Your notes

KS3 Science: revision notes

C2.1 Acids and alkalis

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The pH scale

- **Acids** have a pH below 7: hydrochloric **acid**, sulfuric **acid**, nitric acid, citric acid (in lemons) and ethanoic acid (in vinegar).
- **Alkalis** have a pH above 7: sodium hydroxide, soap and oven cleaner. Pure water is **neutral**, with a pH of 7.
- The further from 7, the stronger the **acid** or **alkali**. Strong **acids** and alkalis are corrosive, so wear eye protection.

Indicators

- **Indicators** change colour depending on pH. Litmus turns red in **acids** and blue in **alkalis**.
- **Universal indicator** shows the pH: red, orange or yellow for **acids**; green for **neutral**; blue or purple for alkalis. Red cabbage juice can be used as an indicator too.
- A pH probe (meter) gives a more accurate reading than an **indicator**.

Neutralisation and salts

- **Acid** + **alkali** → **salt** + water. For example, hydrochloric acid + sodium hydroxide → sodium chloride + water.
- The first part of a **salt**'s name comes from the metal; the second part comes from the **acid**: hydrochloric **acid** makes chlorides, sulfuric acid makes sulfates and nitric acid makes nitrates.
- Uses of **neutralisation**: indigestion tablets neutralise extra stomach **acid**, and farmers spread lime to neutralise acidic soil.

Acids and metal carbonates

- **Acid** + **metal carbonate** → **salt** + water + carbon dioxide. You see fizzing as the gas is given off.
- For example, hydrochloric **acid** + calcium carbonate → calcium chloride + water + carbon dioxide.
- Test for carbon dioxide: bubble it through **limewater**, which turns milky (cloudy).
- To make a **salt**: warm the **acid**, add the solid **metal carbonate** or oxide until no more reacts (excess), filter off the extra solid, then evaporate some water and leave the solution to crystallise. Write methods as numbered steps with equipment, amounts and safety.

Key terms

Acid	A substance with a pH below 7.
Alkali	A substance that dissolves in water and has a pH above 7.
Neutral	Neither acidic nor alkaline; pH 7.
pH scale	A scale from 0 to 14 showing how acidic or alkaline a solution is.
Indicator	A substance that changes colour depending on pH.
Universal indicator	An indicator with a range of colours that show the pH.
Neutralisation	The reaction between an acid and an alkali (or base).
Salt	A compound made when an acid reacts with a metal compound.
Corrosive	Can destroy living tissue and other materials.
Metal carbonate	A compound such as calcium carbonate that fizzes with acid.
Limewater	A solution that turns milky when carbon dioxide passes through it.

Quick questions

Cover the answers and test yourself: remembering is what makes it stick.

1. What is the pH of a neutral solution?
2. What colour does universal indicator turn in a strong acid?
3. What colour does litmus turn in an alkali?
4. Which of these is an alkali?
5. What is made when an acid neutralises an alkali?
6. What salt is made from hydrochloric acid and sodium hydroxide?
7. Which acid makes sulfate salts?
8. What gas is made when an acid reacts with a metal carbonate?

Your notes

Answers

1. 7
2. Red
3. Blue
4. Sodium hydroxide
5. A salt and water
6. Sodium chloride
7. Sulfuric acid
8. Carbon dioxide

What to do next

Practise 14 questions on this topic

Try 4 exam questions, with mark schemes

Read the lesson, one step at a time

Free revision for GCSE and KS3 at lycolearn.co.uk. Some notes are for one exam board only, and say so in brackets.

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