

SAFETY DATA SHEET



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ACETIC ANHYDRIDE

SDS No. M0002

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Acetic Anhydride

Synonyms: Acetic acid, anhydride

Recommended Use: This product is recommended for laboratory and manufacturing use only. It is not recommended for drug, food or household use.

2. HAZARDS IDENTIFICATION



Classification:

Flammable Liquids: GHS Category 3

Acute Toxicity, Inhalation: GHS Category 3

Acute Toxicity, Dermal: GHS Category 5

Acute Toxicity, Oral: GHS Category 4

Skin Corrosion: GHS Category 1B

Eye Damage: GHS Category 1

Label Elements

Signal Word: DANGER!

Hazard Statements:

H226 – Flammable liquid and vapor.

H302 – Harmful if swallowed.

H313 – May be harmful in contact with skin.

H314 – Causes severe skin burns and eye damage.

H331 – Toxic if inhaled.

Precautionary Statements:

P210 – Keep away from heat/sparks/open flames/hot surfaces. – No smoking.

P280 – Wear protective gloves/protective clothing/eye protection/face protection.

P284 – Wear respiratory protection.

P301+P310 – If SWALLOWED: Immediately call or POISON CENTER or a doctor/physician.

P303+P361+P353 – If on skin or hair: Remove/take off immediately all contaminated clothing. Rinse skin with water/shower.

Clear focus. Consistent results. Complete confidence.

P304+P341 – If inhaled: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing.

Emergency Overview

Causes burns by all exposure routes. Harmful; if inhaled or swallowed. Flammable liquid and vapor. Lachrymator. Moisture sensitive. Target Organs: Eyes, skin, and mucous membranes.

HMIS Rating:

Health – 2* Flammability – 2 Physical Hazard – 1 PPE – User supplied

NOTE: HMIS ratings use a numbering scale that ranges from 0 - 4 to indicate the degree of hazard. A value of zero means the chemical presents no hazard while a value of four indicates a high hazard. These ratings are based on the inherent properties of this chemical under expected conditions of normal use and are not intended to be used in emergency situations. PPE is determined by the user based on their needs and conditions.

3. COMPOSITION AND INFORMATION ON INGREDIENTS

<u>Ingredient</u>	<u>CAS No</u>	<u>Percent</u>	<u>Hazardous</u>
Acetic Anhydride	108-24-7	>94%	Yes
Acetic Acid	64-19-7	<6%	Yes

4. FIRST-AID MEASURES

Inhalation: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Ingestion: Get medical help immediately. Do not induce vomiting. If vomiting occurs naturally, have victim lean forward. If victim is conscious and alert, give a cupful of water. Never give anything by mouth to an unconscious person. Get medical help.

Skin Contact: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing. Get medical attention immediately. Wash clothes before reuse.

Eye Contact: Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

Notes to Physician: Treat symptomatically and supportively.

5. FIRE FIGHTING MEASURES

Flammability: Flammable liquid and vapor (GHS Category 3)

Auto-ignition Temperature: 316° C (600° F)

Flash Point: 54° C (129° F)

Flammable Limits: Lower Limit – 2.9 vol %, Upper Limit – 10.3 vol %

Products of Combustion: May decompose into irritating and highly toxic gases under fire conditions (carbon monoxide and carbon dioxide).

Specific Fire Hazards: As in any fire, always wear self-contained breathing apparatus in pressure-demand (MSA/NIOSH approved or equivalent), and full protective gear. Vapors can travel to a source of ignition and flash back. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Water reactive. Material will react with water and may release a flammable and/or toxic gas. Use water spray to keep fire-exposed containers cool. Wear appropriate protective clothing to prevent contact with skin and eyes. May ignite or explode on contact with steam or moist air.

Specific Explosion Hazards: Containers may explode in the heat of a fire. Vapors may form an explosive mixture with air.

Fire Fighting Media: Use dry sand or earth to smother fire. If water is the only media available, use in flooding amounts. DO NOT USE WATER! Do NOT use straight streams of water. Contact professional fire-fighters immediately. Cool containers with flooding quantities of water until well after fire is out.

National Fire Protective Association: Health - 3, Flammability - 2, Reactivity - 1

NOTE: NFPA ratings use a numbering scale that ranges from 0 - 4 to indicate the degree of hazard. A value of zero means the chemical presents no hazard while a value of four indicates a high hazard. They are for use by emergency personnel to address the hazards that

are presented by short term, acute exposure to this product under fire, spill, or similar emergencies. Ratings involve data and interpretations that may vary from company to company.

