


Number: 022

## Section 1. Product and Company Identification

Product name: Acetic acid
Synonyms: -
Recommended use and Restrictions on use: Pharmaceutical production of the following medicines: acetic anhydride, acetic acid cellulosic ester, the monomer of acetic acid vinyl ester, acetic acid esters, chloroacetic acid, plastic products, medical products, dyestuffs, insecticide, photographic chemicals, etc.; food additive (more or less tart flavor); cream coagulant; oil well acidifies; textile printing.
Manufacturer, Importer, or Supplier: Shiny Chemical Industrial Co., Ltd. Address: No.5, Yeong Gong 1 <sup>st</sup> Rd, Yeong An Dist., Kaohsiung 82841, Taiwan, R.O.C. Telephone: +886-7-8619171 ext. 711~714
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## Section 2. Hazards Identification

Classification: 1. Flammable liquids, Category 3 2. Skin corrosive/irritation, Category 1 3. Serious eye damage/eye irritation, Category 1 4. Corrosive to metals, Category 1 5. Acute toxicity (skin), Category 4 6. Aquatic toxicity (acute), Category 3
Label elements: <div style="text-align: center;">  </div> Hazard pictograms: Flame, Corrosion, Exclamation mark Signal word: Danger Hazard Statements: 1. Flammable liquid and vapour. 2. Causes severe skin burns and eye damage. 3. Causes serious eye damage. 4. May be corrosive to metals. 5. Harmful in contact with skin. 6. Harmful to aquatic life.

Precautionary statements:

1. Do not breathe gas/fumes/vapor/mist.
2. Keep containers in a well-ventilated place.
3. If contacted with eyes, flush with plenty of water before seek for medical attention.
4. Wear eye protect or face protect equipment.

Other Hazards: -

### Section 3. Composition/Information on Ingredients

Pure substance

Chemical Name: Acetic acid

Synonyms: Glacial acetic acid, Ethanoic acid, Ethylic acid, Methanecarboxylic acid

CAS NO. : 64-19-7

Weight: 100%

### Section 4. First Aid Procedures

Description of first aid measures:

• Inhalation:

1. Ensure self-safety based protection procedures before rescue.
2. Remove contamination sources or move victims to fresh air.
3. If breathing stops, have trained personnel administer artificial respiration. Administer cardiopulmonary resuscitation (CPR) immediately if the heart has stopped.
4. Avoid victim's unnecessary movement.
5. Symptoms of lung edema may delay 48 hours.
6. Get medical attention immediately.

• Skin contact:

1. Wear leak-proof gloves if necessary to avoid touching such a chemical material.
2. Wash contaminated sites tenderly with warm water for 20~30 minutes.
3. Flush repeatedly if irritation persists.
4. Remove contaminated clothing, shoes, and leather when washing.
5. Get medical attention immediately.
6. Clean contaminated clothing, shoes, and leather thoroughly before reuse or abandon.

• Eye contact:

1. Wear leak-proof gloves if necessary to avoid touching such a chemical material.
2. Immediately lift eyelids, flushing eyes with plenty of warm water for at least 20 minutes.
3. Immediately lift eyelids, flushing eyes with plenty of water for at least 20 minutes

until removing contaminated materials. 4. Avoid flushing to unaffected eye. 5. Repeat flushing if irritation persists. 6. Get medical attention immediately. • Ingestion: 1. Never give anything by mouth to victims will soon lose consciousness or lose consciousness already or with the convulsion. 2. Have victims gargle thoroughly with clear water. 3. Don't induce vomiting. 4. Have victim drink 240~300 mL of water. 5. If vomiting occurs, lean victim forward to reduce the risk of ingesting vomits, repeating administering water. 6. If breathing stops, have trained personnel administer artificial respiration. Administer cardiopulmonary resuscitation (CPR) immediately if the heart has stopped. 7. Get medical attention immediately.
The most Important Symptoms and Hazardous Effects: 1. Irritation, burning sensation. 2. Inhalation may cause fatal lung edema.
Protection for emergency personnel: Use appropriate personal protective equipment such as class C clothing to take first aid in a safety area.
Notes to Physicians: 1. If inhaled, consider oxygen given. 2. Avoid gastric lavage or induce vomiting.

