



Safety Data Sheet

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

Product identifier:

Product name: 0.1mol/L(N/10)-Perchloric acid(acetic acid solution)

SDS No. : A0050E-2

Details of the supplier of the safety data sheet

Manufacturer/Supplier: KISHIDA CHEMICAL CO., LTD.

Address: 3-1, Honmachibashi, Chuo-ku, Osaka, JAPAN

Division: Safety Management Dept. of Chemicals

Telephone number: +81-6-6946-8061

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2. Hazards identification

GHS classification and label elements of the product

Classification of the substance or mixture

PHYSICAL AND CHEMICAL HAZARDS

Flammable liquids: Category 3

HEALTH HAZARDS

Acute toxicity (Dermal): Category 4

Skin corrosion/irritation: Category 1

Serious eye damage/eye irritation: Category 1

Carcinogenicity: Category 2

Specific target organ toxicity – single exposure: Category 1(blood; respiratory apparatus/system)

Specific target organ toxicity – repeated exposure: Category 2(thyroid gland)

ENVIRONMENT HAZARDS

Hazardous to the aquatic environment (Acute): Category 3

(Note) GHS classification without description: Not classified/Classification not possible

Label elements



Signal word: Danger

HAZARD STATEMENT

Flammable liquid and vapor

Harmful in contact with skin

Causes severe skin burns and eye damage

Causes serious eye damage

Suspected of causing cancer

Causes damage to organs after single exposure(blood; respiratory apparatus/system)

May cause damage to organs through prolonged or repeated exposure(thyroid gland)

Harmful to aquatic life

PRECAUTIONARY STATEMENT

Prevention

Avoid release to the environment.

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

Keep container tightly closed.



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Ground/bond container and receiving equipment.
Use explosion-proof electrical/ventilating/lighting equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Do not breathe dust/fume/gas/mist/vapors/spray.
Wash contaminated parts thoroughly after handling.
Wear protective gloves/protective clothing/eye protection/face protection.
Do not eat, drink or smoke when using this product.

Response

In case of fire: Use appropriate media other than water for extinction.
Get medical advice/attention if you feel unwell.
IF exposed or concerned: Get medical advice/attention.
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
IF ON SKIN: Wash with plenty of soap and water.
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
Take off contaminated clothing and wash it before reuse.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

Storage

Store in a well-ventilated place. Keep cool.

Disposal

Dispose of contents/container in accordance with local/national regulation.

Specific Physical and Chemical hazards

Flammable liquid. Vapor/air mixture may explode.

3. Composition/information on ingredients

Mixture/Substance selection:

Mixture

Ingredient name:Acetic acid

Content (%):99

Chemical formula:C2H4O2

Chemicals No, Japan:2-688

CAS No.:64-19-7

MW:60.05

ECNO:200-580-7

Ingredient name:Perchloric acid

Content (%):0.96

Chemical formula:HClO4

Chemicals No, Japan:1-221

CAS No.:7601-90-3

MW:100.46

ECNO:231-512-4

Note : The figures shown above are not the specifications of the product. The content of products may exceed the figures shown above.



4. First-aid measures

Descriptions of first-aid measures

General measures

Get medical attention/advice if you feel unwell.

IF INHALED

Remove person to fresh air and keep comfortable for breathing.

Call a POISON CENTER or doctor/physician if you feel unwell.

IF ON SKIN (or hair)

Take off immediately all contaminated clothing. Rinse skin with water/shower.

Wash with plenty of soap and water.

If skin irritation or rash occurs: Get medical advice/attention.

IF IN EYES

Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

If eye irritation persists: Get medical advice/attention.

IF SWALLOWED

Rinse mouth. Do NOT induce vomiting.

Call a POISON CENTER or doctor/physician if you feel unwell.

5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media

In case of fire, use foam, dry powder, CO₂ to extinguish.

Unsuitable extinguishing media

Indoor firefighting equipment or outdoor firefighting equipment

Sprinkler equipment

Dry-powder firefighting equipment – except for phosphate etc.,hydrogen carbonate etc.

Straight stream water extinguisher

Water mist extinguisher

Reinforcing liquid jet extinguisher

Dry-powder extinguisher – except for phosphate etc.,hydrogen carbonate etc.

Bucket of water or tank of water

Specific hazards arising from the substance or mixture

Containers may explode when heated.

Fire may produce irritating, corrosive and/or toxic gases.

Advice for firefighters

Specific fire-fighting measures

Evacuate non-essential personnel to safe area.

Special protective equipment and precautions for fire-fighters

Wear fire/flame resistant/retardant clothing.

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

Firefighters should wear self-contained breathing apparatus with full face piece operated positive pressure mode.

6. Accidental release measures

Personnel precautions, protective equipment and emergency procedures

Ventilate area until material pick up is complete.

Wear proper protective equipment.

Environmental precautions

Prevent spills from entering sewers, watercourses or low areas.

Methods and materials for containment and cleaning up



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Absorb spill with inert material (dry sand, earth, et al), then place in a chemical waste container.

Preventive measures for secondary accident

Collect spillage.

