Edexcel IGCSE Chemistry

Topic 2: Inorganic chemistry

Acids, alkalis and titrations

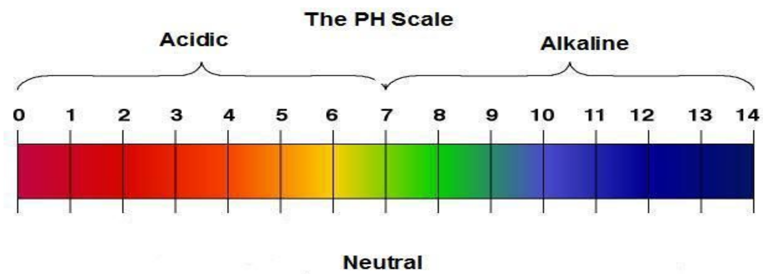
Notes

2.28 describe the use of litmus, phenolphthalein and methyl orange to distinguish between acidic and alkaline solutions

- Phenolphthalein
  - Alkaline = pink
  - Acidic = colourless
- Methyl orange
  - Alkaline = yellow
  - Acidic = red
- Litmus
  - Litmus solution
    - Alkaline = blue
    - Acidic = red
  - Litmus paper
    - Blue litmus paper goes red in acidic & stays blue in alkaline
    - Red litmus paper goes blue in alkaline & stays red in acidic

2.29 understand how to use the pH scale, from 0-14, can be used to classify solutions as strongly acidic (0-3), weakly acidic (4-6), neutral (7), weakly alkaline (8-10) and strongly alkaline (11-14)

- The pH scale (0 to 14) measures the acidity or alkalinity of a solution, and can be measured using universal indicator of a pH probe
  - pH 7 is neutral
  - < pH 7 is acidic (the closer to 0, the stronger the acid)
  - > pH 7 is alkaline (the closer to 14, the stronger the alkali)



2.30 describe the use of universal indicator to measure the approximate pH value of an aqueous solution

- add a couple of drops of solution to a piece of universal indicator paper and observe what colour it goes (compare to pH scale)

2.31 know that acids in aqueous solution are a source of hydrogen ions and alkalis in an aqueous solution are a source of hydroxide ions

- Acids produce H^+ ions in aqueous solutions
- Alkalis produce OH^- ions in aqueous solutions

2.32 know that alkalis can neutralise acids

- A neutralisation reaction is one between an acid and a base
- the ionic equation for any alkali-acid neutralisation reaction is:
  $H^+(aq) + OH^-(aq) \rightarrow H_2O(l)$

2.33 (chemistry only) describe how to carry out an acid-alkali titration

How to carry out a titration:
1. Wash burette using acid and then water
2. Fill burette to $100cm^3$ with acid with the meniscus' base on the $100cm^3$ line
3. Use $25cm^3$ pipette to add $25cm^3$ of alkali into a conical flask, drawing alkali into the pipette using a pipette filler
4. Add a few drops of a suitable indicator to the conical flask (eg: phenolphthalein which is pink when alkaline and colourless when acidic)
5. Add acid from burette to alkali until end-point is reached (as shown by indicator)
6. The titre (volume of acid needed to exactly neutralise the acid) is the difference between the first ($100cm^3$) and second readings on the burette)
7. Repeat the experiment until you get concordant results