Exothermic and Endothermic Reactions Explained

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

What Are Exothermic and Endothermic Reactions?

Every time a **chemical reaction** happens, energy moves around. Some reactions release energy (usually as heat), while others absorb energy. Scientists have special names for these two types: **exothermic** and **endothermic** reactions.

The difference between them comes down to energy. In an **exothermic reaction**, energy is **released** into the surroundings. In an **endothermic reaction**, energy is **absorbed** from the surroundings. This energy usually appears as heat, but it can also be light, sound, or electricity.

Exothermic Reactions: Heat Released

Exothermic means 'heat out'. These reactions release energy, making things hotter. When you burn wood in a fire, that's an exothermic reaction. The wood combines with oxygen in the air, and this releases lots of heat and light.

Other everyday examples include: striking a match, burning petrol in a car engine, explosions, cooking food, and even your body breaking down food for energy. All of these release heat into the world around them.

Think of it like a battery getting smaller. When a battery powers a torch, it's releasing stored energy. Exothermic reactions work the same way—they're releasing energy that was trapped in the chemicals.

Endothermic Reactions: Heat Absorbed

Endothermic means 'heat in'. These reactions take in energy from their surroundings, making things colder. When you use an ice pack on a sports injury, it gets cold because it contains chemicals undergoing an endothermic reaction.

Other examples include: melting ice, evaporating water, photosynthesis in plants, and instant cold packs used in first aid. These reactions all need energy to happen, so they pull heat from the surroundings instead of giving it out.

Think of it like charging a battery. When you plug a battery in to charge, it absorbs electrical energy. Endothermic reactions work the same way—they're absorbing energy from their surroundings.

How Can You Tell the Difference?

The easiest way to spot the difference is to feel the temperature. Exothermic reactions make things warmer; endothermic reactions make things cooler. In a science experiment, you can measure the temperature change before and after the reaction happens.

Understanding exothermic and endothermic reactions helps scientists design better fuels, medicines, and cooling systems. It's one of the fundamental ideas in **chemistry** that explains how energy moves through our world.

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