

Exercise walk-through

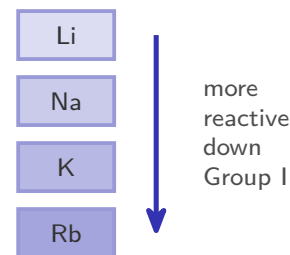
8.4

Transition elements

IGCSE Chemistry

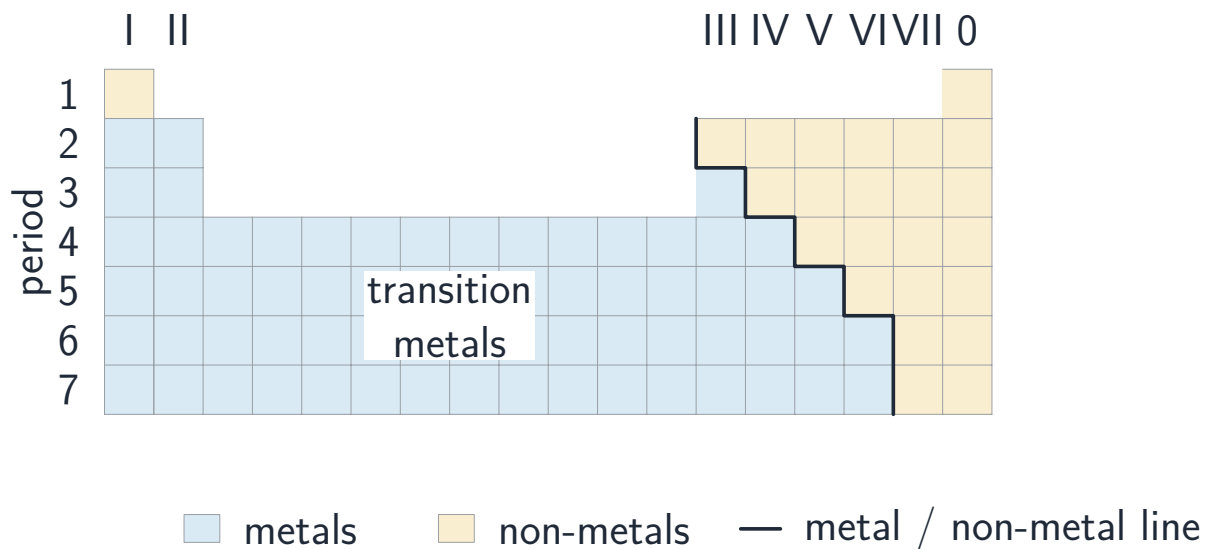
What we will cover

- 1 How the elements are arranged
- 2 Group I – alkali metals
- 3 Group VII – halogens
- 4 Group trends & displacement
- 5 Transition elements
- 6 Group VIII – noble gases



group trends

How the elements are arranged, in detail



The group number tells you the charge of the **ions** that the elements form.

Exam tips

- The Periodic Table is ordered by **proton number**. Elements in the same **group** (column) have the same number of outer electrons, so they react in similar ways; **periods** are the rows.
- **Group I** (alkali metals) get *more* reactive going down; **Group VII** (halogens) get *less* reactive going down – opposite trends.
- A more reactive **halogen displaces** a less reactive one from a solution of its salt – for example chlorine displaces bromine.
- **Noble gases** are unreactive because they have a full outer shell. **Transition elements** are hard and dense, form coloured compounds, act as catalysts and have variable oxidation numbers.

Exercises 2.1·2.2

2.1 State one property of transition metals not shared by Group I metals. [1]

2.2 Give the two common oxidation states of iron. [2]

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2.1

- any **one** of: high density / high melting point / coloured compounds / variable oxidation states / catalytic activity
-

2.2 Give the two common oxidation states of iron. [2]

2.2

- **iron(II)** and **iron(III)**

Exercise 3.1

3.1 A student compares element X from Group I with element Y from the transition elements. Which row could be correct? [1]

	X	Y
A	forms a white compound, one oxidation state	forms a coloured compound, several oxidation states
B	forms a coloured compound, several oxidation states	forms a white compound, one oxidation state
C	high density, high melting point	low density, low melting point
D	acts as a catalyst	never acts as a catalyst

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3.1 A

- Group I: white compounds, one oxidation state; transition: **coloured compounds**, several states
- B swaps the two; C and D reverse density/catalysis

Exercise 3.2 (a)

3.2 Compare a transition metal with a Group I metal.

(a) Give two differences in physical properties.

[2]

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[2]

(a)

- transition metals have **higher density**
- and **higher melting points** than Group I

Exercise 3.2 (b)

3.2 Compare a transition metal with a Group I metal.

(b) State one use of transition elements (or their compounds) linked to their special property. [1]

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(b) State one use of transition elements (or their compounds) linked to their special property. [1]

(b)

- used as **catalysts** (e.g. iron in the Haber process)

Exercise 3.3

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3.3

- they have **variable oxidation numbers**