## Section 5. Firefighting Measures

Suitable extinguishing media: Spray water mist, chemical dry, alcohol foam, and carbon dioxide.
Special hazards during firefighting: 1. Flammable liquids, with air will produce explosive mixtures. 2. Vapors heavier than air will propagate to distant places. It may cause flash back when meeting fire sources. 3. May accumulate in low-lying areas to increase risk of burning and toxicity. 4. Heated containers may break in a fire scene.
Firefighting procedures: 1. Evacuate and extinguish fire from safe distance or protected areas. 2. Place in windward areas to avoid dangerous vapor and poisonous decomposing materials. 3. Stop the leak first before extinguishing fire. Let it burn if leaks cannot be stopped

- and have on harm in surroundings. If extinguishing fire in advance without stopping leaks, vapors with the air will form explosive mixtures and ignite again.
4. Isolate unfired materials and protect personnel.
  5. Move containers away from the fire scene in safe condition.
  6. Cool exposed storage tanks or containers with water mist.
  7. If leaks have not ignited, spray water mist to disperse vapors and protect the personnel stop spill.
  8. It is invalid to extinguish fire with spouts.
  9. Large fire of large-scale area, use auto-operated control shelf of water mist or auto-waved extinguishing water aims.
  10. Evacuate from a fire scene as possible and let the fire burn thoroughly.
  11. Keep away from storage tanks.
  12. When safety valves of storage tanks alarm or change color, evacuate immediately.

Protective equipment for firefighters: Extinguishing staffs should wear coverall-type chemical protective clothing, and respirators (wear flash-resistant aluminum coats if necessary).

## Section 6. Accidental Release Measures

Personal precautions:

1. Restrain personnel close to the spill area before totally cleaning out.
2. Confirm the cleaning work be responsible by trained staffs.
3. Wear appropriate personal protective equipments.

Environmental precautions:

1. Ventilate this area.
2. Remove all sources of ignition.
3. Report to governmental safety and hygiene institutes and related units.

Methods for cleaning up:

1. Do not touch spilled material.
2. Avoid leakages flushing to sewers or confined areas.
3. Try to stop or reduce leaks in safety condition.
4. Use sand, soil, and inert absorbing agents to block leaks.
5. Small spill: Use the material, not react with spill, to absorb. Contaminated absorbing agents have same risk as spill. Place in covered and labeled containers. Spray water on spilled areas. Use plenty of water to dilute small spill.
6. Large spill: Contact fire control, urgent handling units and suppliers to seek aid.

## Section 7. Handling and Storage

### Handling:

1. This material is corrosive and flammable liquid. Engineering control should be applied and make the best use of personal protective equipments when handling. Educate risk of this material and safety training of use.
2. Remove all ignition sources away from heat and incompatible substances.
3. There should be a "No smoking" sign in workspace.
4. If leaks or adverse ventilation occur, report immediately.
5. Check whether containers spill before operating.
6. Use storage containers suggested by the manufacturers.
7. All barrels, containers, and pipelines must set earth and contact with naked metal.
8. Use corrosion-resistant transshipment apparatus to allocate. Connect containers with same electric potential.
9. Empty tanks, containers, and pipelines may have risk residuals. Don't weld, cut, hole or do other heat work before clearing up.
10. Have corrosive solutions add into water while mixing with water, but not add water into corrosive solutions. Slowly add raw material under stir and use cold water to avoid surplus of heat producing.
11. Avoid mist or vapors. Operate in well-ventilated assigned place and adopt the minimum consumption. Separate operation and storage areas.
12. Wear appropriate personal protective equipments to avoid contacting with this chemical or contaminated apparatus if necessary.
13. Don't use with incompatible substances to avoid increasing risk of fire and explosion.
14. Don't pour contaminated liquids back to original storage containers.
15. Containers should be labeled, confined and prevented from damage while not using.

### Storage:

1. Store in shady, cool, dry, and well-ventilated place that sunshine cannot directly illuminate, and keep away from heat, ignition sources, and incompatible substances.
2. Storage apparatus should be constructed with the refractory materials.
3. Storage areas should be labeled clearly with no barriers. Permit assigned or trained personnel to enter.
4. Keep storage areas away from workspace, lifts, building, room exits, and main passages.
5. Have appropriate fire extinguisher and leak cleaning apparatus near storage

- areas.
6. Check containers regularly whether damage or leak.
  7. Check all new containers whether appropriately labeled and no damage.
  8. Limit storage.
  9. The floor should be constructed with the impermeable materials to avoid absorbing from the floor. Store in appropriate and labeled containers. Avoid piling up and damaging containers. Keep airtight.
  10. Containers may have risk residues. Those should be airtight and stored separately.
  11. Store in accordance with the storage temperature suggested by chemical manufacturers or suppliers.
  12. Storage tanks should be surface tanks. Seal whole area on the bottom to avoid seepage surrounded with liquid dikes, which can block the whole capacity.

