

9.1 Properties of metals

Name: _____ Class: _____ Date: _____

Total: 9 marks

KEY WORDS oxygen 氧气 • metals 金属 • oxide 氧化物 • salt 盐 • hydrogen 氢气

Objective

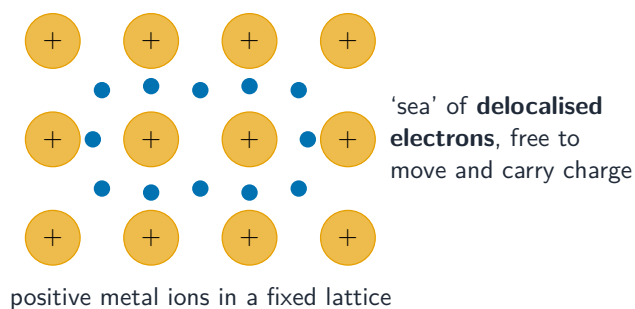
Build the skills to answer exam questions on the **properties of metals** 金属的性质 — physical properties vs non-metals, and the chemical reactions of metals.

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	above carbon: extract by electrolysis
	Al	aluminium	
	C	carbon (non-metal)	
	Zn	zinc	
	Fe	iron	
	H	hydrogen (non-metal)	below carbon: extract by reduction with carbon
	Cu	copper	
	Ag	silver	
	Au	gold	
least reactive			

Reactivity is a key chemical property of a metal

- **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
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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]

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.