

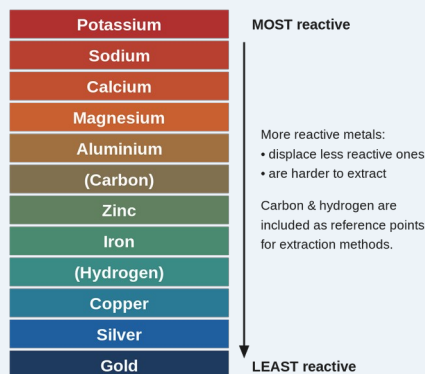
2.4 The Reactivity Series

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1. KEY VOCABULARY

TERM	MEANING
Reactivity series	A list of metals in order of how reactive they are.
Displacement	A more reactive metal pushes a less reactive metal out of its compound.
Oxidation	Loss of electrons (or gain of oxygen).
Reduction	Gain of electrons (or loss of oxygen).
Corrosion	A metal reacting with its surroundings, e.g. rusting.

2. THE SERIES



3. REACTIONS WITH WATER & ACID

With water: only the most reactive metals (K, Na, Ca) react readily with cold water → hydroxide + hydrogen.

With dilute acid: metals above hydrogen react → salt + hydrogen. The more reactive the metal, the faster the fizzing. Copper, silver and gold do not react with dilute acid.

4. DISPLACEMENT REACTIONS

A more reactive metal displaces a less reactive metal from a solution of its salt.

Example: iron + copper sulfate → iron sulfate + copper. The blue solution fades and orange copper coats the iron.

5. OXIDATION & REDUCTION

In displacement: the more reactive metal is oxidised (loses electrons); the metal ion is reduced (gains electrons).

OIL RIG: Oxidation Is Loss, Reduction Is Gain — of electrons.

6. THE WHY

Why a metal displaces another: the more reactive metal holds onto electrons less tightly, so it gives them up to the less reactive metal's ions.

Why the series is useful: it predicts reactions, displacement, and how a metal must be extracted.

7. COMMON EXAM MISTAKES

- ✗ "Copper displaces iron from iron sulfate."
- ✓ Iron is more reactive — iron displaces copper, not the other way round.
- ✗ "Gold reacts with dilute acid."
- ✓ Gold is below hydrogen — it does not react with acid.
- ✗ "Oxidation is gain of electrons."
- ✓ Oxidation Is Loss of electrons (OIL RIG).

8. SELF-CHECK · cover & quiz

Can you...

1. Recall the reactivity series from potassium to gold?
2. Predict whether a displacement reaction will happen?
3. Describe what you see in iron + copper sulfate?
4. Write a word equation for a metal + dilute acid?
5. Define oxidation and reduction in terms of electrons?
6. Explain why a more reactive metal displaces a less reactive one?