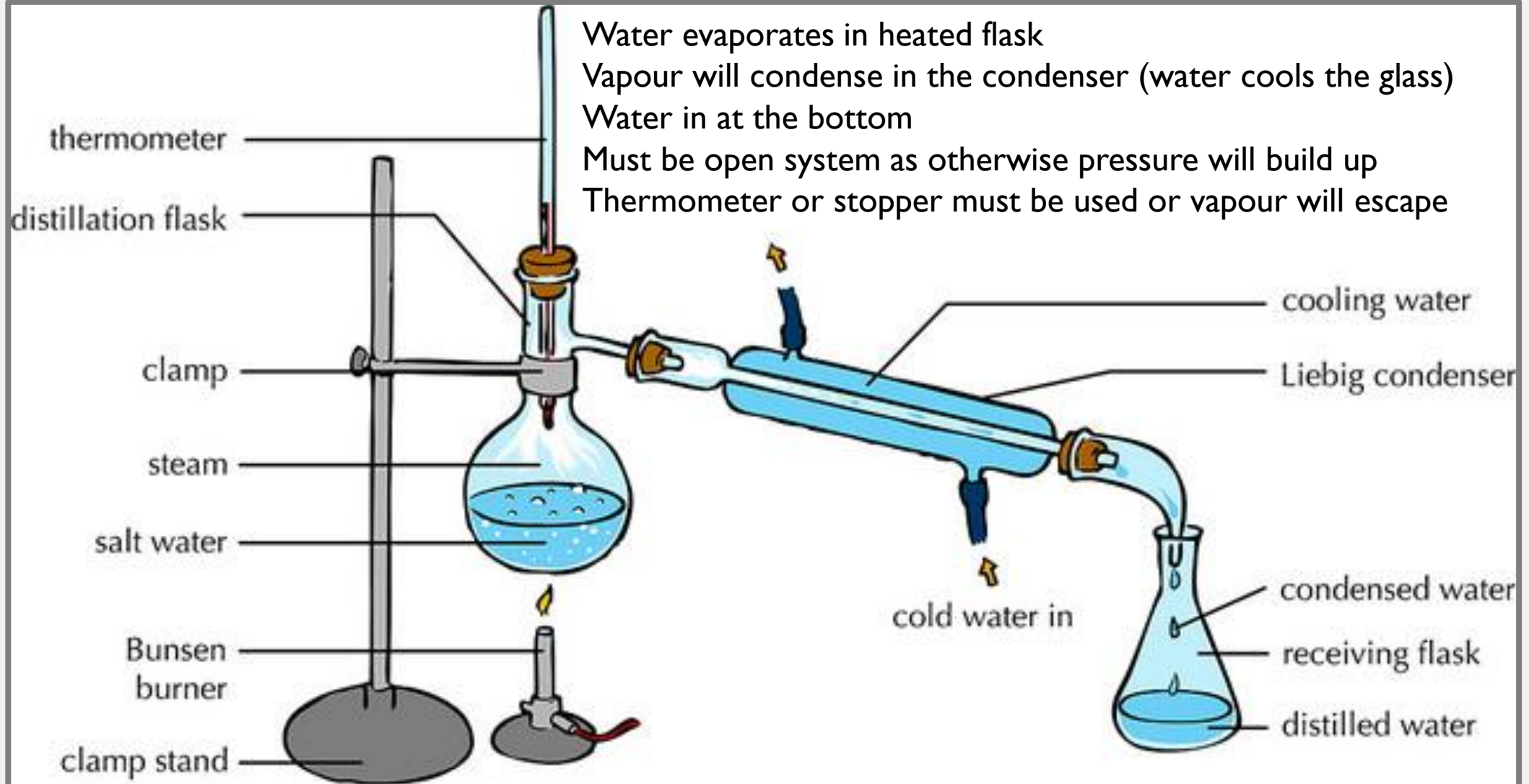
Step 3:

