IGCSE CHEMISTRY • EXERCISE SHEET

8.2 Group I properties

Name: _____ Class: _____ Date: _____ **Total: 8 marks**

KEY WORDS sodium 钠 • melting point 熔点 • potassium 钾 • density 密度 • reactivity 活泼性

Objective

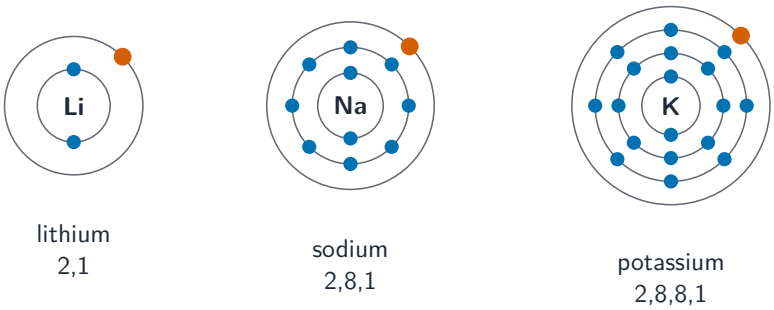
Build the skills to answer exam questions on **Group I — the alkali metals** 碱金属 — their properties, **trends** 趋势 down the group, and reaction with water.

You must be able to:

- describe the alkali metals (soft, one outer electron)
- state the trends in melting point, density and reactivity down the group
- predict the properties of an unfamiliar Group I element

1 Worked examples

Trends down Group I



every Group I atom has **one** electron in its outer shell (shown in orange), so they react in similar ways

Every Group I atom has one outer electron — why they react similarly

Down Group I: melting point decreases, density increases, reactivity increases

- react with water → metal hydroxide + hydrogen (more violent down the group).

2 Practice

2.1 State the number of outer-shell electrons in a Group I atom. [1]

2.2 State the trend in reactivity going down Group I. [1]

3 Exam-style questions

3.1 Going down Group I, the melting point: [1]

- **A** increases
- **B** decreases
- **C** stays the same
- **D** increases then decreases

3.2 Rubidium is below potassium in Group I.

(a) Predict how its reactivity compares with potassium. [1]

(b) Predict how its melting point compares with potassium. [1]

3.3 Sodium reacts with water.

(a) Name the two products. [2]

(b) Explain why potassium reacts more violently than sodium. [1]

Solutions

2.1 one.

2.2 reactivity increases.

3.1 B. Melting point decreases down Group I.

3.2 (a) more reactive than potassium.
(b) lower melting point than potassium.

3.3 (a) sodium hydroxide; hydrogen.
(b) reactivity increases down the group, so potassium is more reactive than sodium.