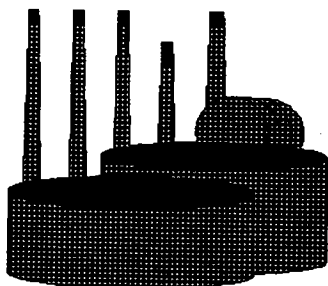




Just the Facts

55-003-1294

Exposure to Chromic Acid Mist (CAM)



- ◆ Army Industrial Hygienists
- ◆ Protection
- ◆ Exposure Hazards

The Occupational Safety and Health Administration (OSHA) has set permissible exposure limits for chromic acid mist (CAM) for personnel in industrial occupations. **The ceiling limit for CAM is 0.1 milligrams per cubic meter (mg/m³)** as stated in Title 29, Code of Federal Regulations, Part 1910.1000, Air Contaminants, Table Z-2. The ceiling is the concentration that shall not be exceeded during any part of the working exposure.

Chromic acid mist (CrH₂O₄) is a medical threat to exposed personnel. Employers must adhere to the ceiling limit placed on CAM to ensure safety from potential over-exposure.

Background

Chromic acid mist and other chromium (VI) compounds can be found in both large and small industrial plants that work with chrome plating, copper stripping, and aluminum anodizing. These chemical materials are also used in photography, for corrosion inhibition, and as catalysts.

The Environmental Protection Agency's Toxic Substances Control Act (TSCA) Inventory lists CAM and water-soluble chromium (VI) compounds. Chromium and its compounds are also on the Community-Right-to-Know List. According to the National Institute for Occupational Safety and Health, an estimated 15,000 industrial workers are potentially exposed to CAM and other chromium (VI) compounds.

Toxicology

The hexavalent form of chromium is a known human carcinogen of the nose, nasal sinuses and lungs. Its irritant properties to the skin and mucous membranes can result in conjunctivitis, dermatitis, lesions of the skin and nasal mucosa, and nasal septum perforation. Long-term or high-dose exposure has been associated with tooth erosion and discoloration, gingivitis, gastric distress, renal and liver dysfunction, and bronchial asthma.

Exposure Limits

According to the Threshold Limit Values and Biological Exposure Indices of the American Conference of Governmental Industrial Hygienists, the time-weighted average for CAM and water-soluble chromium (VI) compounds is 0.05 mg/m³ for an 8-hour workday and a 40-hour workweek. As previously noted, **OSHA has established that occupational exposure to CAM should not exceed 0.1 mg/m³ at any time.** To determine employee exposure, sampling should be conducted during periods of expected maximum airborne concentrations. Samples should be collected in the employee's breathing zone for a minimum of 15 minutes, and at least three measurements should be obtained during one 8-hour work shift.

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Protective Actions to Increase Occupational Safety

Employer Actions—

- ◆ Ensure personnel working with CAM or water-soluble chromium (VI) compounds do not exceed the ceiling limit. If overexposure does occur, respiratory support may be needed.
- ◆ Inform personnel of the hazards of CAM. Advise them of the hazards of exposure, relevant symptoms, and precautions needed to minimize exposure.

Employee Actions—

- ◆ Use protective clothing and equipment when necessary.
- ◆ Wear coveralls or other full-body clothing where there is a potential for exposure to CAM.
- ◆ Protect the head, neck, and face from airborne particles through the use of a respirator with hood and facepiece.
- ◆ Wear gloves, aprons, and footwear that are impermeable to CAM.
- ◆ Use local exhaust ventilation and surface-active agents (i.e., detergents, wetting agents, and emulsifiers) that minimize CAM formation to reduce the threat of exposure during fully enclosed operations.

Nonmedical Hazards Associated with CAM

Chromic acid mist is a powerful oxidizer; it is noncombustible, but will accelerate the burning of combustible materials.

Acknowledgement

We would like to thank the Industrial Hygiene Section at Watervliet Arsenal for their input to this fact sheet.

Glossary of Terms

carcinogen: a substance or agent producing or inciting cancer.

surface-active agent: any compound that reduces surface tension when dissolved in water or water solutions, or which reduces interfacial tension between two liquids, or between a liquid and a solid.

oxidizer: a substance that supports the process of combustion by supplying oxygen to the mixture.

conjunctivitis: inflammation of the conjunctiva, the mucous membrane that lines the inner surface of the eyelids and is continued over the forepart of the eyeball.

dermatitis: inflammation of the skin.