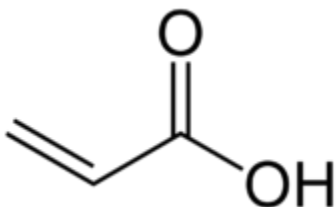


ACRYLIC ACID

Introduction



Acrylic acid (CAS number 79-10-7) is an organic compound with the formula CH₂CHCO₂H. It is the simplest unsaturated carboxylic acid, consisting of a vinyl group connected directly to a carboxylic acid terminus. This colorless liquid has a characteristic acid or tart smell. It is miscible with water, alcohols, ethers, and chloroform. More than one billion kilograms are produced annually. It is polymerized to form [polyacrylic acid](#).

History

Acrylic Acid has been in production for over 30 years. It is also produced naturally by several different types of algae.

Acrylic acid is produced in very large amounts (1.1 billion pounds in 1991) by four companies in the United States. US demand for acrylic acid is increasing at a rate of 4 to 5 percent per year. The largest users of acrylic acid are companies that make acrylic esters and resins, chemicals added to protective surface coatings and adhesives. The fastest growing use of acrylic acid is in the production of superabsorbent [polyacrylic acid](#) polymers. Companies also use acrylic acid to make oil treatment chemicals, detergent intermediates, and water treatment chemicals.

-EPA Chemical Fact Sheet

[2008 List of Acrylic Acid Manufacturers from EPA](#)

In 2008 there were 141 releases of acrylic acid into the atmosphere or environment by manufacturing plants. View [a map of these releases](#) put together by the National Library of Medicine.

Uses

Acrylic acid is found in a variety of household and personal care products:

- ♣ Dental products
- ♣ Floor polish
- ♣ Paint
- ♣ Leather finishings
- ♣ Paper Coatings
- ♣ Plastics
- ♣ Textiles

Toxicity

Human Health Effects

The [International Agency for Research on Cancer](#) states acrylic acid is embryotoxic and teratogenic, having the ability to adversely affect the growth or development of the embryo. However the US [Environmental Protection Agency](#) and other agencies state that no information is available to substantiate these conclusions. Tests done on rats found acrylic acid to be both embryotoxic and teratogenic.

Acrylic acid is not classifiable as a human carcinogen.

Exposure can occur through inhalation, ingestion, and contact to the eyes and skin. Studies show that eye or skin irritation from exposure to acrylic acid can range in intensity from mild to severe. People can be exposed to acrylic acid through direct contact with a product containing it or by inhaling it in air contaminated by a nearby plant manufacturing acrylic acid.

Acrylic acid is listed as a known human respiratory toxicant by the US [Environmental Protection Agency](#).

Test animals who have been subjected to repeated exposures have suffered from lesions in the nose and on the skin, as well as changes in organ and body weight.

Potential Effects of Exposure

- ♣ *MILD TO MODERATE ORAL TOXICITY: Patients with mild ingestions may only develop irritation or grade (superficial hyperemia and edema) burns of the oropharynx, esophagus or stomach; acute or chronic complications are unlikely. Patients with moderate toxicity may*

develop grade II burns (superficial blisters, erosions and ulcerations) are at risk for subsequent stricture formation, particularly gastric outlet and esophageal. Some patients (particularly young children) may develop upper airway edema.

- ♣ *SEVERE ORAL TOXICITY: May develop deep burns and necrosis of the gastrointestinal mucosa. Complications often include perforation (esophageal, gastric, rarely duodenal), fistula formation (tracheoesophageal, aortoesophageal), and gastrointestinal bleeding. Upper airway edema is common and often life threatening. Hypotension, tachycardia, tachypnea and, rarely, fever may develop. Other rare complications include metabolic acidosis, hemolysis, renal failure, disseminated intravascular coagulation, elevated liver enzymes, and cardiovascular collapse. Stricture formation (primarily gastric outlet and esophageal, less often oral) is likely to develop long term. Esophageal carcinoma is another long term complication.*
- ♣ *INHALATION EXPOSURE: Mild exposure may cause dyspnea, pleuritic chest pain, cough and bronchospasm. Severe inhalation may cause upper airway edema and burns, hypoxia, stridor, pneumonitis, tracheobronchitis, and rarely acute lung injury or persistent pulmonary function abnormalities. Pulmonary dysfunction similar to asthma has been reported.*
- ♣ *OCULAR EXPOSURE: Ocular exposure can produce severe conjunctival irritation and chemosis, corneal epithelial defects, limbal ischemia, permanent vision loss and in severe cases perforation.*
- ♣ *DERMAL EXPOSURE: A minor exposure can cause irritation and partial thickness burns. More prolonged or a high concentration exposure can cause full thickness burns. Complications may include cellulitis, sepsis, contractures, osteomyelitis and systemic toxicity.*
- ♣ *CHRONIC EXPOSURE: Animals exposed via chronic inhalation have developed lethargy, weight loss, kidney abnormalities, embryotoxicity, and inflammation to the upper respiratory tract and gastric mucosa.*

-From the National Library of Medicine Hazardous Substances Data Bank

Source : <http://www.toxipedia.org/display/toxipedia/Acrylic+Acid>