1. Identification of the substance/preparation and of the company/undertaking

1.1 Identification of the product:
Product number: A1020
Name of material: Acetic acid glacial
CAS No.: 64-19-7

1.2 Recommended use and restriction on use
General use : for experimental, research and industrial use
Restriction on use : Never drink, Not used except for experimental, research and industrial applications.

2. Hazards identification

2.1 GHS Classification
Flammable liquids: Category3
Corrosive to metals: Category1
Acute toxicity (dermal): Category4
Skin corrosion/irritation: Category1A
Serious eye damage/irritation: Category1
Specific target organ toxicity (Single exposure): Category3 (Respiratory tract irritation)

2.2 GHS label elements
Hazard symbols

Signal words : Danger
Hazard statements
H226 Flammable liquid and vapour
H290 May be corrosive to metals
H312 Harmful in contact with skin
H314 Causes severe skin burns and eye damage
H318 Causes serious eye damage
H335 May cause respiratory irritation.
Precautionary statements
P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P233 Keep container tightly closed.
P234 Keep only in original container.
P240 Ground/bond container and receiving equipment.
P241 Use explosion-proof electrical/ventilating/lighting/equipment.
P242 Use only non-sparking tools.
P243 Take precautionary measures against static discharge.
P260 Do not breathe gas/mist/vapours/spray.
P261 Avoid breathing gas/mist/vapours/spray.
P264 Wash hands thoroughly after handling.
P271 Use only outdoors or in a well-ventilated area.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P301+P330+P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P302+P352 IF ON SKIN: Wash with plenty of soap and water.
P303+P361+P353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304+P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
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.
P312 Call a POISON CENTER or doctor/physician if you feel unwell.
P321 Specific treatment
P363 Wash contaminated clothing before reuse.
P370+P378 In case of fire: Use Suitable extinguishing media for extinction (Refer Section MSDS 5).
P390 Absorb spillage to prevent material damage.
P403+P233 Store in a well-ventilated place. Keep container tightly closed.

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P403+P235 Store in a well-ventilated place. Keep cool.
P405 Store locked up.
P406 Store in corrosive resistant container with a resistant inner liner.
P501 Dispose of contents/container in accordance with local/regional/national/international regulation

2.3 Other hazards which do not result in classification : (NFPA Classification)
NFPA grade (0 ~ 4 level)
- Health : 2 , Flammability : 2, Reactivity : 0

3. Composition/information on ingredients

Chemical Name	Synonyms	CAS Number	Concentration %
Acetic acid	-	64-19-7	100

4. First aid measures

4.1. Eye contact
- Do not rub your eyes.
- Immediately flush eyes with plenty of water for at least 15 minutes and call a doctor/physician.
- Get medical attention immediately.
- Remove contact lenses if worn.

4.2. Skin contact
- Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.
- Wash contaminated clothing thoroughly before re-using.
- Get medical attention immediately.
- Wash thoroughly after handling.

4.3 Inhalation contact
- When exposed to large amounts of steam and mist, move to fresh air.
- Take specific treatment if needed.
- Get medical attention immediately.

4.4. Ingestion contact
- Please be advised by doctor whether induction of vomit is demanded or not.
- Rinse your mouth with water immediately.
- Get medical attention immediately.

4.5. Delayed and immediate effects and also chronic effects from short and long term exposure
- Not available

4.6 Notes to physician
- Notify medical personnel of contaminated situations and have them take appropriate protective measures.

5. Fire-fighting measures

5.1 Suitable (Unsuitable) extinguishing media
- Dry chemical, carbon dioxide, regular foam extinguishing agent, spray
- Avoid use of water jet for extinguishing

5.2 Specific hazards arising from the chemical
- Not available

5.3 Special protective actions for firefighters
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- In case of conflagration, use automatic fire sprinkler. Major fire may require withdrawal, allowing the object itself to burn.
- Avoid inhalation of materials or combustion by-products.
- Do not access if the tank on fire.
- Use appropriate extinguishing measure suitable for surrounding fire.
- Keep containers cool with water spray.
- Vapor or gas is burned at distant ignition sources can be spread quickly.
- Due to the extremely low flash point, irrigating fire extinguishing may be less effective when put out a fire.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
- Must work against the wind, let the upwind people to evacuate.
- Do not touch spilled material. Stop leak if you can do it without risk.
- Handle the damaged containers or spilled material after wearing appropriate protective equipment
- Do not direct water at spill or source of leak.

