

CLIMATE COACH

How plastic hides in supposedly eco-friendly laundry products



Advice by [Michael J. Coren](#)

Climate Advice Columnist

January 9, 2024 at 6:30 a.m. EST

Lisa Ratner, 37, wanted to get rid of the plastic in her life. “During covid, I was sitting at home,” she says. “I remember looking at my bathroom and thinking, ‘I’m surrounded by plastic bottles. That’s kind of gross.’”

One by one, she purged bottles of shampoo, soaps and other plastic personal items. When it came time to replace her detergent, a seemingly perfect solution appeared online: laundry sheets.

These thin sheets are the latest iteration of laundry detergent. Like pods, they pack highly concentrated powdered detergent, but they’re even more compact, coming in small, tearable sections. A small cardboard box is priced around \$15 to \$20 for 30 to 60 loads, similar to other forms of detergent, reports Consumer Reports.

Manufacturers are marketing the sheets’ multiple environmental bona fides, including avoiding waste through drips and spills and overdosing, as well as efficient storage and transport with plastic-free packaging.

“They work great,” said Ratner about Earth Breeze detergent sheets, which eliminated the chore of transporting and tossing bulky plastic bottles in her San Francisco apartment. “I introduced it to a lot of my friends.”

She didn’t know one of the top ingredients in the sheets is polyvinyl alcohol, a plastic known as PVA or PVOH. “My assumption was dehydrated soap,” she says, “and I didn’t look much further than that.”

That’s understandable. The ingredient list of virtually every brand of laundry sheets on the market includes PVA, and manufacturers are in no rush to spell it out for you. A couple even market their product as “plastic free,” despite containing the oil-derived plastic.

Scientists, as well as regulatory agencies such as the Environmental Protection Agency, have long considered PVA, which dissolves in water and biodegrades under the right conditions, as safe for humans and the environment.

Most studies, however, have been conducted in labs. Now a small but growing number of scientists are questioning how PVA behaves in the real world. Several peer-reviewed studies have detected PVA in drinking water and human breast milk, and one estimated most of the petrochemical, rather than breaking down in municipal waste-treatment plants, may be flowing into the environment.

But no national testing program tracks the fate of tons of PVA flowing down the drain from cleaning products each year. That's left customers like Ratner in the dark, amid a flurry of contradictory, and sometimes misleading claims.

The rise of the sheet

Every day, millions of households use PVA to get their laundry and dishes clean, says the American Cleaning Institute, a trade association for the cleaning product industry. Manufacturers, which began using PVA in “pods” around 2010, more recently started experimenting with sheets amid growing interest in new packaging for detergents.

Following an army of small firms selling laundry sheets online, industry heavyweights such as Unilever took them mainstream last year. The consumer-product giant says its laundry sheets product “punches above its weight when it comes to sustainability” thanks to its plastic-free packing and ultra-concentrated ingredients that are “in effect, a sheet of solid detergent.” Unilever didn't immediately respond to a request for comment.

Another major brand, Tru Earth, has claimed its “eco-strips” laundry sheets are a “plastic-free laundry detergent,” despite listing PVA as an ingredient. As recently as Friday, when The Washington Post contacted the company to request comment about the claim, the top of its homepage described its sheets as “plastic-free detergent.” By Monday, the language was no longer there. The company did not respond to the Post's requests as of publication time.

Brian Sansoni, a spokesman for the American Cleaning Institute, said the grade of PVOH films used in laundry are environmentally safe because they are highly water-soluble and biodegradable in wastewater. “Therefore,” said Sansoni in an email, “water-soluble detergent PVOH film is not plastic and in wastewater it becomes indistinguishable from other soluble materials.”

But polyvinyl alcohol is still a plastic, said Joe Zagorski, a toxicologist for the Center of Research on Ingredient Safety at Michigan State University, even if it is capable of breaking down in the environment.

“You're using a different kind of plastic material,” says Zagorski, “but it is still ultimately plastic.”

What is PVA and is it safe?

