

Product Stewardship Summary

Chloroacetic Acid

General Statement

Chloroacetic acid is a chemical used in the production of a variety of important products. It is hazardous by skin absorption, inhalation, and ingestion. Chloroacetic acid exposure requires immediate medical attention to prevent possible irreversible effects.

Chemical Identity

Name: chloroacetic acid (MCA)

Brand Names:

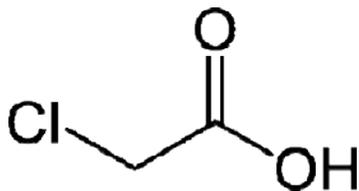
Chemical name (IUPAC): chloroacetic acid

CAS number(s): 79-11-8

ES number: 201-178-4

Molecular formula:

C₂H₃ClO₂ Structure:



Uses and Applications

Ashland uses Chloroacetic acid in the production of various other chemicals, such as modified cellulose. Ashland does not manufacture or sell chloroacetic acid.



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Physical/Chemical Properties

Phys/Chem Safety Assessment

Chloroacetic acid can decompose into hazardous products including carbon oxides and ionic or oxidized chlorine. It is incompatible with strong bases, oxidizing agents, and most common metals.

Property	Value
Form	Crystalline solid
Physical state	Crystalline Solid
Color	Colorless
Odor	Penetrating, similar to vinegar
Density	1.58
Melting / boiling point	62 °C/ 189 °C
Flammability	Not flammable
Explosive properties	Lower explosive limit (dust) 8%
Self-ignition temperature	460 °C
Vapor pressure	0.087 hPa
Mol weight	94.5
Water solubility	Very soluble
Flash point	126 °C
Octanol-water partition coefficient (Log _{k_{ow}})	0.34

Exposure, Hazard and Safety Assessment

The following section describes possible exposures scenarios and hazards associated with chloroacetic acid. The exposure assessment describes both the amount of and the frequency with which a chemical substance reaches a person, a population of people, or the environment. Hazard refers to the inherent properties of a substance that make it capable of causing harm to human health or the environment. The safety assessment reports the possibility of a harmful event arising from exposure to a chemical or physical agent under specific conditions. Just because a substance may possess potentially harmful properties does not mean that it automatically poses a risk. It is not possible to make that determination without understanding the exposure.

Human Health Effects

Human Exposure Assessment

Workers in chemical plants using MCA may be exposed during handling and transport. Dangerous exposures most commonly occur through skin exposure, though inhalation and ingestion exposures are also toxic. Ashland has PPE and training requirements in place to minimize the risk of worker exposure to MCA, as well as procedures to safely respond to MCA exposures.

Human Hazard Assessment

Effect Assessment	Result
Acute Toxicity Oral / inhalation / dermal	H301: Toxic if swallowed
Irritation / corrosion Skin / eye / respiratory test	H310: Fatal in contact with skin H330: Fatal if inhaled
Sensitization	H314: Causes severe skin burns and eye damage
Toxicity after repeated exposure Oral / inhalation / dermal	Not classified
Genotoxicity / Mutagenicity	Not classified
Carcinogenicity	Not classified
Reproductive / Developmental Toxicity	Not classified
Aspiration hazard	Not applicable

Human Health Safety Assessment

Consumer: Consumer contact with concentrated chloroacetic acid is very unlikely.

Worker: Exposure to concentrated chloroacetic acid is extremely hazardous to worker health. Chloroacetic acid absorbs readily through the skin, and can lead to fatalities from single exposures. Symptoms of exposure may be delayed for 1-4 hours. Early symptoms include vomiting, diarrhea, and CNS excitability. These may be followed by CNS depression, coma, and cerebral oedema. Heart and kidney damage are possible in late-stage (within 12 hours) toxicity. Chloroacetic acid toxicity can cause irreversible systemic effects, and immediate medical attention is vital in any significant exposure event.

Environmental Effects

Environmental Exposures

Waste from MCA production and use may lead to aquatic toxicity if discharge concentrations are not properly controlled. Spills of MCA can cause acute ecotoxicity.

Environmental Hazard Assessment:

Chloroacetic acid is very toxic to aquatic life, but is also readily biodegradable. While its effects are severe, contamination of the environment is unlikely to persist.