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- Avoid skin contact and inhalation.

6.2 Environmental precautions

- Prevent runoff and contact with waterways, drains or sewers.
- If large amounts have been spilled, inform the relevant authorities.

6.3 Methods and materials for containment and cleaning up

- Large spill : Stay upwind and keep out of low areas. Dike for later disposal.
- Notification to central government, local government. When emissions at least of the standard amount
- Dispose of waste in accordance with local regulation.
- Appropriate container for disposal of spilled material collected.
- Small leak: sand or other non-combustible material, please let use absorption.
- Wipe off the solvent.
- Dike for later disposal.
- Do not use plastic containers.

7. Handling and storage

7.1 Precautions for safe handling

- Avoid direct physical contact.
- Since emptied containers retain product residue (vapor, liquid, solid) follow all MSDS and label warnings even after container is emptied.
- Comply with all applicable laws and regulations for handling
- Dealing only with a well-ventilated place.
- Do not inhale the steam prolonged or repeated.
- Avoid contact with heat, sparks, flame or other ignition sources.
- Avoid contact with strong oxidizing agent.

7.2 Conditions for safe storage, including any incompatibilities

- Store according to current laws and regulations
- Do not apply any physical shock to container.
- Avoid direct sunlight.
- Keep in the original container.
- Please pay attention to incompatibilities materials and conditions to avoid.
- Collected them in sealed containers.
- Do not store in metal containers.

8. Exposure controls/personal protection

8.1 Exposure limits

ACGIH TLV

- [Acetic acid] : TWA 10 ppm (25 mg/m3) STEL, 15 ppm (37 mg/m3)

OSHA PEL

- [Acetic acid]:10ppm 25mg/m3

8.2 Engineering controls

Business owner is recommended to maintain below recommended exposure limits for the working place with general exhaust of gas/vapour/mist/fume.

8.3 Individual protection measures, such as personal protective equipment

Respiratory protection

- Under conditions of frequent use or heavy exposure. Respiratory protection may be needed.
- Respiratory protection is ranked in order from minimum to maximum.
- Consider warning properties before use.
- Any chemical cartridge respirator with organic vapor cartridge(s).
- Any chemical cartridge respirator with a full facepiece and organic vaporcartridge(s).
- Any air-purifying respirator with a full facepiece and an organic vapor canister.
- For Unknown Concentration or Immediately Dangerous to Life or Health: Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply. Any self-contained breathing apparatus with a full facepiece.

Eye protection

- Wear primary eye protection such as splash resistant safety goggles with a secondary protection face shield.
- Provide an emergency eye wash station and quick drench shower in the immediate work area.

Hand protection

- Wear appropriate chemical resistant glove.

Skin protection

- Wear appropriate chemical resistant protective clothing.

Others

- Not available

9. Physical and chemical properties

A. Appearance	
- Appearance	Liquid
- Color	Not available
B. Odor	characteristic
C. Odor threshold	24.3 ppm (gas in air)
D. pH	2.4 (1.0M solution)
E. Melting point/Freezing point	17 ℃
F. Initial Boiling Point/Boiling Ranges	118 ℃
G. Flash point	39 ℃
H. Evaporation rate	0.97 (n-butyl acetate=1)
I. Flammability (solid, gas)	Not available
J. Upper/Lower Flammability or explosive limits	19.9 / 4.0 %
K. Vapour pressure	21hPa (25℃)
L. Solubility	100 g/100 ml (25℃)
M. Vapour density	2.07 (air=1)
N. Specific gravity (Relative density)	1.05
O. Partition coefficient of n-octanol/water	-0.17 (= log Pow)
P. Autoignition temperature	427 ℃
Q. Decomposition temperature	Not available
R. Viscosity	1.056 cp (25 ℃)
S. Molecular weight	60.05

10. Stability and reactivity

10.1 Chemical Stability
- Stable under normal conditions of use and storage.

10.2 Possibility of hazardous reactions
- Cylinders exposed to fire may vent and release flammable gas.
- May be corrosive to metals.

10.3 Conditions to avoid
- Avoid contact with incompatible materials and condition.
- Avoid: Accumulation of electrostatic charges, Heating, Flames and hot surfaces
- Avoid contact with heat, sparks, flame or other ignition sources.
- Avoid contact with metals.

10.4 Incompatible materials
- Avoid contact with strong oxidizing agent and strong reducing agent.

10.5 Hazardous decomposition products
- May emit flammable vapour if involved in fire.

11. Toxicological information

11.1 Information on the likely routes of exposure

Respiratory tracts
- May cause respiratory irritation.

