

How acids, bases and salts behave

Chemistry grades 9-10 (GCSE · IGCSE · O Level · Class 9-10) · Test

Name: _____ Date: _____ Class: _____ Mark: ____ / 20

This test has eight questions worth 20 marks in total. Write chemical equations carefully, give units where needed and explain in terms of ions where asked. You may use a calculator.

Level: Chemistry grades 9-10 (GCSE · IGCSE · O Level · Class 9-10) · **Curriculum:** GCSE C4, IGCSE 7

Time: 45 minutes · 8 questions · Total: 20 marks · Calculator allowed

Question 1 Acid, base or alkali (2 marks)

- Define an alkali. (1 mark)
- State the pH of a neutral solution and name the ion present in all acids. (1 mark)

Question 2 Carbonate and acid (3 marks)

Sodium carbonate reacts with nitric acid.

- Write the word equation. (1 mark)
- Write the balanced symbol equation. (2 marks)

Question 3 Neutralisation ions (2 marks)

- Write the ionic equation for neutralisation of an acid by an alkali. (1 mark)
- In the reaction of potassium hydroxide with nitric acid, name the two spectator ions. (1 mark)

Question 4 Copper chloride crystals (3 marks)

A student makes copper(II) chloride from copper(II) carbonate and dilute hydrochloric acid.

- State what is seen when the reaction is finished. (1 mark)
- Explain why the mixture is filtered. (1 mark)
- Explain why the filtrate is not heated until it is dry. (1 mark)

Question 5 Strong and weak acids (3 marks)

Hydrochloric acid and ethanoic acid have the same concentration.

- Explain why hydrochloric acid has the lower pH. (2 marks)
- State what the symbol $\rightleftharpoons$ shows for ethanoic acid. (1 mark)

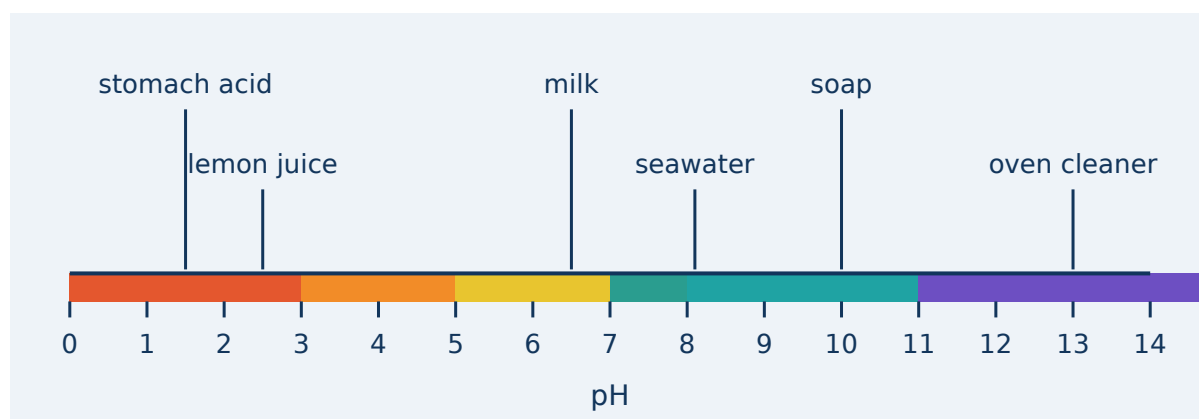
Question 6 pH and hydrogen ions (2 marks)

- Calculate how many times more H^+ ions there are at pH 3 than at pH 5. (1 mark)
- A solution of pH 2 is diluted by adding nine times its volume of water. State the new pH, assuming a strong acid. (1 mark)

Question 7 Reading the pH scale (2 marks)

Use the pH scale of everyday liquids.

- State which liquid is the best choice to neutralise an ant sting and name its pH. (1 mark)
- Calculate how many times more H^+ ions lemon juice has than milk. (1 mark)



pH of six everyday liquids.

Question 8 Antacid tablet (3 marks)

Milk of magnesia contains magnesium hydroxide: $Mg(OH)_2 + 2HCl \rightarrow MgCl_2 + 2H_2O$ (Ar: Mg = 24, O = 16, H = 1, Cl = 35.5).

- Calculate the moles in 2.9 g of $Mg(OH)_2$. (1 mark)
- Calculate the moles of HCl it can neutralise. (1 mark)
- Calculate the mass of $MgCl_2$ formed. (1 mark)