Effect Assessment	Result
Aquatic toxicity	H400: Very toxic to aquatic life

Fate and behavior	Result
Biodegradation	Readily biodegradable
Bioaccumulation potential	Not bioaccumulative
PBT / vPvB conclusion	Not PBT or vPvB

Environmental Safety Assessment

Acetic acid is not toxic to aquatic life. Acetic acid does not persist in the environment. Further, acetic acid is not expected to accumulate in aquatic species. Overall, acetic acid is not considered to be persistent, bioaccumulative or toxic in the environment.

Risk Management Recommendations

Workers handling MCA must receive training on the hazards of exposure to this substance, including proper intervention methods in case of exposures. Workers must wear MCA-resistant PPE at all times. A 30 °C bath of saturated (7-9%) sodium bicarbonate should be accessible in case of skin exposure. If dermal exposure to an area of 1% body surface area or greater occurs, immediately place individual in the bicarbonate bath for 30 minutes while medical attention is summoned. If no bicarbonate bath is available, individuals should immediately proceed to an emergency shower and wash thoroughly for at least 15 minutes while medical attention is summoned. Physicians treating MCA exposure should refer to IPCS INTOX PIM 352 for treatment guidelines.

Exposure to chloroacetic acid in the workplace is covered by established exposure limits. A partial list of references follows:

- ACGIH TLV: 0.5 ppm (8h TWA)
- EU and member states: <http://osha.europa.eu/en/topics/ds/oel/index.stm/members.stm>
- China: 2 mg/m³ (ceiling limit)

Regulatory Agency Review

Chloroacetic is listed in:

- the list of REACH Registered substances ((EC) 1907/2006)
- the US TSCA inventory
- the Australia Inventory of Chemical Substances
- the Canada Domestic Substances List
- the China Inventory of Existing Chemical Substances
- the Japan Inventory of Existing & New Chemical Substances
- the Korea Existing Chemicals Inventory
- the New Zealand Inventory of Chemicals
- the Philippines Inventory of Chemicals and Chemical Substances

Regulatory Information / Classification and Labeling

Under the Globally Harmonized System for classification and labeling (GHS), substances are classified according to their physical, health, and environmental hazards. The hazards are communicated via specific labels and the (Extended) SDS. GHS attempts to standardize hazard communication so that the intended audience (workers, consumers, transport workers, and emergency responders) can better understand the hazards of the chemicals in use.

GHS Classification:

Acute toxicity (oral): Category 3
Acute toxicity (dermal): Category 3
Acute toxicity (inhalation): Category 3
Skin corrosion/irritation: Category 1B
Aquatic acute toxicity: Category 1

Hazard Statements:

H301: Toxic if swallowed.
H311: Toxic if in contact with skin.
H331: Toxic if inhaled.
H314: Causes severe skin burns and eye damage.
H410: Very toxic to aquatic life with long lasting effects (Includes H400).
H335: May cause respiratory irritation.

Signal Word:

Danger

Precautionary Statements:

P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection. P284: Wear respiratory protection.
P303+P361+P353: IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310: Immediately call a POISON CENTER or doctor/physician.

Hazard Pictograms:



Conclusion

Proper training and safe handling is essential to working with chloroacetic acid. Irreversible effects may occur rapidly if specific countermeasures to exposure are not properly employed. Medical professionals should consult IPCS INTOX PIM 352 for treatment instructions.

Contact Information with Company

Ashland LLC
5200 Blazer Parkway
Dublin, Ohio 43017
<http://www.ashland.com/contact>

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Additional Information

For more information on GHS, visit <http://www.osha.gov/dsg/hazcom/ghsguideoct05.pdf> or http://live.unece.org/trans/danger/publi/ghs/ghs_welcome_e.html.
Ashland product stewardship summaries are located at <http://www.ashland.com/sustainability/product/product-stewardship>

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REACH registration is specific to Importers/Manufacturers that place the chemical on the EU market, and is specific to registered uses. Inclusion on the list of REACH Registered Substances does not automatically imply registration by Ashland.

Inclusion on the New Zealand Inventory of Chemicals applies only to the pure substance listed. The importer of record must determine whether or not their substances are in compliance.