

Section A:

1. Which ion do acids produce in aqueous solutions?

Tick one box.

H⁺

OH⁻

H⁻

2. Which of these is a strong acid?

Tick one box.

Citric acid

Ethanoic acid

Nitric acid

3. Acids react with alkalis. What kind of reaction is this?

Tick one box.

Redox

Combustion

Decomposition

Neutralisation

4. A student has a sample of hydrochloric acid. Which is likely to be the pH?

Tick one box.

pH 3

pH 7

pH 10



Section B

5. A scientist has a sample of concentrated citric acid.
- Citric acid is a weak acid. Explain what this means.

- Explain how an acid can be described as concentrated and weak.

6. Hydrogen chloride dissolves in water to form hydrochloric acid. Hydrogen chloride molecules all ionise in water.

Ethanoic acid also dissolves in water. Only a small fraction of ethanoic acid molecules ionise in water.

- 0.5 g of hydrogen chloride is dissolved in to make 0.5 dm³ of solution. Calculate the concentration of this solution.

- Which correctly describes the solution that has been made?

Tick one box.

A concentrated solution of strong acid

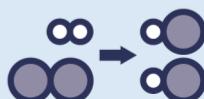
A dilute solution of strong acid

A concentrated solution of weak acid

A dilute solution of weak acid

- Explain how the concentration of the solution could be increased without changing the amount of acid.

- Which of these solutions would have the lowest pH?



Tick one box.

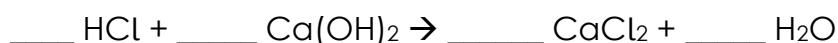
0.5 mol/dm³ hydrochloric acid solution

0.5 mol/dm³ ethanoic acid solution

2.0 mol/dm³ hydrochloric acid solution

2.0 mol/dm³ ethanoic acid solution

Hydrochloric acid reacts with calcium hydroxide. This reaction can be represented with the following equation.



e. Balance this equation.

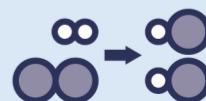
f. Name the salt produced in this reaction.

g. Calculate the mass of salt made when 84 g of calcium hydroxide reacts with excess acid.

h. **This question is for Chemistry only.**

Ethanedioic acid ($\text{H}_2\text{C}_2\text{O}_4$) is a solid that can be dissolved to make a solution. Calculate the mass of ethanedioic acid required to produce 150 cm³ of solution with a concentration of 0.2 mol/dm³.

7. Explain the factors that affect the pH of an acid.



Section C

8. A scientist has added sulfuric acid to water in a beaker.

 - Is this solution a compound or a mixture? Explain your answer.
 - Describe and explain a method the scientist could use to separate the water from the acid different acid solutions.
 - Is sulfuric acid a strong acid or a weak acid? Explain your answer.
 - State the chemical formula for sulfuric acid.
 - Calculate the relative formula mass for sulfuric acid.
 - Calculate the percentage by mass of hydrogen in sulfuric acid.
 - Is sulfuric acid solution likely to conduct electricity? Explain your answer.