Polyvinyl alcohol has been around for decades. Properly formulated, the plastic can dissolve as easily as sugar or salt in water, before disappearing down the drain. PVA's main selling point, especially in laundry sheets, is its ability to then biodegrade.

Based on decades of lab studies, PVA has been deemed reasonably safe by the EPA. The Food and Drug Administration has also deemed the material "safe to consume in normal quantities," so it even appears in pill capsules and protein powders. It's been a mainstay on the EPA's Safer Choice and Safer Chemical Ingredient list for years.

Unlike most plastics, which persist in the environment, PVA can be broken down by microbes into its molecular components, ultimately leaving mostly water and carbon dioxide. In a review of the scientific literature, Zagorski found no negative environmental impacts as tests showed the material can break down "completely" in carefully designed water-treatment facilities that use the correct microbes to digest the plastic.

But PVA is still a conventional plastic. While manufacturers can make PVA derived from plant sources such as corn or sugar cane, the vast majority of the 37 million pounds of polyvinyl alcohol produced each year globally comes from fossil fuels, specifically ethylene gas, a major product of the U.S. oil fracking industry.

And the lab is not the real world. Conditions for PVA biodegradation aren't always present in municipal waste-treatment plants. A peer-reviewed study, funded by BlueLand, a company that sells a plastic-free laundry detergent tablet, modeled how PVA would behave under actual conditions at wastewater treatment and disposal facilities. That research, conducted by Charles Rolsky, executive director and senior research scientist at the Shaw Institute in Maine, and Varun Kelkar, an environmental engineer, suggested nearly 80 percent of the PVA in the wastewater stream, equivalent to 8,000 tons of plastic annually, or 800 million bottles, may not biodegrade.

Rolsky says we still lack real-world monitoring and testing of how PVA is entering the environment. "We've basically said: Do the research in a real-world scenario to show that it completely breaks down in the right amount of time," said Rolsky. "But until that happens we still don't know how it behaves as a pollutant."

Rethinking PVA

Based on the study it funded, BlueLand filed a petition with the EPA in 2022 asking the agency to remove PVA from its list of preferred safer chemicals. The company, which was founded on the principle of eliminating single-use plastic, originally considered using PVA to deliver its soaps and detergents. But as it began researching the material, said Sarah Paiji Yoo, co-founder and chief executive, the firm realized the compound might prove similar to what it was trying to replace.

"We make the argument if [lab conditions] are not the conditions that actually exist in a wastewater treatment facility or in the natural environment," said Yoo, "it's misleading to call it biodegradable."

But the EPA denied the petition last April, arguing “insufficient” evidence of risk, and the American Cleaning Institute characterized the petition as a “misinformation campaign.”

So far, few scientists have changed their stance on PVA. Zagorski, at Michigan State University, says the findings raise provocative questions, but there’s not enough evidence to be alarmed. “PVA has been used for decades” without conclusive evidence of health or environmental harms, said the toxicologist. “If there were profound issues with it, I would wager we would have detected it. With the evidence currently available, I don’t really have concerns.”

But, he added, we don’t have data to accurately say how much PVA is breaking down in the real world. For that, we need to test for the plastic’s presence in wastewater facilities and nearby waterways. At the moment, no such monitoring exists. “Ultimately,” he said, “this needs to be shown with empirical evidence.”

Should you ditch the sheets?

If you want to purge plastic from your life, the PVA pods and sheets aren’t for you. Almost any PVA bought in stores will be a synthetic polymer derived from petrochemicals — just one that dissolves and, theoretically, biodegrades after draining out of your washing machine.

If your primary aim is to cut back on plastic bottles, sheets remain a viable alternative. For Ratner, a user-experience researcher at a transportation firm, that’s enough to keep laundry sheets in her apartment — for now. Biodegradable plastic, she muses, may be better than pollution generated by moving massive amounts of liquid detergents in big plastic bottles.

But she now has a third option, a modern update on a product that’s been around for more than a century: laundry powder. The first commercial formulations were released in 1907. Today’s versions, which come in pre-measured compressed pellets, do the job as well as any pod or sheet and are just as convenient.

No plastic necessary.