established in 1981
megaloid laboratories

5515 North Service Rd. #306
Burlington, Ontario L7L 6G4

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1. PRODUCT IDENTIFICATION

Name: ***Acetic Acid, glacial***

Synonyms: *ethanoic acid, methanecarboxylic acid*

CAS# *64-19-7*

Product Uses: *manufacture of cellulose acetate, vinyl acetate and a variety of acetate esters*

Supplier Identifier:
Megaloid Laboratories Limited
5515 North Service Road, Suite 306
Burlington, Ontario, Canada
L7L 6G4
Phone: 905-337-7411 / Fax: 905-337-1686

EMERGENCY INFORMATION ***Call CHEMTREC - (800) 424-9300 (CCN693764)***

2. HAZARDS

GHS Class *(category)*	***Flammable*** *(3)*	***Metal corrosive*** *(1)*	***Skin corrosive*** *(1)*	***STOT*** *(3)*
Signal Word	***DANGER***			
Hazard Statements	*flammable liquid & vapour (H225)*	*May be corrosive to metals (H290)*	*Causes severe skin burns & eye damage (H314)*	*May cause respiratory tract irritation (H335)*

Label Pictograms

GHS Precautionary Statements for Labelling

Prevention

P210	Keep away from heat, sparks, open flames and hot surfaces. No smoking.
P233	Keep container tightly closed.

P240	Ground or bond container and receiving equipment.
P241	Use explosion-proof electrical, ventilating and lighting equipment.
P242	Use only non-sparking tools.
P243	Take precautionary measures against static discharge.
P261	Avoid breathing vapours.
P264	Wash hands thoroughly after handling.
P280	Wear eye protection, protective gloves and clothing of butyl rubber
Response	
P301, P330, P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting..
P303, P361, P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304, P340	IF INHALED: remove person to fresh air and keep comfortable for breathing.
P305, P351, P338	IF IN EYES: rinse continuously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.
P312	Call a POISON CENTRE or doctor if you feel unwell.
P363	Wash contaminated clothing before reuse.
Storage	
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.
Disposal	
P501	Dispose of contents and container in accordance with local, regional, national and international regulations.

3. COMPOSITION

Chemical Name:	CAS No.	%	Other Identifiers
Acetic Acid	*64-19-7*	*100*	*EC # 200-580-7*

4. FIRST AID

Inhalation

Remove from contaminated area promptly. CAUTION: Rescuer must not endanger himself! If breathing stops, administer artificial respiration and seek medical aid promptly.

Skin Contact

Wash with plenty of water. Remove contaminated clothing and do not reuse until thoroughly laundered.

Eye Contact

Wash eyes with plenty of water, holding eyelids open. Seek medical assistance if there is any irritation.

Ingestion

Give plenty of water to dilute product. Do not induce vomiting (NOTE below). Keep victim quiet. If vomiting occurs, lower victim's head below hips to prevent inhalation of vomited material. Seek medical help promptly.

First-aid Comments
Inadvertent inhalation of vomited material may seriously damage the lungs. The danger of this is greater than the risk of poisoning through absorption of this relatively low-toxicity substance. The

stomach should only be emptied under medical supervision, and after the installation of an airway to protect the lungs.

5. FIRE FIGHTING & FLAMMABILITY

Extinguishing Media

Suitable Extinguishing Media

Foam, dry chemical, water fog, water spray.

Combustion Products

Carbon monoxide, nitrogen oxides, unburnt acid, part oxidized hydrocarbon fragments
Cannot accumulate a static charge on agitation or pumping.

Special Protective Equipment and Precautions for Fire-fighters

Firefighters must wear SCBA. Fire-fighters may enter the area if positive pressure SCBA and full Bunker Gear is worn.

6. ACCIDENTAL RELEASE MEASURES

Summer Fire Potential:
under hot conditions, blanket spill with foam as a precaution against accidental ignition. Take care to avoid sparks – do not operate (turn on OR off) electrical appliances near spill, unless explosion proof.

