

Scientists Detect Unusual Airborne Toxin in the US for the First Time

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STORY AT-A-GLANCE

- › Scientists detected airborne medium-chain chlorinated paraffins (MCCPs) in rural Oklahoma for the first time, showing these toxic chemicals are not limited to industrial zones
- › MCCPs are chemically similar to PFAS “forever chemicals,” building up in your fat, disrupting hormones, and increasing the risk of chronic illness
- › Levels of MCCPs in the air peaked during hot daylight hours, revealing that daily temperature swings directly control how much you breathe in
- › The study linked local farmland and biosolid fertilizer use to high MCCP levels, raising concerns about conventional produce and outdoor exposure near agricultural areas
- › Even small lifestyle changes – like switching to organic food, avoiding PVC products, using an indoor air purifier, and improving mitochondrial health – help your body reduce and resist toxic buildup

You're surrounded by chemicals you've never heard of – and some of the most harmful ones are completely invisible. Medium-chain chlorinated paraffins, or MCCPs, are one of them. These compounds are used in industrial products like lubricants, sealants, and flame retardants, but they don't stay put. They escape into the environment and hang in the air, where you inhale them without even realizing it.

What makes MCCPs especially concerning is how long they last. They resist breakdown, accumulate in your fat tissues, and interfere with systems that regulate hormones, metabolism, and brain health. Despite their widespread use, they've remained largely overlooked in public health conversations and unregulated by federal authorities.

Now, research has revealed that MCCPs are not only persistent but also mobile. They don't just sit in products or soil – they move with the weather, rise with the heat, and follow air currents across rural and urban areas alike. If you're breathing, you're likely exposed. That's why this matters. To protect your health and lower your risk, you need to know where these toxins come from, how they behave in the environment, and what to do to limit your exposure.

Scientists Track Dangerous Airborne Chemicals for the First Time

A study published in ACS Environmental AU used cutting-edge technology to monitor MCCPs as they floated through the air over farmland in Oklahoma.¹ These chemicals are used in industrial products like lubricants and plasticizers, but they don't stay in one place. Unlike older testing methods that took weeks or months to collect data, this tool allowed researchers to track MCCPs minute by minute, revealing how they rise, fall, and shift depending on the time of day.

- **Researchers found MCCPs in the air almost every day, at levels as high as polluted cities** – The study ran for about a month and found MCCPs nearly every day, even in a rural area far from big factories. On average, levels hit 3,100 picograms per cubic meter, similar to what's been found in major cities in China. That means even places that seem "clean" carry dangerous chemicals in the air without anyone realizing it.
- **Air levels rose with daytime heat and dropped off again overnight** – These chemicals became more airborne as temperatures rose during the day and settled back into the ground or dust when it cooled at night. So, if you're outdoors in the

middle of the day – working, exercising, or even just walking – your exposure is likely much higher than at night.

- **The most common MCCPs were lighter-weight types more likely to turn into gas –** The six main forms scientists found all had 14 or 15 carbon atoms and six or seven chlorine atoms. These versions are more likely to evaporate into the air, which means they're the ones you're most likely to breathe in. Knowing which versions are most common helps health experts focus on which ones pose the biggest risk.
- **Nearby sources like farming and waste sites likely fed the pollution –** MCCP levels went up on hot days with winds from the southwest, suggesting they were coming from local sources, including [sludge-treated farm fields](#), [wastewater](#), or industrial runoff. When the wind changed or temperatures dropped, the levels fell, pointing to short-range movement rather than distant pollution blowing in.

MCCPs are chemically similar to PFAS, also known as "forever chemicals," which build up in your body over time and resist breakdown. In fact, their similarity led Oklahoma lawmakers to ban biosolid fertilizer statewide.

Heat Drives How Much MCCP You Breathe in Each Day

The study showed a direct link between temperature and MCCP levels. As the air got hotter, the chemicals quickly evaporated off surfaces like soil and dust. This happened in as little as five minutes, meaning you could suddenly be exposed just by being outside on a hot afternoon.

- **Pollution peaked midday and dropped fast in the evening –** MCCP levels spiked in the late morning and fell again by sunset. This pattern wasn't caused by slow-moving weather or breakdown of the chemical – it was driven by heat. So, even spending one hour outside during that peak time raises how much of the toxin gets into your lungs and bloodstream.

- **Lighter MCCPs evaporated and disappeared faster than heavier ones** – Shorter-chain versions of the chemical rose faster during the day and dropped quicker at night. But the heavier forms hung around in soil and dust longer. That means you breathe in the lighter ones more easily, but the heavier ones may stick to your clothes, enter your home, and get into your food over time.
- **Not all MCCPs react to heat in the same way** – Some forms jumped sharply when temperatures rose while others barely moved. That difference matters, because it shows some forms are more likely to become airborne while others stay in the environment longer.
- **Heavier forms stay longer in soil and dust, which raises different risks** – The chemicals with more carbon and chlorine atoms don't float into the air as easily, but they also don't go away quickly. These build up in places like your carpets, furniture, or garden soil, creating long-term risks, especially for children and pets who come into contact with surfaces more often.
- **MCCPs shift between air and surfaces all day long** – These chemicals don't just rise and fall once – they constantly move back and forth based on heat, humidity, and air particles. You could be exposed during your lunch break outside and not again that night, even if you're in the same spot. That makes it hard to track exposure and even harder to regulate these chemicals without monitoring them constantly.

Sunlight and Air Pollution Turn MCCPs Into New, More Toxic Forms

The study also picked up MCCPs that had reacted with oxygen in the air, forming new versions called "oxidized MCCPs." These changes likely happened because of sunlight, ozone, or other molecules floating in the atmosphere. Some of these byproducts are called hydroperoxides, which are known to damage cells once they get inside your body.

