

# CHEMICALS: THE MISUNDERSTOOD HEROES OF MODERN LIFE

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In today's world, chemicals often find themselves cast in a villainous light. From health warnings to environmental alarms, they're seen as villains, their reputation tarnished. But while some chemicals do pose risks, it's time to rethink the narrative. Many of the substances we fear are actually essential to the progress and functioning of modern society. Chemicals are in everything we rely on—our food, clothes, energy, mobile phones, medicines, and more. They fuel our food security, power our homes, protect our nations, enable communication, and save lives. Far from being the enemy, chemicals are the unsung heroes of our daily lives.



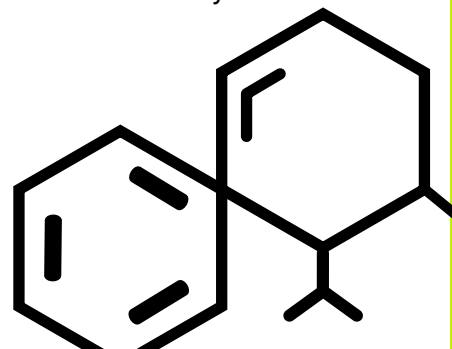
## Foundation of Modern Society

In today's world, "chemicals" often carry a negative connotation. The word conjures images of pollution, harmful pesticides, or synthetic ingredients in everyday products. It's no wonder many consumers actively seek "chemical-free" options, believing them to be safer, healthier, or more natural. But this widespread aversion to chemicals is rooted in misunderstanding.

The reality is far more nuanced: chemicals are not only unavoidable—they are essential to life as we know it - life itself is chemistry. Everything in the universe, from the air we breathe to the water we drink, is made of chemicals. Our bodies rely on countless chemical reactions to function, from metabolising food to carrying oxygen in our blood.

However, in recent years many every-day products have received a bad press owing to their "chemical content" - but all the ingredients used in everything we use in modern society, whether natural or man-made, are chemicals.

In fact, nature is the biggest producer of chemicals, and one of the most successful producers of natural poisons. Some of the deadliest substances on Earth are entirely natural, like botulinum toxin or ricin. On the other hand, synthetic chemicals, such as vaccines or certified biodegradable plastics, have transformed health and sustainability.



## The Cost of Bad Science

"Free-from" has become an overused, and in many cases poorly used slogan, often plastered on food labels and consumer products – free from fat, parabens, synthetic ingredients, or even the vaguely ominous "chemicals." While these statements cater to growing health and environmental concerns, they also reflect and perpetuate a troubling trend: the rise of bad science and media misrepresentation.

The rise of "free-from" claims is often bolstered by poorly conducted or misinterpreted scientific studies. Incomplete or agenda-driven research, cherry-picked data, and unsubstantiated conclusions find fertile ground in a media environment eager for provocative content.

These narratives often oversimplify or exaggerate the dangers of specific chemicals or ingredients. Headlines like "The Hidden Dangers in Your Makeup Bag" or "The toxins secretly hiding in your kitchen cupboard" may drive clicks, but they rarely reflect the scientific consensus. Such stories create a skewed perception of risk, conflating correlation with causation and ignoring the nuance of dosage, context, and regulation.

For instance, parabens, commonly vilified in cosmetics, have been deemed safe by regulatory bodies when used within guidelines. Yet, media-driven hysteria has led to widespread avoidance of these effective preservatives, sometimes replaced by less-tested alternatives that could pose greater risks.

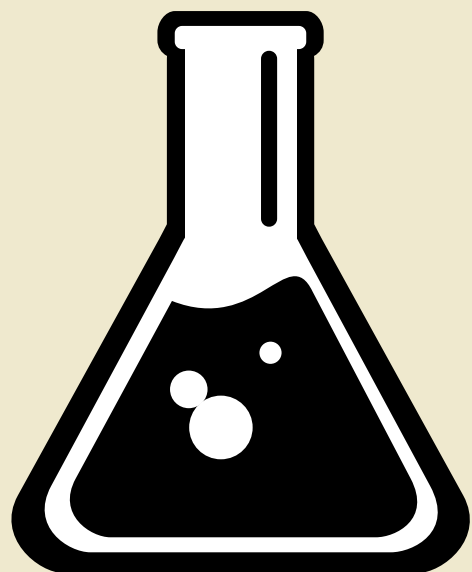
As an outcome, consumers increasingly associate "free-from" labels with health, safety, and environmental benefits, even when scientific evidence does not fully support these perceptions. And when it comes to labelling a product as 'free from chemicals', it is simply just not possible.

## A Million-Pound Bounty

The need for chemicals is so scientifically proven, that 15 years ago, the Royal Society of Chemistry (RSC) announced a £1 million bounty to the first person who can crack the impossible: create a product that the RSC considers to be 100% chemical-free.

The challenge was set in response to research by the UK's cosmetic and toiletries industry that revealed 52% of women and 37% of men actively seek out chemical-free products, demonstrating the deep-seated public confusion about the role and application of chemicals in daily life.