Personal Precautions, Protective Equipment, and Emergency Procedures

Wear appropriate personal protective equipment. Local authorities should be advised if significant spillages cannot be contained.

Environmental Precautions

Avoid release to the environment. If the spill is inside a building, prevent product from entering drains, ventilation systems and confined areas.

Methods and Materials for Containment and Cleaning Up

Leak Precaution: dyke to control spillage and prevent environmental contamination

Handling Spill: Ventilate contaminated area; recover free liquid with suitable pumps; absorb residue on an inert sorbent, sweep & pick up using plastic or aluminium shovel, & store in closed containers for recycling or disposal.

Other Information

Report spills to local health, safety and environmental authorities, as required.

7. HANDLING & STORAGE

Precautions for Safe Handling

Avoid generating or breathing product vapour. Ensure adequate exhaust ventilation. If dealing with a spill, thoroughly ventilate area AND wear a suitable respirator with organic vapour, acid gas cartridge.
Avoid all contact with skin & wash work clothes frequently. An eye bath and safety shower must always be available near the workplace.
Corrosive to many metals, particularly steel. Although glacial acetic acid may be safe in contact with aluminium, even slight dilution with water triggers corrosion. Attacks many elastomers & types of rubber – test before exposing.
Never cut, drill, weld or grind on or near this container.

Conditions for Safe Storage

Store below 40°C, but above 17°C. Keep away from sources of ignition & substances listed in Part X. Keep containers tightly sealed unless in use. Acetic Acid may be a fire risk on hot summer days.

In summer, avoid sparks & use non-sparking bronze or aluminium hand tools. Explosion-proof electrical & mechanical equipment (lighting, switchgear, forklift trucks, etc.) are recommended.

8. EXPOSURE CONTROL & PERSONAL PROTECTION

Ontario TWAEV	*10ppm / 25mg/m^3*	**Ontario STEV**	*15ppm / 37mg/m^3*
ACGIH TLV	*10ppm / 25mg/m^3*	**ACGIH STEL**	*15ppm / 37mg/m^3*
OSHA PEL	*10ppm / 25mg/m^3*	**OSHA STEL**	*Not listed*

Ventilation	*Mechanical ventilation may be required to control airborne titre to regulated limits; a respirator with organic vapour, acid gas cartridge must be available for escape purposes for workers should containment fail (store respirators in airtight containers [eg: "Tupperware"] to maintain cartridge "freshness")*
Hands	*Butyl gloves recommended – other types may also protect; consult supplier to confirm suitability*
Eyes	*Safety glasses with side shields – always protect the eyes*
Clothing	*Wear impermeable (above) apron, boots, & long sleeves if there is any danger of splashing*

Appropriate Engineering Controls
Engineering measures: Ensure adequate ventilation.

Respiratory protection: Use respiratory protection unless adequate local exhaust ventilation is provided or exposure assessment demonstrates that exposures are within recommended exposure guidelines.

Protective measures: Remove respiratory and skin/eye protection only after vapours have been cleared from the area. Ensure that eye flushing systems and safety showers are located close to the working place. Use personal protective equipment as required.

9. PHYSICAL PROPERTIES

Appearance	*Clear colourless liquid. Absorbs moisture from the air.*
Odour	*Vinegar*
Odour threshold	*0.07 ppm (0.17 mg/m3) – geometric mean*
pH	*2.4 (6% solution) – highly acid*
Melting Point/Freezing Point	*16.6 ºC (61.9 ºF)*
Initial Boiling Point/Range	*118 ºC (244 ºF)*
Flash Point	*39 ºC (102 ºF) (closed cup)*
Evaporation Rate	*1 (Butyl Acetate =1)*
Flammability (Solid, Gas)	*Not Available*
Upper/Lower Flammability or Explosive Limit	*16% (upper); 4% (lower)*
Vapour Pressure	*11.4mmHg / 1.52kPa (20ºC / 68ºF)*