7. Handling and storage

Precautions for safe handling

Preventive measures

(Exposure Control for handling personnel)

Do not breathe dust/fume/gas/mist/vapors/spray.

(Protective measures against fire and explosion)

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

Ground/bond container and receiving equipment.

Use explosion-proof electrical/ventilating/lighting equipment.

Use only non-sparking tools.

Take precautionary measures against static discharge.

(Exhaust/ventilator)

Exhaust/ventilator should be available.

(Safety treatments)

Avoid contact with skin.

Avoid contact with eyes.

Safety Measures

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

When using do not eat, drink or smoke.

Any incompatibilities

See "10.Stability and Reactivity"

Advice on general occupational hygiene

Wash contaminated parts thoroughly after handling.

Do not eat, drink or smoke when using this product.

Take off contaminated clothing and wash it before reuse.

Storage

Conditions for safe storage

Keep container tightly closed.

Store in a cool, dry place. Do not store in direct sunlight.

Container and packaging materials for safe handling

Glass

8. Exposure controls/personal protection

Control parameters

Adopted value

(Acetic acid)

ACGIH(2003) TWA: 10ppm;

STEL: 15ppm (URT & eye irr; pulm func)

OSHA-PEL

(Acetic acid)

TWA: 10ppm, 25mg/m³

Exposure controls

Appropriate engineering controls

Do not use in areas without adequate ventilation.

Eye wash station should be available.

Washing facilities should be available.

Individual protection measures



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Respiratory protection

Wear respiratory protection.

Hand protection

Wear protective gloves.

Eye protection

Wear eye/face protection.

9. Physical and Chemical Properties

Information on basic physical and chemical properties

Physical state: Liquid

Color: Colorless, Clear

Odor: Irritant odor

pH data is not available.

Boiling point or initial boiling point data is not available.

Boiling range data is not available.

Melting point/Freezing point data is not available.

Decomposition temperature data is not available.

Flammability (gases, liquids and solids) data is not available.

Flash point: (Acetic acid)39°C

Auto-ignition temperature data is not available.

Lower and upper explosion limit/flammability limit data is not available.

Vapor pressure data is not available.

Relative vapor density (Air=1) data is not available.

Density and/or relative density: 1.05g/cm³

Kinematic viscosity data is not available.

Solubility:

Solubility in water: Soluble

n-Octanol/water partition coefficient data is not available.

No Particle characteristics data is not available.

10. Stability and Reactivity

Reactivity

Not available.

Chemical stability

Stable under normal storage/handling conditions.

Possibility of hazardous reactions

(Acetic acid)

The substance is a weak acid. Reacts violently with strong oxidants. This generates fire and explosion hazard. Reacts violently with strong bases, strong acids and many other compounds. Attacks some forms of plastic, rubber and coatings. (ICSC 0363)

(Perchloric acid)

May explode on heating. Decomposes on heating. This produces toxic and corrosive fumes. The substance is a strong oxidant. It reacts violently with combustible and reducing materials, organic materials and strong bases. This generates fire and explosion hazard. Attacks many metals. This produces flammable/explosive gas (hydrogen). The acid is unstable if the concentration is over 72%; may explode by shock or concussion when dry or drying. Mixtures with combustible material (such as paper) may ignite spontaneously at room temperature. (ICSC 1006)

Conditions to avoid

Contact with incompatible materials.

Contact with fire source.

Incompatible materials



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Strong acids, Strong bases, Strong oxidizing agents, Reducing agents, Combustible materials, Organic materials, Metals

Hazardous decomposition products

Carbon oxides, Hydrogen

11. Toxicological Information

Information on toxicological effects

Acute toxicity

Acute toxicity (Oral)

[GHS Cat. Japan, base data]

(Acetic acid)

rat LD50=3310mg/kg (PATTY 5th, 2001)

(Perchloric acid)

rat LD50=1100mg/kg (MOE assessment vol.9, 2011)

Acute toxicity (Dermal)

[GHS Cat. Japan, base data]

(Acetic acid)

rabbit LD50=1060mg/kg (PATTY 5th, 2001)

Irritant properties

Skin corrosion/irritation

[GHS Cat. Japan, base data]

(Acetic acid)

rabbit/guinea pig severe burn (PATTY 5th, 2001 et al)

(Perchloric acid)

human corrosive (MOE risk assessment vol.9, 2011; NICNAS IMAP, Accessed Oct. 2018)

Serious eye damage/irritation

[GHS Cat. Japan, base data]

(Acetic acid)

rabbit permanent corneal damage (IUCLID, 2000 et al)

(Perchloric acid)

skin corrosive/irritation class 1

Allergenic and sensitizing effects data is not available.

Mutagenic effects data is not available.

Carcinogenicity

[GHS Cat. Japan, base data]

(Perchloric acid)

cat.2; (MOE risk assessment vol.9, 2011)

Reproductive toxicity

[GHS Cat. Japan, base data]

(Perchloric acid)

cat. 2; rat : MOE risk assessment vol.9, 2011

STOT

STOT-single exposure

[cat.1]

[GHS Cat. Japan, base data]

(Acetic acid)

blood; respiratory apparatus/system (ACGIH, 2004)

[cat.3 (resp. irrit.)]

