What Happens When Metals Burn in Oxygen

KS4 CHEMISTRY | CHEMICAL REACTIONS | COMBUSTION | Ages 11-16 | ⏰ 3 min read

Metals Love Oxygen

When a **metal** burns in **oxygen**, something amazing happens. The metal and the oxygen combine together to create a completely new substance called a **metal oxide**. This is a **chemical reaction** — where two things mix and transform into something totally different.

The most common example is **iron** burning in oxygen. When iron gets very hot and there's plenty of oxygen around, the atoms rearrange and form **iron oxide** (which we also call rust). But when it happens suddenly with intense heat, it's spectacular — you get bright sparks and lots of energy released as **heat** and **light**.

Think of it like Lego bricks. The metal atoms are one colour of brick, and oxygen atoms are another colour. When they connect, they snap together to build something completely new — that's the metal oxide.

Why Do Metals Burn Differently?

Not all metals burn the same way. **Magnesium** is one of the most dramatic. When it burns, it creates the brightest white light you can imagine — so bright it can hurt your eyes. **Sodium** burns with a yellow-orange flame, while **potassium** burns with a lilac colour. Each metal produces its own unique metal oxide and shows different coloured flames.

Some metals burn more easily than others. The ones that really love oxygen — called **reactive metals** — will burn quickly and powerfully. Less reactive metals, like **copper**, only form oxides slowly when heated.

Think of it like different people at a party. Some people (reactive metals) rush onto the dance floor immediately, while others (less reactive metals) take their time before joining in.

What's Actually Happening?

During a metal burning in oxygen, atoms are rearranging at an incredibly tiny level. The metal atoms and oxygen atoms break apart and reconnect in a new pattern. This rearrangement releases huge amounts of energy — that's why you see heat and light.

The **chemical equation** for burning magnesium looks like this: **$2Mg + O_2 \rightarrow 2MgO$**. This shows that magnesium atoms join with oxygen molecules to create magnesium oxide. The arrow means the reaction transforms one thing into another.

This process happens so fast and releases so much energy that it keeps itself going — that's why the flame continues burning until either the metal or the oxygen runs out.