

Safety Data Sheet Formic Acid 10%

SDS no. EZP6RSMX • Version 1.0 • Date of issue: 2024-06-11

SECTION 1: Identification

GHS Product identifier

| | |
|----------------|---------------------|
| Product name | Formic Acid 10% |
| Product number | AFA10 |
| Brand | Australian Biostain |

Recommended use of the chemical and restrictions on use

Laboratory and Analytical Reagent

Supplier's details

| | |
|-----------|---|
| Name | ChemSupply Australia Pty Ltd |
| Address | 38-50 Bedford Street 5013 Gillman South Australia Australia |
| Telephone | 08 8440 2000 |
| email | www.chemsupply.com.au |

Emergency phone number

CHEMCALL 1800 127 406 (Australia) / +64-4-917-9888 (International)

SECTION 2: Hazard identification

General hazard statement

Classified as dangerous goods according to the Australian Dangerous Goods Code (ADG).

Classified as Hazardous according to the Globally Harmonised System of classification and labelling of Chemicals (GHS) including Work, Health and Safety regulations, Australia.

Classification of the substance or mixture

GHS classification in accordance with: UN GHS revision 7

- Serious eye damage/eye irritation, Cat. 1
- Flammable liquids, Cat. 4
- Corrosive to metals, Cat. 1
- Skin corrosion/irritation, Cat. 1A

GHS label elements, including precautionary statements

Pictograms



Signal word

Danger

Hazard statement(s)

H227
H290
H314

Combustible liquid
May be corrosive to metals
Causes severe skin burns and eye damage

Precautionary statement(s)

P210

P260
P280
P301+P330+P331
P303+P361+P353

P304+P340
P305+P351+P338

P363
P370+P378
P390
P403
P406
P501

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
Do not breathe dust/fume/gas/mist/vapors/spray.
Wear protective gloves/protective clothing/eye protection/face protection.
IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Wash contaminated clothing before reuse.
In case of fire: Use agents recommended in Section 5 of SDS for extinction
Absorb spillage to prevent material-damage.
Store in a well-ventilated place.
Store in a corrosive resistant/... container with a resistant inner liner.
Dispose of contents/container to an approved waste disposal facility

SECTION 3: Composition/information on ingredients

Mixtures

Molecular weight: 46.03

Components

| Component | CAS no. | Concentration |
|---|------------------|---------------------------|
| Formic acid (EC no.: 200-579-1; Index no.: 607-001-00-0) | 64-18-6 | 8 - 10 % (weight) |
| CLASSIFICATIONS: Flammable liquids, Cat. 3; Acute toxicity, oral, Cat. 4; Acute toxicity, inhalation, Cat. 3; Serious eye damage/eye irritation, Cat. 1; Hazardous to the aquatic environment, short-term (acute), Cat. 3; Skin corrosion/irritation, Cat. 1A. HAZARDS: H314 - Causes severe skin burns and eye damage. [SCLs/M-factors/ATEs]: Skin Corr. 1A; H314: C ≥ 90 %; Skin Corr. 1B; H314: 10 % ≤ C < 90 %; Skin Irrit. 2; H315: 2 % ≤ C < 10 %; Eye Irrit. 2; H319: 2 % ≤ C < 10 % | | |
| Water/Aqua/Eau | 7732-18-5 | 90 - 92 % (weight) |
| CLASSIFICATIONS: No data available. HAZARDS: No data available. | | |

SECTION 4: First-aid measures

Description of necessary first-aid measures

General advice

For advice, contact a Poisons Information Centre (e.g. phone Australia 13 11 26; New Zealand 0800 764 766) or a doctor (at once).

First Aid Facilities: Maintain eyewash fountain in work area.

