

Speaking About the Dangers of Chlorine



Stephen Ashkin

Most of us have grown up with the idea that whiter whites (and brighter colors) mean cleaner clothes. We continue to use chlorine products with abandon to whiten and to disinfect. We write on white paper and bathe in and drink chlorinated water. After all, who wants bacteria-infested water? In our society, chlorine is ubiquitous-and so are its side effects. In fact, the long-term residual effects from chlorine are becoming such a health hazard that the American Public Health Association is urging the American paper industry to stop using chlorine. The U.S. Environmental Protection Agency (EPA) has found dioxin (a toxic byproduct of chlorine) to be 300,000 times more potent as a carcinogen than DDT

Healthy & Natural speaks with Stephen Ashkin, director of product development and environmental affairs at Seventh Generation, a manufacturer of green, non-toxic cleaning products. Although he has a degree in chemistry, Ashkin gained most of his practical knowledge and experience through direct contact in the chemical industry. He literally grew up in the laboratory of his parent's cleaning products manufacturing company. Ashkin chaired the American Society for Testing and Materials' task force that wrote the national cleaning standard for commercial and institutional buildings. He has also chaired President Clinton's Green Chemistry Challenge Task Force. Ashkin is

acting advisor for a number of EPA programs including the Indoor Environment Division. He has published numerous articles on environmentally preferable products and is a very popular conference speaker.

Q: Does chlorine occur naturally?

Typically chlorine does not normally occur in the environment except as a yellow gas on rare occasions. It's a manufactured substance produced through an industrial process. An electrical current is passed through salt water producing chlorine and caustic soda.

Q: Is chlorine very toxic?

This is where this topic gets very interesting. Many people argue that chlorine is basically safe-that it breaks down into harmless salt and water. Well, that's true-in a laboratory test tube under very controlled conditions. The real issue is not just how toxic chlorine itself is but how the unintended byproducts of chlorine (organochlorines and dioxins) remain in the environment. They are persistent in the environment; they do not break down readily and therefore bio-accumulate.

Q: Is there a chlorine pollution problem?

One of the largest uses of chlorine is in the paper industry. Chlorine is first used to break down the lignan that holds the wood fibers together. Then chlorine is used to bleach the paper to make it white. The effluent or wastewater containing dioxins and other organochlorines are then dumped into streams and waterways. These ingredients are highly toxic and carcinogenic. Once in the waste stream, they come into contact with other organic materials and surfactants and combine to form a host of extremely toxic organic chemicals.

A chain of events occurs: The water becomes polluted; the fish become contaminated; animals eat the fish and people eat the contaminated animals and fish. This can create a very serious health problem; the dioxins and other toxic chemicals, when consumed, accumulate in the fatty tissues. These contaminants are also hormone disrupters because they mimic estrogen. The EPA has observed and documented hormonal imbalance, suppressed immune systems, reproductive infertility and alterations in fetal development of animals. In viewing the big picture, these factors are perhaps the most

frightening results from the widespread use of chlorine.

Q: How widespread is chlorine contamination?

It is so widespread that it would be difficult to find any human being who does not have detectable levels of dioxin in his/her blood.

While we know that chlorine is a substantial environmental problem caused by the paper industry, household bleach and cleaners containing chlorine also pose a serious health risk. For instance, in 1997, 217,989 calls to the Poison Control Center concerned household cleaners. Of those calls, 54,453 were about chlorine bleach and 7,570 were for chlorine disinfectants. So, that means that 28.4 percent of all calls were related to poisonings by chlorine products. What's even more important, most of those calls were about children under 6 years old.

Q: What can happen if these chemicals get into our bodies?

Our bodies are very good at metabolizing many things. Through special enzymes, our bodies are able to rid themselves of many environmental toxic substances that we come into contact with daily. However, dioxins (and other organochlorine compounds) aren't included. Even if we are exposed to very low levels, dioxins remain in the body and accumulate.

The EPA is now saying that this is soon to become a major health risk problem. The cumulative effects of dioxin in humans have been linked to birth defects, cancer, reproductive disorders and immune system breakdown.

Q: Should chlorine be used in our public water supply?

The alternative question would be, should we drink contaminated water? The answer, of course, would be no. It's very important that our water is sanitized. Years ago, there were very few alternatives. However, today, while chlorine is a very effective (and cheap) sanitizer, many scientists are recognizing some serious side effects from chlorine. Today, our technology is getting to the point where, I hope, we will look into a better means of sanitizing our drinking water. This will not be easy because one of the biggest advantages (and ultimately the biggest disadvantage) of using chlorine is the fact that chlorine doesn't break down. Water can be treated with chlorine at the filtration plant and 10 miles away the chlorine is persistent enough to remain in the water and pipes when it reaches the home. There exist many other ingredients that are good sanitizers, but they break down quickly, and the water would become contaminated by the time it reaches someone's home.

We may have a problem if we need to sanitize via a chemical additive. It becomes a sort of oxymoron: chemicals that are persistent also tend to be toxic. The ultimate solution may be to have home-based water filtration/sanitizing systems. This would eliminate the problem of trying to prevent hundreds of miles of pipes, installed a hundred years ago, from contaminating the water.

Q: Are there safe, effective alternatives to chlorine as a bleaching agent and disinfectant?

Absolutely! Primarily, hydrogen peroxide is available to the paper industry and to the soap industry as a bleaching agent. Another new technology uses ozone. Other non-chlorinated household cleaning products, readily available to the consumer, achieve the same bleaching and disinfecting results as chlorine but are nontoxic.

I don't understand why anyone would want to use chlorine products anyway. Chlorine is a respiratory irritant and when mixed with other common household products, it gives off a toxic gas.

Q: What can we do to make a difference?

We could request and purchase processed chlorine-free paper, not just in writing paper but in paper towels, napkins, tissues, and toilet paper. It's a vote for our environment and our health. It may seem to be a small thing, but collectively it really can make a substantial difference.

We need to realize that the technology in the chemical industry has changed as dramatically as in the computer industry. We no longer need to use harmful substances simply because they worked for our grandparents. The technology in the chemical industry is allowing us to replace many of these toxic

ingredients with others that are not only nontoxic but have renewable resources and many environmental benefits.

It's a major educational process for consumers to understand that they, through their buying choices, can make a difference. Did you know that only about 20 percent of shoppers buy their household products in natural food stores? What that says to me is that while consumers recognize the importance of buying supplements and organic foods, they don't recognize the same environmental and health benefits associated with buying chlorine-free paper and other non-toxic cleaners.

Chlorine Facts

Dioxin, a chemical byproduct of the manufacturing of chlorinebleached paper, is believed to be the single most carcinogenic chemical known to science.

When you open the door of your dishwasher after washing, toxic volatized chlorine from dish detergent and tap water is released into the air.

Thanks to chlorine pollution, Americans ingest a daily amount of dioxin that is already 300 to 600 times greater than the EPA's so-called "safe" dose.

The U.S. Environmental Protection Agency has found dioxin to be 300,000 times more potent as a carcinogen than DDT.

Dioxin has been linked to endometriosis, immune system impairment, diabetes, neurotoxicity, birth defects, decreased fertility, and reproductive dysfunction in both women and men.

Studies show that 40-70 percent of the dioxin in bleached coffee filters can leach into your coffee; dioxin found in paper milk cartons also leaches into the milk you drink.

Cancer-causing chemicals like chlorine found in many household products such as coffee filters, disposable diapers, paper towels, and bathroom tissue are readily absorbed through the skin.