Use the equation above and calculate the R_f value

PRACTICAL SKILLS – REQUIRED PRACTICALS

- **C4 Distillation** – simple distillation e.g. purifying water

DISTILLATION



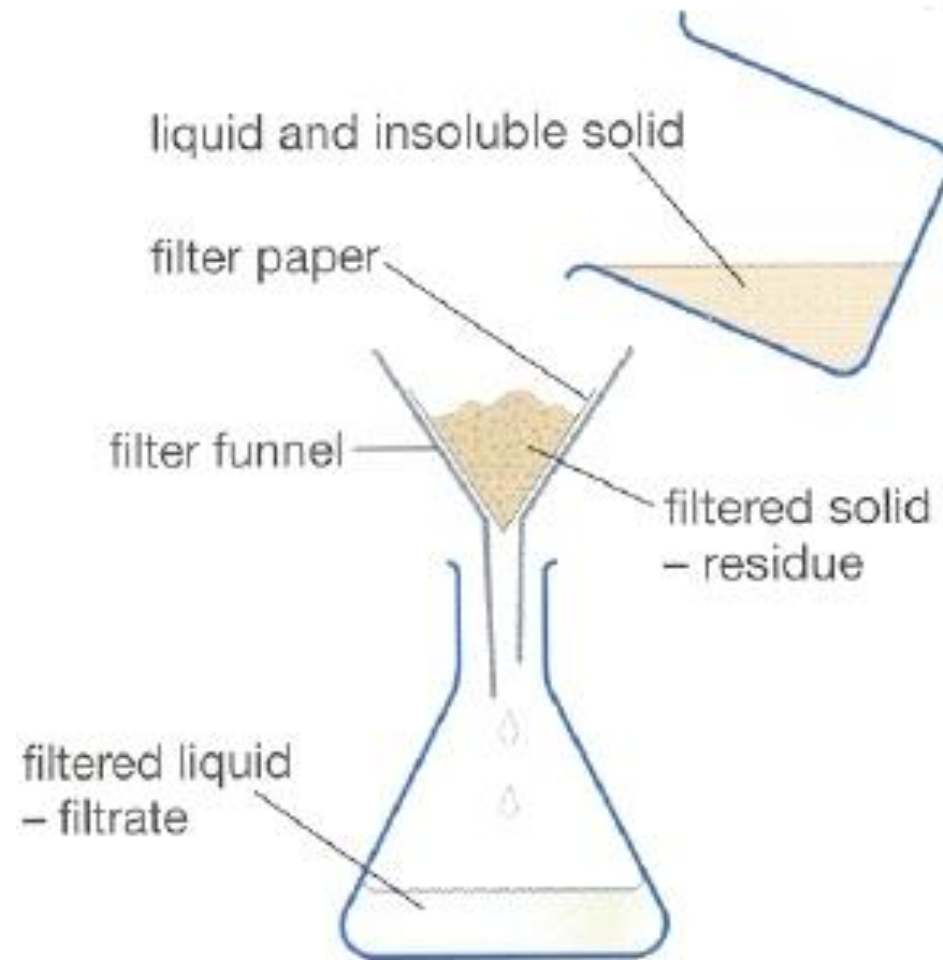
PRACTICAL SKILLS – REQUIRED PRACTICALS

- **C7 Production of salts** – making a soluble salt, making an insoluble salt

Soluble salts

- Mix the reactants, filter out any insoluble solids
- Collect the filtrate (solution)
- Evaporate the solvent to give a saturated solution
- Leave the solution to crystallise
- Filter and collect the crystals
- Wash the crystals with cold solvent
- Dry the crystals overnight

FILTRATION



PRACTICAL SKILLS – REQUIRED PRACTICALS

- **C7 Production of salts** – making a soluble salt, making an insoluble salt

Insoluble salts

- Mix the reactants
- Filter and collect the solid (residue)
- Wash the solid with cold solvent
- Dry the solid overnight