## Section 8. Exposure controls

### Engineering controls:

1. Use spark-resistant and earth-connection ventilation system separately.
2. Use corrosion-proof ventilation systems separately.
3. Direct outside exhaust vents.
4. Supply adequate fresh air to replenish the exhausted air.

### Control parameters

TWA	STEL	CEILING	BEIs
10 ppm	15 ppm	-	-

### Personal protective equipment:

- Respiratory protection:
  1. < 50 ppm: Stable flow air-feed type respiratory protective equipments, dynamical air purifying type or chemical full-type with organic vapor cartridges respiratory protective equipments, portable full-type or air-feed respiratory protective equipments.
  2. Unknown: Portable positive-pressure type respiratory protective equipments, positive-pressure full and air-feed type respirator.
  3. Escape: Mask with organic vapor cartridges, portable escape-type respiratory protective equipments.
- Hand protection: Leak-proof glove materials of Butyl rubber, Teflon, Viton, Saranex, Responder, 4H, and Tychem10000 are better.
- Eye protection: Chemical safety goggles and masks.
- Skin and physical protection: Coveralls, work boots.

### Hygiene measures:

1. Remove contaminated clothing quickly as possible after work. Clean clothing

- before reuse or abandon. Tell cleaning staffs the harmfulness.
2. Forbid smoking or eating in workplace.
  3. After handling this material, wash hands thoroughly.
  4. Keep workplace clean.

## Section 9. Physical and Chemical Properties

Appearance: Colorless solids lower than 16°C; colorless, deliquescence liquids higher than 16°C	Odor: Strong vinegar smell, shed tears
Odor threshold: 0.037~0.15 ppm (monitor)	Melting point: 16.6°C
pH: 2.4 (1 M/L water)	Boiling point/Boiling range: 117.9°C
Flammability (solid, gas): -	Flash point: 39°C
Decomposition temperature: -	Test method: close cup
Auto-ignition temperature: 516°C	Explosion limits: 4% ~ 19.9% (ice crystal)
Vapor pressure: 15.7 mmHg (25°C)	Vapor density: 2.07 (air=1)
Density: 1.05 (water=1)	Solubility: Soluble in water
Partition coefficient (n-octanol/water, log K <sub>ow</sub> ): -0.17	Volatility rate: 0.97 (N-butyl acetate=1)

## Section 10. Stability and Reactivity

Chemical stability: Stable under ordinary conditions.
Possibility of hazardous reactions: <ol style="list-style-type: none"> <li>1. Strong oxidants (chromic acid, hydrogen peroxide, nitric acid, perchloric acid, potassium permanganate, sodium peroxide) - Intense reaction increases fire and explosion risk.</li> <li>2. Strong alkaline or caustic alkaline (such as sodium peroxide and oxidizing sodium or hydrogen) or alkaline - May cause intense reaction.</li> <li>3. Most metals (except for aluminum) - May release flammable gas.</li> <li>4. Aldehyde - Polymerization releases heat.</li> <li>5. 2-aminoethanol, ethylenediamine, Ethylenimine - Mixing in the airtight containers causes elevated temperature and pressure.</li> <li>6. Aluminium nitric acid - Heated may guide and fire.</li> <li>7. Bromine pentafluoride, chlorine trifluoride - May cause intense reaction, fire and explosion.</li> <li>8. Isocyanic phosphate - Intense reaction.</li> <li>9. Phosphorus trichloride - Produce spontaneous-combustion phosphorus, may explode.</li> <li>10. Tertiary butyl potassium - Ignite after mixing for 3 minutes.</li> </ol>



11. Xylene - May produce explosive mixtures.
12. Most metals (stainless steel, aluminum, nickel and alloy) have strong corrosion related to the concentration, temperature, purity.

Conditions to avoid: Higher than 39°C, open flames, statics, sparks and ignition sources.

