

9.1 Properties of metals

Name: _____ Class: _____ Date: _____

Total: 9 marks

Objective

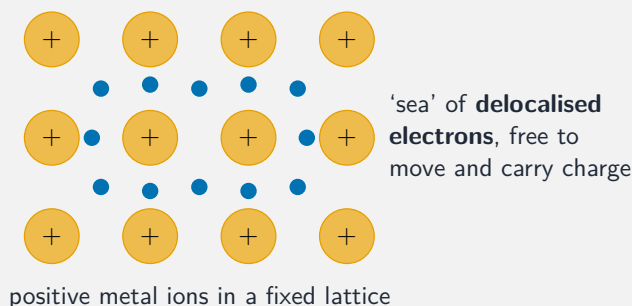
Build the skills to answer exam questions on the **properties of metals** 金属的性质—physical properties vs non-metals, and the chemical reactions of metals.

You must be able to:

- contrast the physical properties of metals and non-metals
- give the products of metals with acids, water/steam and oxygen
- link properties to uses

1 Worked examples

■ Metal properties



Delocalised electrons make metals good conductors; sliding layers make them malleable

most reactive		
	K	potassium
	Na	sodium
	Ca	calcium
	Mg	magnesium
	Al	aluminium
	C	carbon (non-metal)
	Zn	zinc
	Fe	iron
	H	hydrogen (non-metal)
	Cu	copper
	Ag	silver
	Au	gold
least reactive		

above carbon:
extract by **electrolysis**

below carbon:
extract by **reduction with carbon**

- **metals:** good conductors, malleable/ductile, high melting points.
- **reactions:** + acid → salt + hydrogen; + oxygen → metal oxide; + water/steam → hydroxide/oxide + hydrogen.

2 Practice

2.1 State two physical properties of metals. [2]

2.2 Give the products when a metal reacts with a dilute acid. [1]

3 Exam-style questions

3.1 Which property is typical of a non-metal? [1]

- **A** good electrical conductor
- **B** malleable
- **C** brittle
- **D** high density

3.2 Magnesium reacts with dilute hydrochloric acid.

(a) Name the two products. [2]

(b) Name the gas given off and a test for it. [2]

3.3 State why metals are good electrical conductors. [1]

4 Go further

You are now ready for the real exam questions on this subtopic. Open the **9.1 Properties of metals** past-paper sheet in the Library, or try these in **Practice mode**:

- 0620/41 N25 —Q2 (properties of metals)
- 0620/43 N25 —Q5 (metals and non-metals)

Solutions

2.1 any two of: good conductor of heat/electricity; malleable; ductile; high melting point.

2.2 a salt + hydrogen.

3.1 C. Non-metals are usually brittle.

3.2 (a) magnesium chloride; hydrogen.

(b) hydrogen; it gives a 'squeaky pop' with a lighted splint.

3.3 they have delocalised (free) electrons that can move and carry charge.