

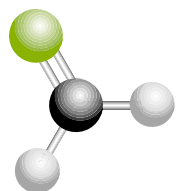
FORMALDEHYDE —

a simple organic chemical made of hydrogen, oxygen and carbon-is a natural part of our world. We make it in our bodies and it occurs naturally in the air that we breathe. Plants and animals also produce formaldehyde. Some vegetables, including Brussels sprouts and cabbage, emit it when they are cooked. Manmade formaldehyde is no different than naturally occurring formaldehyde. It has been commercially manufactured and marketed for more than a century. Formaldehyde is a colorless gas at room temperature and is sold and used as a 36 - 50% solution in water. The solution is known as formalin.

How is formaldehyde used?

When many people think of formaldehyde, the first thing that comes to mind is embalming. Formaldehyde (formalin) has been used as a biological preservative for more than a century. Today, however, such applications account for a very small percentage of formaldehyde use. Formaldehyde made possible the production of the world's first plastic products. It was also used in the polio virus vaccine which eradicated polio in the United States in the mid 20th century.

The chemistry of formaldehyde makes it an extremely versatile ingredient in hundreds of items that improve everyday life. While little or no formaldehyde is present in most final products, the chemical is an essential component in making common consumer items including medicines, vaccines, paper towels, furniture, cabinets, insulation and other building products, photographic film, computers, automobiles, airplanes, bullet-proof vests and windshields, and as an anti-bacterial agent in cosmetics such as mascara.



What is formaldehyde's contribution to the economy?

Production of formaldehyde and formaldehyde-containing goods in the United States accounts for more than 1.2% of Gross Domestic Product (GDP) — or about \$127 billion of a GDP which exceeds \$11 trillion annually. More than 3.6 million workers or 3.3% of total employment in private, non-farm establishments depend on the formaldehyde industry, its downstream fabrication plants, and its network of supplier industries. Consumers would have to spend an additional \$17 billion per year if formaldehyde-based products were replaced by substitute materials.

Is there any environmental impact?

Formaldehyde occurs naturally in the environment. According to the U.S. Environmental Protection Agency (EPA), natural processes in the upper atmosphere may contribute up to 90 percent of the total formaldehyde in the environment. Formaldehyde emissions from human activities make up a relatively small portion of formaldehyde found in the environment.

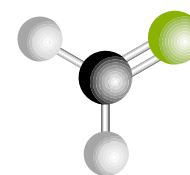
Formaldehyde is a by-product of combustion so cars and trucks emit formaldehyde, as does burning wood. Industrial facilities may also release formaldehyde. Formaldehyde is biodegradable. That means it does not accumulate in the environment. And humans metabolize formaldehyde quickly, so it does not accumulate in the body.

How are people exposed to formaldehyde?

All people are exposed to naturally occurring formaldehyde daily. There are small amounts in many foods such as vegetables and fish, and also in the air. People may come into contact with low levels of formaldehyde from clothes and materials used to build and furnish homes. Some products and materials containing formaldehyde may also emit small amounts of formaldehyde vapor when they are new, but reach naturally occurring background levels as they age.

Is formaldehyde harmful to people?

There is widespread confidence that when formaldehyde is handled and used properly and in accordance with government guidelines, standards and regulations, consumers and workers are protected. A wealth of scientific understanding exists concerning formaldehyde's characteristics and its human health effects. Formaldehyde is a well known sensory irritant to the eyes, nose and throat at elevated levels and is known for its pungent odor. Sensory irritation is temporary and reversible. Governments around the world, academics and industry have conducted and continue to conduct extensive health research on formaldehyde.



Can formaldehyde cause cancer?

The preponderance of information on the health effects of formaldehyde indicates that if protections are in place to prevent sensory irritation then there is negligible risk of cancer. In 2004, the International Agency for Research on Cancer (IARC) - part of the World Health Organization - classified formaldehyde as "carcinogenic to humans." IARC made its decision primarily on what it said was "sufficient evidence that formaldehyde causes nasopharyngeal cancer in humans." This extremely rare form of cancer occurs where the back part of the nose opens into the upper throat.

The principal study upon which the IARC based its decision was conducted by the National Cancer Institute (NCI) and involved workers who were exposed decades ago to formaldehyde levels far higher than in workplaces today. There were over 25,000 workers included in the original NCI cohort and ten workers developed nasopharyngeal cancer. Six of the ten nasopharyngeal cancer cases were concentrated at only one of the 10 plants studied. This plant is often referred to as Plant 1. An independent study of this one plant by researchers at the University of Pittsburgh has revealed that causes other than formaldehyde exposure may account for the nasopharyngeal cancer finding in the NCI study. The NCI has nearly completed its update of this study to make available additional data for a more informed scientific evaluation of this important data set.