[GHS Cat. Japan, base data]

(Perchloric acid)

respiratory tract irritation (MOE risk assessment vol.9, 2011)

STOT-repeated exposure

[cat.1]



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[GHS Cat. Japan, base data]

(Perchloric acid)

thyroid gland (MOE risk assessment vol.9, 2011)

Aspiration hazard data is not available.

12. Ecological Information

Ecotoxicity

Aquatic toxicity

Harmful to aquatic life

Aquatic acute toxicity component(s) data

[GHS Cat. Japan, base data]

(Acetic acid)

Crustacea (Daphnia magna) EC50=65mg/L/48hr (Aquire, 2010)

(Perchloric acid)

Crustacea (Daphnia magna) LC50 = 495mg/L/48hr [490mg ClO₄⁻/L/48hr cal.] (MOE risk assessment vol.9, 2011)

Aquatic chronic toxicity component(s) data

[GHS Cat. Japan, base data]

(Perchloric acid)

Fish (fat head minnow) NOEC ≥ 495 mg/L/35days (≥ 490mg ClO₄⁻/L/35days cal.)(MOE risk assessment vol.9, 2011)

Water solubility

(Acetic acid)

miscible (ICSC, 2010)

(Perchloric acid)

miscible (ICSC, 2000)

Persistence and degradability

(Acetic acid)

BOD_Degradation : 74% (Registered chemicals data check & review)

Bioaccumulative potential

(Acetic acid)

log Pow=-0.17 (PHYSPROP DB, 2005)

Mobility in soil

Mobility in soil data is not available.

Other adverse effects

Ozone depleting chemical data is not available.

13. Disposal considerations

Description of waste residues and information on their safe handling and methods of disposal, including the disposal of any contaminated packaging

Waste treatment methods

Avoid release to the environment (- if this is not the intended use).

Dispose of contents/container in accordance with local/national regulation.

14. Transport Information

UN No.: 2789

Proper Shipping Name :

ACETIC ACID, GLACIAL or ACETIC ACID SOLUTION, more than 80% acid, by mass

Class or division : 8

Subsidiary hazard(s) : 3

Packing group : II



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ERG GUIDE No.: 132

IMDG Code (International Maritime Dangerous Goods Regulations)

UN No.: 2789

Proper Shipping Name :

ACETIC ACID, GLACIAL or ACETIC ACID SOLUTION, more than 80% acid, by mass

Class or division : 8

Subsidiary hazard(s) : 3

Packing group : II

IATA Dangerous Goods Regulations

UN No.: 2789

Proper Shipping Name :

ACETIC ACID, GLACIAL or ACETIC ACID SOLUTION, more than 80% acid, by mass

Class or division : 8

Subsidiary hazard(s) : 3

Hazard labels : Corrosive & Flamm.liquid

Packing group : II

Environmental hazards

MARPOL Annex III – Prevention of pollution by harmful substances

Marine pollutants (yes/no) : no

Transport in bulk according to Annex II of MARPOL73/78 and IBC Code

Noxious Liquid ; Cat. Z

Acetic acid

15. Regulatory Information

Safety, health and environmental regulations/legislation specific for the substance or mixture

US major regulations

Chemicals listed in TSCA Inventory

Acetic acid; Perchloric acid

Other regulatory information

Ensure this material in compliance with federal requirements and ensure conformity to local regulations.

16. Other information

GHS classification and labelling

Flam. Liq. 3: H226 Flammable liquid and vapor

Acute Tox. 4: H312 Harmful in contact with skin

Skin Corr. 1: H314 Causes severe skin burns and eye damage

Eye Dam. 1: H318 Causes serious eye damage

Carc. 2: H351 Suspected of causing cancer

STOT SE 1: H370 Causes damage to organs after single exposure

STOT RE 2: H373 May cause damage to organs through prolonged or repeated exposure

Aquatic Acute 3: H402 Harmful to aquatic life

Reference Book

Globally Harmonized System of classification and labelling of chemicals, (6th ed., 2015), UN

Recommendations on the TRANSPORT OF DANGEROUS GOODS 20th edit., 2017 UN

IMDG Code, 2018 Edition (Incorporating Amendment 39-18)

IATA Dangerous Goods Regulations (60th Edition) 2019

Classification, labelling and packaging of substances and mixtures (table3-1 ECNO6182012)

2016 EMERGENCY RESPONSE GUIDEBOOK (US DOT)

2019 TLVs and BEIs. (ACGIH)

<http://monographs.iarc.fr/ENG/Classification/index.php>

Supplier's data/information

**General Disclaimer**

This data sheet was created based on the information we currently have and may be revised according to new information. In addition, the precautions apply only to normal handling, and in the case of special handling, please make adequate countermeasure to maintain your safety.

The data given here is based on current knowledge and experience. The purpose of this Safety Data Sheet is to describe the products in terms of their safety requirements. The data does not signify any warranty with regard to the products' properties.

The GHS classification data given here is based on current Japan official data (NITE published in 2018).