

Reactivity series

POEM	NAME	SYMBOL
Popular	Potassium	K
Scientist	Sodium	Na
Can	Calcium	Ca
Make	Magnesium	Mg
A	Aluminium	Al
Zoo	Zinc	Zn
In	Iron	Fe
Low	Lead	Pb
Humid	Hydrogen	H
Country	Copper	Cu
Marvellous	Mercury	Hg
Silver	Silver	Ag
Gold	Gold	Au

Uses displacement reaction

Carbon is used to extract metals such as zinc, lead and copper from their oxides.

Alloys

Pure metals are not usually strong. Their appearance, strength and resistance to corrosion can be improved by mixing with other elements. The mixtures are called alloys.

Reasons for making alloys

Reasons for Making Alloys

- **Increased Strength** – Alloying improves the hardness and durability of metals.
 - *Example: Steel* (Iron + Carbon) is much stronger than pure iron.
- **Improved Corrosion Resistance** – Alloys resist rust and environmental damage better than pure metals.
 - *Example: Stainless Steel* (Iron + Chromium + Nickel) is highly resistant to corrosion.

- **Lower Melting Point** – Some alloys have lower melting points, making them easier to work with.
 - *Example: Solder* (Lead + Tin) melts at a lower temperature than its components.
- **Enhanced Ductility & Malleability** – Alloying can make metals more flexible and easier to shape.
 - *Example: Brass* (Copper + Zinc) is more malleable than pure copper.
- **Better Conductivity** – Certain alloys improve electrical and thermal conductivity.
 - *Example: Nichrome* (Nickel + Chromium) is used in heating elements.
- **Modified Appearance** – Alloying can change the color or texture of metals for aesthetic purposes.
 - *Example: Rose Gold* (Gold + Copper) has a reddish hue.
- **Cost Reduction** – Mixing metals can reduce costs while maintaining desirable properties.
 - *Example: Aluminum Alloys* (Aluminum + Magnesium) are lightweight and cost-effective.
- **Optimized Castability** – Alloys expand upon solidification, making them ideal for casting processes.
 - *Example: Bronze* (Copper + Tin) is widely used in sculptures and machinery.

Revision questions

1. A Piece of magnesium strip was added to a test tube containing copper Sulphate solution.
 - (a) State what was observed.
 - (b) Write an equation for the reaction

2. With reasons explain why alloys are preferable to pure metals in home and industrial use.

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Thanks

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