Materials to avoid: Strong oxidant, strong alkalizes most metals, aldehyde, aminoethanol, bromine pentafluoride, chlorine trifluoride, isocyanic phosphate, phosphorus trichloride, tertiary butyl potassium.

Hazardous decomposition products: -

## Section 11. Toxicological Information

Exposure Route: Skin, inhalation, ingestion, eye.

Symptoms: Irritation, bronchitis, lung pleural effusion, burning, blood spitting, renal damage, conjunctivitis, enamel erosion.

Acute toxicity:

- Inhalation: High-concentration vapors inhalation will irritate nose and throat, and cause short breath, cough, asthma and lung damage.
- Skin:
  1. High-concentration solution or pure acetic acid will cause corrosive tissue damages of deep burning, organic necrosis and persistent scars.
  2. Low-concentration solution will cause slight to severe irritation.
- Eyes:
  1. Will cause the serious irritation even if it is a diluted solution.
  2. The solution will corrode eyes and cause permanent injury, including blindness.
- Ingestion:
  1. 100~200 mL ingestion of 80~100% acetic acid causes severe corrosive injury to digestive tract and stomach.
  2. Event a small amount of inhalation causes fatal lung edema. It may cause severe lung injury, respiratory failure, heartbeat stop and death.
- LD<sub>50</sub> (animal test, entry): 3,530 mg/kg (rat, swallow)
- LD<sub>50</sub> (animal test, entry): 1,060 mg/kg (rabbit, skin)
- LC<sub>50</sub> (animal test, entry): 16,000 ppm/4 hour(s) (rat, inhalation)
- 525 mg/open test (rabbit, skin): cause sever irritation.
- 50 mg/24 hour(s) (rabbit, skin): cause mild irritation.

Chronic / Long-term toxicity:

1. Inhalation: Vapors will cause chronic irritation of nose, pharyngeal and trachea.
2. Skin: Frequent-exposure causes irritation, skin thickness and darkness.
3. Eye: Vapors irritate eyes (conjunctivitis) chronically.
4. Tooth: Vapors will cause enamel erosion of the front and canine teeth.



- Acetic acid will not accumulate and store in the body. It is normal component and metabolize rapidly.

## Section 12. Ecological Information

Ecological toxicity:

- LC<sub>50</sub> (fish): 75 ~ 88 mg/L/96 hour(s)
- EC<sub>50</sub> (aquatic invertebrates): 32 mg/L/48 hour (water fleas)
- Bioconcentration factor (BCF): <1

Persistence and degradability:

- The existence of acetic acid spreads all over the whole nature as general metabolites of animals and plants.
- When released into the air, this material may react with photochemically produced hydroxyl radicals.
  - Half-life (Air): -
  - Half-life (Water surface): -
  - Half-life (Groundwater): -
  - Half-life (Soil): -

Bioaccumulative potential: Acetic acid may biodegrade in the soil and water quickly.

Mobility in soil: Acetic acid may evaporate in the atmosphere via the dry surface of soil.

Other adverse effects: -

## Section 13. Disposal Considerations

Waste disposal:

- Consult references to regulations.
- Adopt particular incineration or sanitary burying.

## Section 14. Transport Information

United Nations Number (UN No.): 2789

UN Proper Shipping Name: Acetic acid, Glacial acetic acid, heavier than 80% (acid)

Transport Hazard classes: 8 (3)

Packaging Group: II

Marine pollutant (Yes/No): No

Specific Transport Measures and Precautionary Conditions: -

## Section 15. Regulatory Information

Applicable Regulations:

- Labor Safety and Health Law.
- Regulation of Labeling and Hazard Communication of Dangerous and Harmful Materials.

3. Organic solvent poisoning prevention rules.
4. Harmful substances concentration permission standards in the labor working environment.
5. Road Traffic Safety Rules.
6. Industrial waste storage and disposal facilities standard.
7. Public dangerous goods and High-pressure flammable gas setting standards & Safety management approach.

**Section 16. Other Information**

References	1. CHEMINFO database, CCINFO CD-RAW, 2005-1 2. RTECS database, TOMES PLUS CD-RAW, Vol.63, 2005 3. ChemWatch database, 2004-4
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Revision Date	2022/09/01
Notes	The symbol " - " in this sheet indicates no available information; the symbol " / " indicates the information is not applicable to the substance.