Vapour Density (air = 1)	*2.1*
Relative Density (water = 1)	*1.05 at 20 ºC (68ºF)*
Solubility	*Very soluble in water; Also soluble in acetone, diethyl ether, glycerol, benzene*
Partition Coefficient, n-Octanol/Water (Log Kow)	*Not available*
Auto-ignition Temperature	*463 ºC (865 ºF) – higher values also reported*
Conversion Factor	*1ppm = 2.45mg/m^3*
Viscosity	*1.22centipoise (20ºC / 68ºF)*
Physical State	*Liquid*
Molecular Weight	*60 grams per mole*
Molecular Formula	*C2-H4-O2*

10. REACTIVITY

Dangerously Reactive *strong oxidising agents; strong alkalies; ignites with ammonium nitrate.*

Also Reactive *with reacts with most metals (except aluminium) to produce hydrogen gas; reacts with phosphorus trichloride, phosphorus isocyancate, bromine pentafluoride & chlorine trifluoride.*

Chemical Stability
Stable; will not normally polymerize – polymerises with acetaldehyde.

Decomposes in Presence of
Not known

Decomposition Products
None apart from Hazardous Combustion Products

Mechanical Impact
Not sensitive

11. TOXICITY

Acute Toxicity	
LD_{50} (oral)	*3310 & 3530mg/kg (rat); 4960mg/kg (mouse), 1200mg/kg (rabbit)*
LD50 (skin)	*1060 & 1590mg/kg (rabbit), 3300mg/kg (guinea pig)*
LC50 (inhalation)	*4490, 4653, 6500 & 16,000ppm (rat), 2810ppm (mouse)*

Skin Corrosion/Irritation
Concentrated product severely corrosive to tissue; may cause permanent scarring; less corrosive with dilution – 10% is only slightly irritating

Serious Eye Damage/Irritation

Corrosive to eyes; permanent scarring of cornea & blindness; irritating even when diluted below 10%

STOT (Specific Target Organ Toxicity) - Single Exposure

Inhalation
Irritating; may cause bronchoconstriction (may be delayed 1-2hr) & difficult breathing; in several cases, airway hypersensitivity persisted for years after inhalation
Skin Absorption
Unlikely; severe local tissue damage probably prevents absorption.
Ingestion
Severely corrosive to mouth, throat & stomach – not a route of industrial exposure – less corrosive with dilution. (Household vinegar is 5-10% acetic acid)

STOT (Specific Target Organ Toxicity) - Repeated Exposure
Several reports of long-lasting bronchial hyper-reactivity following years of exposure to acetic acid vapour; rodents exposed to vapour lost appetite.

Respiratory and/or Skin Sensitization
Not a sensitizer in humans or animals.
Carcinogenicity
Not a carcinogen. IARC: Not specifically listed. ACGIH®: Not specifically designated. NTP: Not specifically listed. OSHA: Not specifically listed.

Reproductive Toxicity
Development of Offspring
No known effect in humans or animals.
Sexual Function and Fertility
No known effect in humans or animals.
Germ Cell Mutagenicity
No known effect in humans or animals.

12. ECOLOGICAL INFORMATION

Bioaccumulation	*readily metabolised by all living plants & animals; cannot bio accumulate*
Persistence and Degradability	***Biodegradation -*** *diluted, acetic acid biodegrades readily & very rapidly in the presence of oxygen; 40% in 24 hours, 58% in 5 days, 96% in 20 days* ***Abiotic Degradation -*** *acetic acid reacts with atmospheric hydroxyl radicals; estimated ½-life in air is 22 days; rain readily & rapidly knocks down any vapour, making it available to biodegradation*
Mobility in soil, water	*water soluble; moves readily in soil & water; soil biota may metabolise it before it reaches an aquifer*
Aquatic Toxicity	
LC50 (Fish, 96hr)	*75mg/litre (Lepomis macrochirus), 251mg/litre (Gambusia affinis, neutralised to pH 6.9-8.7) 88mg/litre (Pimephelas promelas), 410mg/litre (Leuciscus idus)*
EC50 (Crustacea, 48hr)	*6000mg/litre (Daphnia magna), 42mg/litre (Artemia salina)*
EC100 (Algae, 96hrs)	*720mg/litre (Euglena gracilis), 63mg/litre (Chlamydomonas dysomos)*
LC_{50} (Microorganisms)	*11mg/litre (Photobacterium phosphoreum)*

