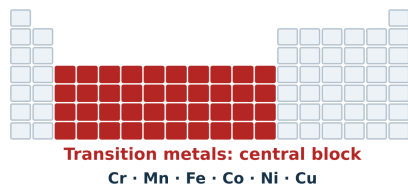


C1 Transition metals

AQA Separate Chemistry 8462 | Paper 1 extras | Foundation + Higher

1 Find the central block



The transition metals lie in the **central block** of the periodic table.
Recognise: **Cr, Mn, Fe, Co, Ni and Cu** (chromium, manganese, iron, cobalt, nickel and copper).

2 Physical properties

Group 1

Lower melting points
Lower densities
Softer and weaker
More reactive

Transition metals

Higher melting points
Higher densities
Harder and stronger
Less reactive

General comparisons between these groups

Compared with Group 1 metals, these transition metals generally have **higher melting points and densities** and are **harder and stronger**.
Both groups conduct heat and electricity.

3 Reactivity

Reaction with cold water

Sodium

Vigorous reaction
with hydrogen gas

Iron

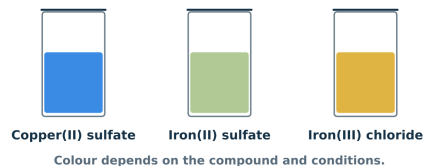
No vigorous reaction
in cold water

Less reactive does not mean unable to react.

Transition metals are generally **less reactive** with oxygen, water and halogens than Group 1 metals.
Example: iron does not react vigorously with cold water like sodium does.
Less reactive $\neq$ unable to react.

4 Coloured compounds

Examples of coloured solutions



Many transition metals form coloured compounds.
Copper(II) sulfate solution: **blue**.
Iron(II) solutions are often pale green.
Colour depends on the particular compound and conditions.

5 Different ion charges



Iron(II): 2+



Iron(III): 3+

Same element, different ion charges

A transition metal can form ions with different charges.
 Fe^{2+} = iron(II)
 Fe^{3+} = iron(III)
The Roman numeral indicates the positive charge. Group 1 forms +1 ions.

6 Catalysts

Iron
Making
ammonia

Nickel
Hydrogenating
oils

MnO_2
Decomposing
 H_2O_2

Faster reactions · Catalyst not used up overall

A catalyst makes a reaction **faster** and is **not used up overall**.
Examples: iron in ammonia production; nickel in hydrogenating oils; manganese dioxide in hydrogen peroxide decomposition.
AQA section 4.1.3.