ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

ACROLEIN

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Division of Toxicology and Environmental Medicine ToxFAQs™ **August 2007**

This fact sheet answers the most frequently asked health questions (FAQs) about acrolein. For more information, call the ATSDR Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Exposure to acrolein occurs mostly from breathing it in air. Cigarette smoke and automobile exhaust contain acrolein. Acrolein causes burning of the nose and throat and can damage the lungs. Acrolein has been found in at least 32 of the 1,684 National Priority List sites identified by the Environmental Protection Agency (EPA).

What is acrolein?

Acrolein is a colorless or yellow liquid with a disagreeable odor. It dissolves in water very easily and quickly changes to a vapor when heated. It also burns easily. Small amounts of acrolein can be formed and can enter the air when trees, tobacco, other plants, gasoline, and oil are burned.

Acrolein is used as a pesticide to control algae, weeds, bacteria, and mollusks. It is also used to make other chemicals.

What happens to acrolein when it enters the environment?

- ❏ Acrolein may be found in soil, water, or air.
- ❏ It breaks down fairly rapidly in the air (about half will disappear within 1 day) by reacting with other chemicals and sunlight.
- ❏ Acrolein evaporates rapidly from soil and water.

How might I be exposed to acrolein?

- ❏ Smoking tobacco or breathing air containing tobacco smoke or automobile exhaust.
- ❏ Working in or living near industries where acrolein is manufactured or used to make other chemicals.
- ❏ Inhaling vapors from overheated cooking oil or grease.

How can acrolein affect my health?

There is very little information about how exposure to acrolein affects people's health. The information we have indicates that breathing large amounts damages the lungs and could cause death. Breathing lower amounts may cause eye watering and burning of the nose and throat and a decreased breathing rate; these effects usually disappear after exposure stops.

Animal studies show that breathing acrolein causes irritation to the nasal cavity, lowered breathing rate, and damage to the lining of the lungs.

We do not know if eating food or drinking water containing acrolein affects your health. However, animals that swallowed acrolein had stomach irritation, vomiting, stomach ulcers and bleeding.

How likely is acrolein to cause cancer?

The Department of Health and Human Services (DHHS) has not classified acrolein as to its carcinogenicity. The International Agency for Research on Cancer (IARC) has determined that acrolein is not classifiable as to carcinogenicity in humans. The EPA has stated that the potential carcinogenicity of acrolein cannot be determined based on an inadequate database.

How can acrolein affect children?

In general, children are not likely to be affected by acrolein more than adults. However, children who are sensitive to irritants in the air (such as children with asthma) may be more sensitive to lung irritation from acrolein.

In animal studies, ingestion of very large amounts of acrolein during pregnancy caused reduced birth weights and skeletal deformities in newborns. However, the levels causing these effects were often fatal to the mother.

How can families reduce the risks of exposure to acrolein?

You can reduce your family's exposure to acrolein by reducing their exposure to tobacco smoke, smoke from burning wood products or cooking oils and grease, and exhaust from diesel or gasoline vehicles.

Is there a medical test to determine whether I've been exposed to acrolein?

There are tests to detect acrolein or breakdown products of acrolein in blood or urine; however, these tests are not available in a doctor's office because they require special equipment. These tests also cannot be used to determine if you were exposed to acrolein because acrolein can be produced by the breakdown of other chemicals in the body.

Has the federal government made recommendations to protect human health?

The Food and Drug Administration (FDA) has determined that the amount of acrolein used to prepare modified food starch must not be more than 0.6%.

The Occupational Safety and Health Administration (OSHA) has set a limit of 0.1 parts of acrolein per million parts of workplace air (0.1 ppm) for 8 hour shifts and 40 hour work weeks.

The EPA has restricted the use of all pesticides containing acrolein.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2007. Toxicological Profile for Acrolein (Update). Atlanta, GA: U.S. Department of Public Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology and Environmental Medicine, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-800-232-4636, FAX: 770-488-4178. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html. ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.