

8.1 Arrangement of elements

Name: _____ Class: _____ Date: _____

Total: 7 marks

KEY WORDS periodic table 周期表 • elements 元素 • groups 族 • ions 离子 • electrons 电子

Objective

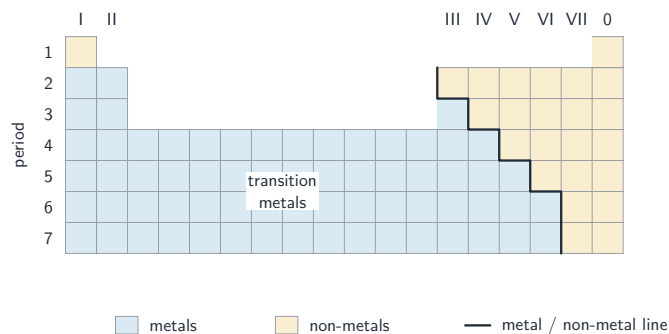
Build the skills to answer exam questions on the **arrangement of elements** 元素排列 — order, **groups** 族 and **periods** 周期, and using position to predict properties.

You must be able to:

- describe the order (increasing proton number) and what groups/periods are
- link group number to ion charge and outer electrons
- explain why elements in a group have similar properties

1 Worked examples

■ Reading the Periodic Table



Groups = columns, periods = rows; metals on the left, non-metals on the right



Trends in properties across groups and periods

- order = increasing proton number.
- group number = outer-shell electrons = ion charge** (Group I $\rightarrow +1$, Group VII $\rightarrow -1$).
- same group $\rightarrow$ same outer electrons $\rightarrow$ similar properties.

2 Practice

2.1 State what the elements are arranged in order of. [1]

2.2 State the charge of the ion formed by a Group II element. [1]

3 Exam-style questions

3.1 Elements in the same group have similar chemical properties because they have the same: [1]

- A number of shells
- B number of outer-shell electrons
- C mass number
- D number of neutrons

3.2 An element is in Group VII, Period 3.

(a) State the number of outer-shell electrons it has. [1]

(b) State the charge of the ion it forms. [1]

3.3 Explain how the Periodic Table lets you predict an element's properties. [2]

Solutions

2.1 increasing proton number (atomic number).

2.2 +2.

3.1 B. Same number of outer-shell electrons gives similar properties.

3.2 (a) 7.

(b) -1.

3.3 elements in the same group have similar properties; so from its position you can predict how it reacts and trends in its group.