13. DISPOSAL

Water Disposal

Do not flush to sewer, may be incinerated in approved facility with flue gas monitoring & scrubbing; may be used to neutralize alkaline waste; *biological destruction is an excellent alternative*

Containers

Drums should be reused. Recondition and pressure test by a licensed reconditioner prior to re-use.

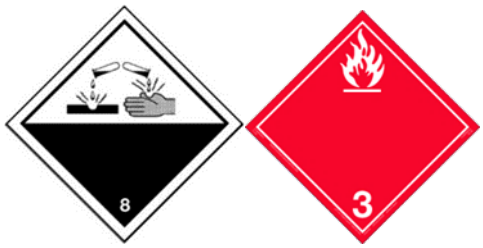
Pails must be vented and thoroughly dried prior to crushing and recycling.

IBCs (intermediate bulk containers): polyethylene bottle must be pressure tested & recertified at 30 months. Replace at 60 months (5yrs).

Steel containers must be inspected, pressure tested & recertified every 5 years.

Never cut, drill, weld or grind on or near this container, even if empty

14. TRANSPORT CLASSIFICATION

Canada TDG	**PIN**	UN2789	
AND	**Shipping Name**	Acetic Acid, glacial	
U.S.A. 49 CFR	**Class & Packing Group**	8(3), PG II	

Marine Pollutant	Not a Marine Pollutant	
ERAP Required	3000kg	
Reportable Quantity	5000lbs	
E R G No.	132	

Important Note: ***Shipping descriptions may vary based on mode of transport, quantities, package size, and/or origin and destination. Consult your company's Hazardous Materials/Dangerous Goods expert for information specific to your situation.***

15. REGULATIONS

Canada DSL	On Inventory
U.S.A. TSCA	On Inventory
Europe EINECS	On Inventory

Canadian Regulations

CEPA - National Pollutant Release Inventory (NPRI)

Not specifically listed.

U.S.A. Regulations

Immediately Dangerous to Life or Health: 50 ppm

Allowable Tolerances: Residues of acetic acid are exempted from the requirement of a tolerance when used as a catalyst in accordance with good agricultural practices as inert (or occasionally active) ingredients in pesticide formulations applied to growing crops or to raw agricultural

