

## 9.3 Alloys and their properties

Name: \_\_\_\_\_ Class: \_\_\_\_\_ Date: \_\_\_\_\_

**Total: 10 marks****KEY WORDS** alloy 合金 • brass 黄铜 • carbon 碳 • mixture 混合物 • stainless steel 不锈钢

### Objective

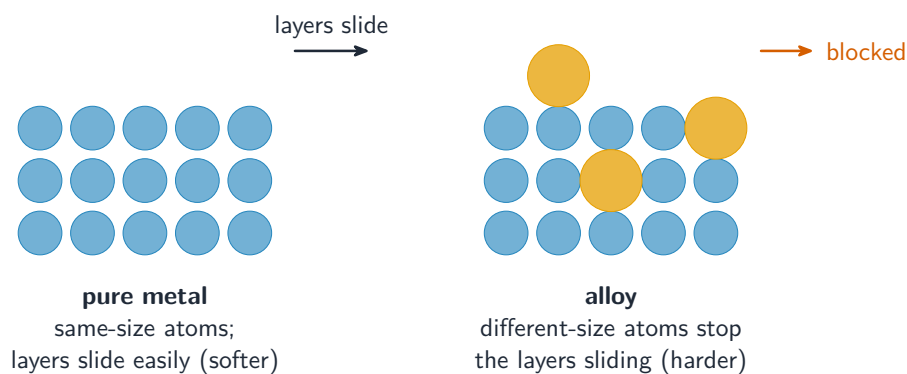
Build the skills to answer exam questions on **alloys** 合金 — what they are, examples, and why they are harder than pure metals.

**You must be able to:**

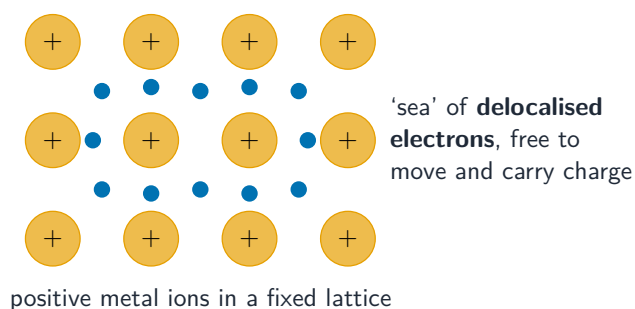
- define an alloy and give examples (brass, stainless steel)
- explain why alloys are harder than pure metals
- link the property to a use

### 1 Worked examples

#### ■ Why alloys are harder



*Different-sized atoms stop the layers sliding, so the alloy is harder than the pure metal*



*Alloying distorts the metallic lattice, changing properties*

- **alloy:** a mixture of a metal with other element(s).
- **brass** = copper + zinc; **stainless steel** = iron + chromium/nickel/carbon.

## 2 Practice

2.1 Define an alloy. [1]

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2.2 Name the two metals in brass. [2]

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## 3 Exam-style questions

3.1 Alloys are usually harder than pure metals because the different-sized atoms: [1]

- |   |   |
|---|---|
| A | B |
| C | D |
- A** are more reactive
  - B** stop the layers sliding over each other
  - C** make the metal lighter
  - D** conduct better

**3.2** Stainless steel is used for cutlery.

(a) Name two elements (other than iron) found in stainless steel. [2]

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(b) State two properties that make it suitable for cutlery. [2]

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**3.3** Explain, using their structures, why an alloy is harder than the pure metal it is made from. [2]

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