The RSC made the announcement at a media event entitled "The Facts About Chemicals", which explored the popular perception of chemicals as something harmful to be avoided, a view shared by 84% of consumers who feel at some level concerned about the health impact of the chemicals in their everyday products.





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## Cleaning up the Past, Greening up the Future

For too long, chemistry has been saddled with bad press—villainised as the source of pollution or harmful products. But here's the truth: chemistry is neutral. It's how we choose to use it that matters. Instead of fearing it, we need to celebrate and harness its power to build a better world.

Of course, a balanced approach is needed, and some chemicals can cause harm, when not sufficiently regulated. The shift from "forever chemicals" to "green chemicals" represents a critical evolution in how we approach chemical usage and its impact on the environment and human health.

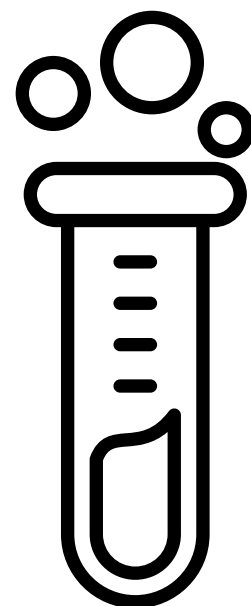
Forever chemicals, such as PFAS (per- and polyfluoroalkyl substances), have earned their ominous nickname due to their persistence in the environment and the human body. These chemicals do not break down naturally, accumulating over time and posing long-term health risks, including cancer, liver damage, and hormone disruption. They are a stark reminder of how the chemicals we use can linger far beyond their intended purpose, creating lasting environmental and health problems.

In contrast, green chemistry offers a more sustainable future. Green chemistry emphasises the design and use of chemicals that are non-toxic, biodegradable, and have minimal environmental impact. The goal is to create safer alternatives to harmful substances like PFAS, focusing on reducing waste, energy consumption, and harmful by products throughout the lifecycle of chemical products.

This transition is critical for the future of both our health and our planet. While forever chemicals are a lingering legacy of past industrial practices, green chemicals are the solution we need to ensure a healthier and more sustainable world moving forward.

By rethinking chemical design from the ground up, we can reduce reliance on harmful substances and create products that benefit both people and the environment, without the lasting consequences that forever chemicals have imposed.

What's needed is a Balanced Approach to Safety. It's not chemicals themselves that are inherently harmful—it's the context of their use. Regulatory bodies like the FDA and EPA ensure that chemicals in food, cosmetics, and other products are safe when used as intended, and will be key to unlocking the green chemicals revolution.



## Chemistry Needs a Comeback

Unfortunately, the negative perception of chemicals has real consequences. Fewer students are pursuing chemistry, university departments are closing, and public trust in science is eroding. If we don't change the narrative, we risk losing the next generation of innovators.

The closure of several UK university chemistry departments is a growing concern that poses significant risks to society, innovation, and the future of scientific discovery. As institutions face financial pressures and shifting priorities, chemistry departments are increasingly on the chopping block. This trend is deeply worrying—not just for academics but for everyone who benefits from the essential contributions of this critical field. The closure of chemistry departments is not just a loss for academia—it's a loss for society. Without it, we risk undermining our ability to build a better future.

Chemistry requires significantly overdue comeback, as it plays a fundamental role in addressing many of the critical challenges facing humanity today. From combating climate change to improving human health and advancing technology, chemistry is at the core of finding sustainable solutions.

## From Zero to Hero

Chemistry just isn't seen as sexy and has a bit of an image problem. For many, it conjures up images of dull textbooks, complex equations, or ominous warnings about "chemical" ingredients. But what if we could change all that? What if we could make chemistry exciting, inspiring, and yes - sexy?

Chemistry is the ultimate Creator. Without chemistry, there'd be no smartphones, sustainable packaging solutions, or the life-saving mRNA vaccines that changed the course of the Covid pandemic. Chemistry doesn't just explain the world; it creates it.

## From Fearing to Favouring

Rather than fearing chemicals, we need to embrace a more informed perspective. Companies and regulators can improve trust by communicating openly about the safety and necessity of chemicals. Moving away from misleading "chemical-free" claims and focusing on sustainability and responsible use can shift the conversation.

By understanding the science, embracing transparency, and rejecting fear-based narratives, we can appreciate the indispensable role of chemicals in sustaining life and driving progress. Instead of demonising them, let's celebrate the remarkable ways chemistry enhances our world.

As we look to the future, it's clear that a sustainable world isn't possible without the transformative power of chemistry. Recognising chemicals as allies—not adversaries—in the fight against climate change is crucial. They are the invisible threads holding together the fabric of a greener, more sustainable planet.

Chemistry is the science of possibilities, creativity, and transformation. By changing how we talk about and celebrate it, we can spark a renewed love for this essential discipline—and inspire the innovators who will shape our world.

**So, let's start the movement: Chemistry is cool. Chemistry is creative. Chemistry is sexy. Let's bring it back!**

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