6. ACCIDENTAL RELEASE MEASURES

Use water spray to reduce vapors. Water spray may reduce vapors but still not prevent ignition in closed spaces. Absorb spilled liquid with sorbent pads, socks, or other inert material such as vermiculite, sand, or earth. Do not use sawdust or any combustible material. Use spark-proof tools. Spill may be carefully neutralized with soda ash (sodium carbonate) or quick lime (calcium oxide). Provide ventilation to the affected area and remove all ignition sources. Approach the spill from upwind and pick up absorbed material and place it in a suitable container. Avoid runoff into storm sewers and ditches which lead to waterways. Always use proper personal protective equipment as described in section 8.

7. HANDLING AND STORAGE

Precautions: Always use proper personal protective equipment as described in section 8. Do not allow water to get into the container because of violent reaction. Wash thoroughly after handling. Ground and bond containers when transferring material. Use spark-proof tools and explosion proof equipment. Avoid contact with eyes, skin, and clothing. Remove and dispose of contaminated clothing and shoes. Empty containers contain product residue (liquid and vapor) and can be dangerous. Keep container tightly closed and away from heat, spark, and flame. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks, or open flames. Use with adequate ventilation. Avoid breathing vapor or mist. Use corrosion-resistant transfer equipment when dispensing.

Storage: Keep away from heat, sparks, flames, and contact with oxidizing materials. Keep in a tightly closed container. Store in a cool, dry, well-ventilated area. Do not store in direct sunlight. Do not allow contact with water.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls: Use explosion-proof ventilation equipment. Facilities storing or using the material should be equipped with eyewash station and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Personal Protection: Wear protective chemical goggles and face shield for eye and face protection. Use butyl rubber gloves and protective clothing to prevent skin exposure. A respiratory protection program that meets OSHA 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever possible. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

Exposure Limits:

ACGIH – 5 ppm TWA;

NIOSH –200 ppm IDLH;

OSHA Final PELs – 5 ppm TWA; 20 mg/m³ TWA

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State and Appearance: Clear, colorless liquid.

Odor: Strong, pungent, acetic odor

Odor Threshold: <1 ppm

Molecular Formula: C₄H₆O₃

Molecular Weight: 102.09

Auto-ignition Temperature: 316° C (600° F)

Flash Point: 54° C (129° F)

Flammable Limits: Lower Limit – 2.9 vol %, Upper Limit – 10.3 vol %

pH: 3 (10g/L aq sol 20°C).

Boiling Point: 140° C @ 760 mm Hg

Freezing/Melting Point: Not available

Decomposition Temperature: -73.1° C

Specific Gravity: 1.082 g/cm³

Vapor Density (Air=1): 3.5

Vapor Pressure: 3.9 mm Hg @ 68° F.

Evaporation Rate (Butyl acetate = 1): 0.46

Viscosity: 1.9 mPa @ 20°C

Solubility: Decomposes

Conductivity (25°C): Conductive; Conductivity = 4.8×10^7 pS/m; Dielectric Constant = NA; Relaxation Time Constant = NA

10. STABILITY AND REACTIVITY

Stability: Stable. However, may decompose if exposed to moist air or water. Substance is readily hydrolyzed. Reacts with water to form corresponding acid.

Conditions to Avoid: Ignition sources, contact with water, excess heat, exposure to moist air or water.

Incompatibility With Various Substances: Metals, strong oxidizing agents, reducing agents, bases, alcohols, amines, ammonia, nitrates, nitric acid, permanganates, phenols, sodium hydroxide, hydrogen peroxide, chromium trioxide, potassium hydroxide, perchloric acid, ethanol.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, irritating and toxic fumes and gases.

Hazardous Polymerization: Has not been reported.

11. TOXICOLOGICAL INFORMATION

Routes of Entry: Inhalation, skin absorption, skin contact

Acute Exposure Hazards:

INHALATION HAZARD: Harmful if inhaled. Causes chemical burns to the respiratory tract. May cause lung damage.

Aspiration may lead to pulmonary edema.

INGESTION HAZARD: Harmful if swallowed. Causes gastrointestinal tract burns. May cause perforation of the digestive tract. Ingestion of large amounts may cause CNS depression.

SKIN CONTACT HAZARD: Causes skin burns.

EYE CONTACT HAZARD: Eye damage may be delayed. Contact with liquid is corrosive to the eyes and causes severe burns. Lachrymator (substance which increases the flow of tears).

