

# The Reactivity Series and Extraction of Metals

Chapter 3: Metals and Non-metals · Topic 2

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## Key Concept

Extraction methods must match a metal's position in the reactivity series because more reactive metals form more stable compounds, requiring more energy-intensive extraction. For example, aluminium, despite being fairly reactive, is extracted by electrolysis (Hall-Héroult process) since carbon reduction is insufficient for its strongly bonded ore, while iron ore can be reduced using carbon in a blast furnace because iron is less reactive and its oxide bonds are weaker.

## Quick Revision Notes

- The reactivity series ranks metals from most to least reactive.
- Highly reactive metals (Na, K, Ca) are extracted using electrolysis.
- Moderately reactive metals (Fe, Zn) are extracted using carbon reduction.
- Unreactive metals (Au, Ag) are often found in their free (uncombined) state in nature.

## Practice Questions

- 1 Name a metal more reactive than iron and one less reactive.
- 2 Explain why aluminium is extracted using electrolysis rather than carbon reduction.
- 3 Why are unreactive metals like gold often found in their pure form in nature?