

10.1 Water

Name: _____ Class: _____ Date: _____

Total: 9 marks**KEY WORDS** water 水 • anhydrous 无水 • carbon 碳 • microbes 微生物 • nitrates 硝酸盐

Objective

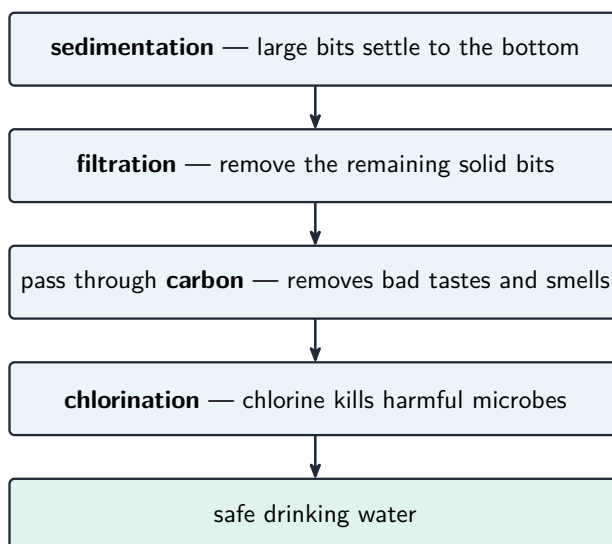
Build the skills to answer exam questions on **water** 水 — testing for water and for purity, what natural water contains, and **water treatment** 水处理.

You must be able to:

- give the chemical tests for water and the tests for purity
- describe what is in natural water (helpful and harmful)
- describe the steps in treating drinking water

1 Worked examples

■ Testing and treating water



Treatment: settle, filter, remove tastes with carbon, then chlorinate to kill microbes

- **test for water:** anhydrous copper(II) sulfate white→blue; cobalt(II) chloride blue→pink.
- **test for purity:** pure water melts at 0 °C and boils at 100 °C.

2 Practice

2.1 A student is given a colourless liquid and a strip of dry cobalt(II) chloride paper. Describe what she would see if the liquid contains water, and state what this test does **not** tell her. [2]

2.2 State the role of chlorine in water treatment. [1]

3 Exam-style questions

3.1 To show that a sample of water is **pure**, you would: [1]

- **A** add cobalt(II) chloride
- **B** check it boils at exactly 100 °C
- **C** filter it
- **D** add chlorine

3.2 Drinking water is treated in steps.

(a) State the purpose of passing the water through carbon. [1]

(b) Explain why nitrates in natural water can be harmful to aquatic life. [2]

3.3 Explain why distilled water, not tap water, is used in chemistry experiments. [2]

Solutions

2.1 The paper turns from blue to pink; the test shows only that water is present, not that the liquid is pure water, so it cannot distinguish pure water from a solution.

2.2 it kills harmful microbes.

3.1 B. Pure water boils at exactly 100 °C (impurities change this).

3.2 (a) it removes bad tastes and smells.

(b) nitrates cause deoxygenation (loss of oxygen) in the water; so aquatic life cannot get enough oxygen.

3.3 tap water contains dissolved impurities; these could interfere with reactions, whereas distilled water has far fewer impurities.