commodities after harvest. Residues of acetic acid are exempted from the requirement of a tolerance when used as a catalyst (Limit: not more than 0.5% of pesticide formulation) in accordance with good agricultural practices as inert (or occasionally active) ingredients in pesticide formulations applied to animals.
OSHA Standards: Permissible Exposure Limit: Table Z-1 8-hr Time Weighted Avg: 10 ppm (25 mg/cu m).
NIOSH Recommendations: Recommended Exposure Limit: 10 Hr Time-Weighted Avg: 10 ppm (25 mg/cu m).
Recommended Exposure Limit: 15 Min Short-Term Exposure Limit: 15 ppm (37 mg/cu m).
Threshold Limit Values: 8 hr. Time Weighted Avg (TWA): 10 ppm; 15 min Short Term Exposure Limit (STEL): 15ppm.
Atmospheric Standards: This action promulgates standards of performance for equipment leaks of Volatile Organic Compounds (VOC) in the Synthetic Organic Chemical Manufacturing Industry (SOCMI). The intended effect of these standards is to require all newly constructed, modified, and reconstructed SOCMI process units to use the best demonstrated system of continuous emission reduction for equipment leaks of VOC, considering costs, non-air quality health and environmental impact and energy requirements. Acetic acid is produced, as an intermediate or a final product, by process units covered under this subpart.
Clean Water Act Requirements: Acetic acid is designated as a hazardous substance under section 311(b) (2)(A) of the Federal Water Pollution Control Act and further regulated by the Clean Water Act Amendments of 1977 and 1978. These regulations apply to discharges of this substance. This designation includes any isomers and hydrates, as well as any solutions and mixtures containing this substance.
CERCLA Reportable Quantities: Persons in charge of vessels or facilities are required to notify the National Response Centre (NRC) immediately, when there is a release of this designated hazardous substance, in an amount equal to or greater than its reportable quantity of 5000 lb or 2270 kg. The toll free number of the NRC is (800) 424-8802; In the Washington D.C. metropolitan area (202) 426-2675. The rule for determining when notification is required is stated in 40 CFR 302.4 (section IV. D.3.b).
TSCA Requirements: Section 8(a) of TSCA requires manufacturers of this chemical substance to report preliminary assessment information concerned with production, exposure, and use to EPA as cited in the preamble in 51 FR 41329.
FIFRA Requirements: Residues of acetic acid are exempted from the requirement of a tolerance when used as a catalyst in accordance with good agricultural practices as inert (or occasionally active) ingredients in pesticide formulations applied to growing crops or to raw agricultural commodities after harvest. Residues of acetic acid are exempted from the requirement of a tolerance when used as a catalyst (Limit: not more than 0.5% of pesticide formulation) in accordance with good agricultural practices as inert (or occasionally active) ingredients in pesticide formulations applied to animals. New Active Ingredients ... includes pesticide active ingredients initially registered after November 1, 1984, that currently have active product registrations. By law, these newer pesticides are not subject to the reregistration program. They must, however, meet the new safety standard of the FQPA, and will be reviewed on a 15-year cycle under the registration review program. ... Active Ingredient Number: 044001; Type of Pesticide: bio pesticide-herbicide; Use Site: non-food use (ornamental turf); Year: 1997.
FDA Requirements: The Approved Drug Products with Therapeutic Equivalence Evaluations List identifies currently marketed prescription drug products, incl acetic acid, approved on the basis of safety and effectiveness by FDA under sections 505 of the Federal Food, Drug, and Cosmetic Act. Substance added directly to human food affirmed as generally recognized as safe (GRAS). Acetic acid used as a general purpose food additive in animal drugs, feeds, and related products is generally recognized as safe when used in accordance with good manufacturing or feeding practice.

16. OTHER INFORMATION

NFPA RATING	Health 3	Flammability 2	Instability 0

Prepared for *Megaloid Laboratories Limited* **by** *Richard Koscher*

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Key to Abbreviations	ACGIH® = American Conference of Governmental Industrial Hygienists AIHA® = AIHA® Guideline Foundation HSDB® = Hazardous Substances Data Bank IARC = International Agency for Research on Cancer NFPA = National Fire Protection Association NIOSH = National Institute for Occupational Safety and Health NTP = National Toxicology Program OSHA = US Occupational Safety and Health Administration RTECS® = Registry of Toxic Effects of Chemical Substances
References	CHEMINFO database. Canadian Centre for Occupational Health and Safety (CCOHS). HSDB® database. US National Library of Medicine. Available from Canadian Centre for Occupational Health and Safety (CCOHS). NIOSH Pocket Guide database. National Institute for Occupational Safety and Health. Available from Canadian Centre for Occupational Health and Safety (CCOHS). Registry of Toxic Effects of Chemical Substances (RTECS®) database. Dassault Systèmes/BIOVIA ("BIOVIA"). Available from Canadian Centre for Occupational Health and Safety (CCOHS).
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