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The chemistry of beauty products is going green

Chemicals. Possibly harmful ones. But increasingly, personal-care products are being reinvented to be safer and more eco-friendly.

By Marla Cone

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At first, the experimental shampoo looked like a putrid salad dressing. Its oil and its water just couldn't get along. They separated in the bottle and, over time, the shampoo took on an ugly brown hue.

The team at Avalon Organics, based in Petaluma, Calif., was trying to make a line of hair, skin and bath products without toxic chemicals, using ingredients derived from plants, such as lavender and coconut.

"It was a disaster," said Morris Shriftman, the company's vice president at the time. "We thought we had failed."

In any recipe, whether for cake or shower gel, swapping out one ingredient for another can result in a complete flop. But the chemists working for Avalon Organics refused to give up. After years of tweaking recipes, at a cost exceeding \$1 million, the company reinvented more than 150 products and came to lead a growing movement dubbed "consciousness in cosmetics."

Innovations in designing green chemicals are emerging in almost every U.S. industry, from plastics and pesticides to toys and nail polish. Some manufacturers of cosmetics, household cleaners and other consumer products are leading the charge, while others are lagging behind.

For decades, many manufacturers used the most powerful weapons in their chemical arsenals, with scant attention to where they wound up or what they might have been doing to people or the planet.

Now, in a fresh take on the pre-World War II slogan, "Better Living Through Chemistry," small chemical companies and giant corporations, including BASF and Rohm and Haas, are implementing the tenets of green chemistry, creating safer substances that won't seep into our bloodstream, endanger wildlife or pollute resources.

A slow shift



Once viewed as part of a fringe lifestyle — rooted in the hippie movement — natural and nontoxic are going mainstream. Driven by regulations, consumer demand, an eco-friendly business philosophy and fear of future lawsuits, large corporations, retailers and manufacturers are eliminating some chemicals, pulling products off shelves and redesigning others. The names are familiar: Wal-Mart, Walt Disney Co., Ikea, The Home Depot, Gerber and Clorox.

Yale University chemistry professor Paul Anastas, known as the father of green chemistry, said the movement is "not simply choosing the next, less-bad thing off the shelf. It's about designing something that is genuinely good.

"Green chemistry is not a theory," he said. "It's being demonstrated by companies over and over again."

With a little ingenuity, every substance in the world "can be reinvented and made safe," said John Warner, former director of University of Massachusetts' green chemistry doctorate program and now president of a research company creating sustainable chemicals.

But the greening of chemistry is a slow shift, not a revolution. Most chemists lack basic training in understanding environmental hazards and seeking safer solutions, and many businesses resist changing familiar chemicals and manufacturing techniques.

Even companies such as Avalon Organics are learning that manufacturing a shampoo or shower gel without toxic substances isn't easy. Synthetic chemicals called phthalates add fragrance; parabens kill germs, and sulfuric acid and petrochemicals create a thick lather. Such substances have long been considered key ingredients in cosmetics and bath products. But they have been linked with cancer, skewed hormones and other threats to people and the environment.

"We heard from everyone that what we were doing was risky; that it was unnecessary; that all the major cosmetics companies use these chemicals so they couldn't be dangerous," Avalon's Shriftman said. "But we decided to subscribe to the precautionary principle. We wanted to do the right thing. We rebuilt our products from scratch. It took a long time. It took a lot of experimentation. And it took a lot of money."

Chemical contamination starts in the womb. Even before taking a breath, the baby's body contains chemicals passed on by the mother.

Tests of umbilical cords show that a newborn's body contains almost 300 compounds — among them mercury from fish, flame retardants from household dust, pesticides from backyards, hydrocarbons from fossil fuels.

Virtually everything we buy, breathe, drink and eat contains traces of toxic substances. The names are confusing; the list, mind-boggling: Bisphenol A in plastic baby bottles and food cans. Phthalates in vinyl toys. Polybrominated flame retardants in furniture cushions. Formaldehyde in kitchen cabinets. Radon in granite countertops. Lead in lipstick. 1,4-Dioxane in shampoo. Volatile organic compounds in hair spray.

Every day, about a half-dozen chemicals are added to the about 83,000 already in commerce. In the United States alone, about 42 billion pounds of chemicals are produced or imported daily.

Not much data

Many chemicals are probably benign, but basic health and safety data are lacking for about 80 percent. Some, such as chlorine gas, are so highly poisonous that a minuscule amount can kill. Others can raise the risk of cancer and other diseases. Animal tests show that some suppress the immune system, obstruct brain development, deplete testosterone, mutate cells, turn genes on and off, or alter

reproductive organs.

Since the 1960s, when the pesticide DDT nearly wiped out the bald eagle, public policy has dealt with the risks on a chemical-by-chemical basis: Ban a few, restrict others and clean up the mess left behind.

Scientists and regulators continually try to figure out whether various chemicals pose a threat, and to what degree, yet they rarely come up with definitive answers. Even when a proven hazard is banned, it can take decades, perhaps centuries, for it to dissipate. Sometimes, its replacement is just as risky.

In the past few years, a less-is-more approach has become big business for companies going green.

Two of the biggest innovators in household products are Shaklee, which is sold person-to-person, and Method Products, which sells through Target, Costco and other large retailers.

"What is driving this market now is concern over bioaccumulation of chemicals in the body," said Jim Greene, Shaklee's vice president of product development. "The public is now reading labels and they're very concerned about what they're putting not only in the environment, but onto their skin and into their bodies."

But even green chemistry products have shades of brown.

No regulations or industry standards govern use of the words "natural" or "organic" in cleaning products, cosmetics or bath products. Many contain traces of toxic substances.

"We accepted this stuff blindly for so long. Now we're asking questions, seeking information. The awareness that we're living in a chemical environment is finally taking hold," Shriftman said.

The Los Angeles Times is a Tribune Co. newspaper.

This should refer to Doreen's story

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