Oral
- Not available

Eye · Skin
- Causes serious eye damage
- Causes severe skin burns and eye damage

11.2 Delayed and immediate effects and also chronic effects from short and long term exposure

Acute toxicity

*** Oral**
- [Acetic acid]: LD50 = 3310 mg/kg Rat (NITE)

*** Dermal**
- [Acetic acid]: LD50 = 1060 mg/kg rabbit (NITE)

*** Inhalation**
- [Acetic acid]: LC50 = 39.3 mg/l/4 hr Rat (NLM)

Skin corrosion/irritation
- Causes severe skin burns and eye damage

Serious eye damage/irritation
- Causes serious eye damage

Respiratory sensitization
- Not available

Skin sensitization
- Not available

Carcinogenicity

*** IARC**
- Not available

*** OSHA**
- Not available

*** ACGIH**
- Not available

*** NTP**
- Not available

*** EU CLP**
- Not available

Germ cell mutagenicity
- Not available

Reproductive toxicity
- Not available

STOT-single exposure
- May cause respiratory irritation.

STOT-repeated exposure
- Not available

Aspiration hazard
- Not available

12. Ecological information

12.1. Ecotoxicity

Fish
- [Acetic acid]: ECHA LC50 >1000 mg/l 96 hr Oncorhynchus mykiss (OECD TG 203, GLP)

Crustaceans
- [Acetic acid]: ECHA EC50 >300.82 mg/l 48 hr Daphnia magna (OECD TG 202, GLP)

Algae
- [Acetic acid]: ECHA EC50 >1000 mg/l 72 hr Skeletonema costatum(ISO 10253, GLP)

12.2 Persistence and degradability

Persistence
- [Acetic acid]: log Kow -0.17 (Howard, 1997)

Degradability
- Not available

12.3 Bioaccumulative potential

Bioaccumulative potential
- Not available

Biodegration
- [Acetic acid]: 96% 20 day (ECHA), Biodegradability = 74 (%) (NITE)

12.4 Mobility in soil
- [Acetic acid]: 1.153 Koc (TGD guideline, QSAR) (ECHA)

12.5 Other adverse effects
- Not available

13. Disposal considerations

13.1 Disposal methods
- Since more than two kinds of designated waste is mixed, it is difficult to treat separately, then can be reduction or stabilization by incineration or similar process.
- If water separation is possible, pre-process with water separation process.
- Dispose by incineration.

13.2 Special precautions for disposal
- The user of this product must dispose by oneself or entrust it to a waste disposer, a person who recycles other's waste or establishes and operates waste disposal facilities.
- Dispose of waste in accordance with all applicable laws and regulations.

14. Transport information

14.1 UN No. (IMDG CODE/IATA DGR)
- 2789

14.2 Proper shipping name
- ACETIC ACID, GLACIAL OR ACETIC ACID SOLUTION, WITH MORE THAN 80 PERCENT ACID, BY MASS

14.3 Hazard Class
- 8

14.4 IMDG CODE/IATA DGR Packing group
- II

14.5 Marine pollutant
- Not applicable

14.6 Special precautions for user related to transport or transportation measures
- Local transport follows in accordance with Dangerous goods Safety Management Law.
- Package and transport follow in accordance with Department of Transportation (DOT) and other regulatory agency requirements.
- EmS FIRE SCHEDULE: F-E (Non-water-reactive flammable liquids)
- EmS SPILLAGE SCHEDULE: S-C (Flammable corrosive liquids)

15. Regulatory information

15.1 National and/or international regulatory information

POPs Management Law
- Not applicable

Information of EU Classification

*** Classification**
- [Acetic acid]: H226, H314

U.S. Federal regulations

*** OSHA PROCESS SAFETY (29CFR1910.119)**
- Not applicable

*** CERCLA Section 103 (40CFR302.4)**
- [Acetic acid]: 2267.995 kg 5000 lb

*** EPCRA Section 302 (40CFR355.30)**
- Not applicable

*** EPCRA Section 304 (40CFR355.40)**
- Not applicable

*** EPCRA Section 313 (40CFR372.65)**
- Not applicable

Rotterdam Convention listed ingredients
- Not applicable

Stockholm Convention listed ingredients
- Not applicable

Montreal Protocol listed ingredients
- Not applicable

16. Other information

Reason for the revision: General update.
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Date: 06/03/2020

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