Chronic Exposure Hazards: Effects may be delayed. Prolonged skin contact may be painless and cause redness and subsequently a white appearance of the skin accompanied by wrinkling.

Animal Toxicity:

Inhalation, rat: LC50 = 1000 ppm/4H;

Oral, rat: LD50 = 1780 mg/kg;

Skin, rabbit: LD50 = 4 mL/kg;

Carcinogenicity: Not listed as a carcinogen by ACGIH, IARC, NTP, or CA Prop 65

Epidemiology: No information found.

Teratogenicity: No information found.

Reproductive Effects: No information found.

Mutagenicity: No information found.

Neurotoxicity: No information found.

12. ECOLOGICAL INFORMATION

Ecotoxicity: No information available.

Environmental Fate: Terrestrial: Will readily infiltrate downward toward ground water. Aquatic: Will react slowly and become miscible, and will produce an irritating vapor. Mixing takes place and the spill is diluted. In rivers, the principal mixing agent is stream turbulence. Atmospheric: Since acetic anhydride is a relatively non-volatile liquid, direct venting of the vapor to the atmosphere from a hole in a ruptured vessel does not constitute a significant hazard downwind. Only vapor released from a liquid pool spilled on a ground or water surfaces is important. Not expected to bioconcentrate or biodegrade.

13. DISPOSAL CONSIDERATIONS

Material that cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. Processing, use or contamination of this product may change the waste management options. Waste generators must decide if discarded material is a hazardous waste. State and local disposal regulations may differ from federal disposal definitions found in 40 CFR 261.3. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. TRANSPORT INFORMATION

US DOT, IATA, IMO

Proper Shipping Name: Acetic Anhydride
Hazard Class: 8
UN Number: UN1715
Packing Group: II

Canada TDG

Proper Shipping Name: Acetic Anhydride
Hazard Class: 8 (3)
UN Number: UN1715
Packing Group: II

15. REGULATORY INFORMATION

US Federal Regulations:

TSCA: CAS# 108-27-7 is listed on the TSCA Inventory.
Health and Safety Reporting List: CAS# 108-27-7 is not listed.
Chemical Test Rules: CAS# 108-27-7 is not listed.
Section 12b: Not listed.
TSCA Significant New Use Rule: Does not have an SNUR under TSCA.
CERCLA Hazardous Substances: CAS# 108-27-7 – 5000 lb, 2270 kg final RQ
SARA Section 302: Does not have a TPQ
SARA Codes: CAS# 108-27-7 – immediate, delayed, fire, reactive
Section 313: Acetic Anhydride (CAS# 108-27-7) is not subject to SARA Title III Section 313 and 40 CFR 373 reporting requirements.
Clean Air Act CAS# 108-27-7 is not listed as a hazardous air pollutant (HAP). It is not a Class 1 Ozone Depleter. It is not a Class 2 Ozone Depleter.
Clean Water Act: CAS# 108-27-7 is listed as a Hazardous Substance. It is not a Priority Pollutant. It is not a Toxic Pollutant.
OSHA: Not considered highly hazardous by OSHA.

US State Regulations:

CAS# 108-27-7 is found on the following state right-to-know lists: California, New Jersey, Pennsylvania, Minnesota, and Massachusetts
California Prop 65: California No Significant Risk Level: Not listed

Canada:

DSL/NDL: CAS# 108-27-7 is listed on Canada's DSL list.
WHMIS: This product has a WHMIS classification of B3, D1A, D2B, E. This product has been classified in accordance with hazard criteria of the Controlled Products Regulations and this MSDS contains all the information required by those regulations.
Ingredient Disclosure List: CAS# 108-27-7 is listed on Canada's Ingredient Disclosure List.

DSCL (EEC):

Hazard Symbols: C, F
Risk Phrases: R10 – Flammable; R20/22 – Harmful if swallowed or ingested; R34 – Causes burns.

Safety Phrases: S26 - In case of contact with eyes, rinse immediately with plenty of water and seek medical advice;
S6/37/39 - Wear suitable protective clothing, gloves and eye/face protection; S45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
WGK (Water Danger/protection): CAS# 108-27-7: 1

16. OTHER INFORMATION

Originally Prepared: 5/21/2007

Last Revised: 12/1/2015 – Updated information for eye and face protection in Section 8.

The information contained herein is based on current knowledge and experience; no responsibility is accepted that the information is sufficient or correct in all cases. Users should consider these data only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use and disposal of these materials and the safety and health of employees and customers and the protection of the environment.

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