- **Other MCCPs bonded with nitrogen, hinting at even more complex risks –** Scientists also detected MCCPs with nitrogen in their structure. These probably formed by reacting with nitrogen-based pollution, like car exhaust or **fertilizer runoff**. The health effects of these altered forms aren't well studied, but their presence means MCCPs don't stay the same after release – they change, and those changes could make them more reactive or dangerous.
- **These altered forms followed the same daily cycle as the originals –** Like regular MCCPs, the altered ones spiked during hot daylight hours and dropped off at night. So, whatever your exposure is during the day, you're not just inhaling the original chemicals – you're also breathing in the altered versions created by sunlight and air pollution.

How to Lower Your Exposure to Airborne MCCPs and Protect Your Health

If you haven't heard of MCCPs before now, you're not alone. These chemicals don't show up on ingredient labels, but they're likely in your environment, especially if you live near agriculture, oil drilling, or industrial zones. Once they're in the air, they're hard to avoid completely. But you do have control over how much of them gets into your body and how well your body handles the exposure.

Your best protection starts with understanding where MCCPs come from and how to block the main ways they enter your system – mostly through your lungs, skin, and food. If you're already dealing with hormone issues, chronic fatigue, or inflammatory conditions, lowering your chemical burden is even more important. Here's how to help reduce your exposure and protect your health:

1. **Avoid biosolid-contaminated food and soil –** MCCPs are chemically similar to PFAS, or "**forever chemicals**," which build up in your body and resist breakdown. They're commonly used in PVC plastics, flame retardants, and metalworking fluids

– and often wind up in wastewater. That wastewater gets turned into biosolid fertilizer and sprayed on conventional farms.

Once in the soil, MCCPs rise into the air during hot weather or end up in your food. Choosing certified organic produce helps you avoid this exposure, since organic standards ban biosolids. If you garden, live near fields, or buy from local markets, ask how the soil was treated and try to stay upwind of sprayed areas during the day, when airborne levels spike.

- 2. Run a high-quality indoor air filter that targets gas-phase pollutants** – Most [air purifiers](#) only filter out particles, not gases. But MCCPs enter the air in gas form during the day. You want a system with activated carbon or other gas-phase filtration, especially if your windows are open or you live downwind from farmland or factories.
- 3. Shower immediately after outdoor exposure to reduce skin absorption** – MCCPs are lipophilic, meaning they love fat. That makes your skin, scalp, and oils a prime target. If you're working outside, walking in farmland areas, or commuting during the heat of the day, shower as soon as you get home. Use warm – not hot – water and a natural cleanser. Skip anything with "fragrance," which often contains the same class of [hormone-disrupting chemicals](#).
- 4. Reduce indoor exposure from plastics, furniture, and flame-retardant materials** – MCCPs don't just come from farmland – they're also in household items like vinyl flooring, cables, older mattresses, and synthetic upholstery treated with flame retardants.

These materials slowly release MCCPs into indoor air and dust. If you're renovating or replacing furniture, skip items made with PVC and synthetic foam. Choose solid wood, organic cotton, or wool. And vacuum with a HEPA filter weekly to reduce MCCP-laced dust that settles on floors and surfaces.

5. Support your mitochondria to better handle chemical stress – Airborne toxins like MCCPs increase oxidative stress, which puts pressure on your **mitochondria**, the tiny engines inside your cells that produce energy and regulate detoxification. The stronger and more resilient your mitochondria are, the better your body neutralizes and processes these exposures.

You can support mitochondrial health by getting daily **sun exposure** (avoid peak hours between 10 a.m. and 4 p.m. until you've **eliminated vegetable oils** from your diet for at least six months), moving your body regularly, and making sure you're eating enough healthy carbs to fuel energy production.

Every small change adds up. Even if MCCPs are in the air around you, you can take real steps to protect your health, especially if you focus on supporting your body's ability to handle the load and reduce exposure where it counts most.

FAQs About MCCPs

Q: What are MCCPs and why are they dangerous?

A: MCCPs are manmade industrial chemicals used in products like lubricants, plastics, and flame retardants. They're toxic, long-lasting, and build up in your fat tissues over time. Once inside your body, they disrupt hormones, increase inflammation, and interfere with metabolism and brain health.

Q: How do MCCPs get into the air?

A: MCCPs are often found in biosolid fertilizer made from treated sewage. When this fertilizer is spread on farmland, the chemicals rise into the air, especially on hot days. They also escape from products like PVC flooring, treated fabrics, and industrial waste. In rural Oklahoma, scientists found them floating in the air nearly every day during a one-month study.

Q: What makes MCCPs similar to PFAS or "forever chemicals"?

A: Like PFAS, MCCPs resist breaking down in the environment and accumulate in your body. They've been linked to hormone disruption and chronic disease. Their persistence, along with concerns about PFAS, led Oklahoma lawmakers to ban biosolid fertilizer, a decision further supported by the detection of high levels of airborne MCCPs near farm fields, likely originating from these biosolids.

Q: When am I most exposed to MCCPs during the day?

A: Exposure spikes during the late morning and early afternoon, when heat pushes MCCPs from soil and surfaces into the air. They settle again at night as temperatures drop. If you spend time outside in the heat, especially near farmland or factories, you're more likely to breathe them in.

Q: How do I lower my exposure?

A: Eat organic to avoid food grown with sludge, run an air purifier that removes gases, shower after being outdoors, avoid products made with flame retardants and PVC, and support your body's detox systems with sun, movement, and nutrient-rich food. Even small changes help your body handle the toxic load more effectively.

Sources and References

- ¹ [ACS Environmental AU June 5, 2025](#)