If inhaled

If inhaled, remove affected person from contaminated area. Keep at rest until recovered. If symptoms develop and/or persist seek medical attention.

| | |
|-------------------------|--|
| In case of skin contact | Take off contaminated clothing and shoes immediately. Wash off with soap and plenty of water. Consult a physician |
| In case of eye contact | If in eyes, hold eyelids apart and flush eye continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre (e.g. phone Australia 13 11 26; New Zealand 0800 764 766) or a doctor, or for at least 15 minutes. |
| If swallowed | Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician. |

Most important symptoms/effects, acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

Indication of immediate medical attention and special treatment needed, if necessary

For advice in an emergency, contact a Poisons Information Centre (Phone Australia 131 126) or a doctor at once.

SECTION 5: Fire-fighting measures

Suitable extinguishing media

Small fire: Use dry chemical, CO₂ or water spray. If safe to do so, move undamaged containers from fire area.

Large fire: Use dry chemical, CO₂, foam or water spray - Do not use water jets.

Cool containers with flooding quantities of water until well after the fire is out. Avoid getting water inside containers.

Specific hazards arising from the chemical

Hazards from Combustion Products: Acrid smoke and toxic and/or irritating fumes, gases and vapours, including carbon monoxide (CO), formaldehyde and carbon dioxide (CO₂). Reacts with some metals to form flammable hydrogen gas.

May burn but do not ignite readily. Containers may explode when heated. When heated, vapours may form explosive mixtures with air. Contact with metals may evolve flammable hydrogen gas. Runoff may pollute waterways. May be transported in a molten form. Fire will produce irritating, poisonous and/or corrosive gases.

Special protective actions for fire-fighters

Wear SCBA and chemical splash suit. Fully-encapsulating, gas-tight suits should be worn for maximum protection. Structural firefighter's uniform is NOT effective for these materials.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

Wear respiratory equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas. For personal protection see section 8.

Methods and materials for containment and cleaning up

ELIMINATE all ignition sources (no smoking, flares, sparks or flames) within at least 15m. Do not touch or walk through spilled material. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Stop leak if safe to do so - Prevent entry into waterways, drains or confined areas. Cover with plastic sheet to prevent spreading. Absorb with earth, sand or other non-combustible material and transfer to container. DO NOT GET WATER INSIDE CONTAINERS. SEEK EXPERT ADVICE ON HANDLING AND DISPOSAL.

SECTION 7: Handling and storage

Precautions for safe handling

Avoid ingestion or inhalation of vapour/gas/fumes/spray mist. Avoid contact with eyes, skin, or clothing. Avoid prolonged or repeated exposure. Build up of mists or vapours in the atmosphere must be prevented. Keep locked up. Keep container closed. DO NOT store or use

in confined spaces. Use only with adequate ventilation. In case of insufficient ventilation, wear suitable respiratory equipment. Maintain high standards of personal hygiene ie. wash hands prior to eating, drinking, smoking or using toilet facilities. Keep away from incompatibles such as oxidizing agents, organic materials, acids, alkalis. Keep away from heat and all sources of ignition. Ground all equipment containing material. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Do not use near welding or other ignition sources and avoid sparks. Do not smoke. Containers of this material may be dangerous/hazardous when empty since they retain product residues (vapours, liquid); observe all warnings and precautions listed for the product. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.

Conditions for safe storage, including any incompatibilities

Store in a segregated and approved corrosives area. Store in tightly closed containers, in a cool, dry, well-ventilated area, away from incompatible materials, food and feedstuffs. Keep containers closed when not in use and securely sealed and protected against physical damage, direct sunlight and water/moisture. Store away from heat and all sources of ignition.

Corrosive to most metals. Corrosive to steel, cast iron and lead, and aluminium at 38-93 °C. Plastic materials such as polyamides dissolve in the acid.

SECTION 8: Exposure controls/personal protection

Appropriate engineering controls

Use ventilation adequate to keep exposures (airborne levels of dust, fume, vapor, gas, etc.) below recommended exposure limits.

Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection

The use of a face shield, chemical goggles or safety glasses with side shield protection as appropriate. Must comply with Australian Standards AS 1337 and be selected and used in accordance with AS 1336.

Skin protection

Clean impervious clothing should be worn. Clothing for protection against chemicals should comply with AS 3765 Clothing for Protection Against Hazardous Chemicals.

Hand Protection: Ensure hand protection complies with AS 2161, Occupational protective gloves - Selection, use and maintenance.

Body protection

Suitable protective workwear, e.g. cotton overalls buttoned at neck and wrist is recommended. Chemical resistant apron is recommended where large quantities are handled.

Footwear: Safety boots in industrial situations is advisory, foot protection should comply with AS 2210, Occupational protective footwear - Guide to selection, care and use.

Body Protection: Clean clothing or protective clothing should be worn, preferably with and apron. Clothing for protection against chemicals should comply with AS 3765 Clothing for Protection Against Hazardous Chemicals.

Respiratory protection

If engineering controls are not effective in controlling airborne exposure then an approved respirator with a replaceable vapor/ mist filter should be used. Refer to relevant regulations for further information concerning respiratory protective requirements. Reference should be made to Australian Standards AS/ NZS 1715, Selection, Use and Maintenance of Respiratory Protective Devices; and AS/NZS 1716, Respiratory Protective Devices, in order to make any necessary changes for individual circumstances.

SECTION 9: Physical and chemical properties

Basic physical and chemical properties

Safety Data Sheet

Formic Acid 10%

SDS no. EZP6RSMX • Version 1.0 • Date of issue: 2024-06-11

Physical state
Appearance
Color
Odor
Odor threshold

Liquid
Clear, colourless, fuming liquid. Hygroscopic.
No data available.
Characteristic, benzaldehyde-like, pungent, penetrating odour.
Reported values vary widely and are not reliable; 13-340 ppm (detection); 11-13 ppm (recognition); 20 ppm (100% recognition) (100% formic acid).

Melting point/freezing point
Boiling point or initial boiling point and boiling range
Flammability
Lower and upper explosion limit/flammability limit
Flash point
Explosive properties

No data available.
No data available.
Combustible
No data available.
>65C

Auto-ignition temperature
Decomposition temperature

Above flash point, vapour-air mixtures are explosive within flammable limits noted above. Vapours from heated liquid can accumulate in confined spaces, resulting in an explosion and toxicity hazard. Reacts explosively with oxidizing agents. Reaction with furfuryl alcohol was explosive. Reaction with sodium hypochlorite solution becomes explosive at 55 °C.
No data available.

Oxidizing properties
pH
Kinematic viscosity
Solubility

Slow decomposition to carbon monoxide and water occurs at room temperature up to 150 °C. Direct sunlight and heating up as well as contact with metallic oxides and metal ions accelerates the decomposition. At higher temperatures carbon monoxide, carbon di

Strong reducing agent.
2.2 (10 g/l, H₂O, 20 °C) (100%).

No data available.
Solubility in Water: Miscible in all proportions. Solubility in Organic Solvents: Miscible with most polar organic solvents. Soluble in all proportions in diethyl ether, acetone, ethyl acetate, methanol, ethanol and glycerol. Partially soluble in benzene, toluene, and xylenes. Somewhat soluble in hydrocarbons.

Partition coefficient n-octanol/water (log value)
Vapor pressure
Evaporation rate
Density and/or relative density
Relative vapor density
Particle characteristics

No data available.
No data available.
No data available.
Approx 1
No data available.
No data available.

Supplemental information regarding physical hazard classes

No data available.

Further safety characteristics (supplemental)

Saturated Vapour Concentration: 80 g/m³ at 20 °C (100% solution).

Other Information: Critical Temperature: 314.9 °C (100% solution).

Taste: Sour.

Acidity: Moderately strong acid; pKa = 3.75 at 20 °C (100% solution).

Conversion Factor: 1 ppm = 1.88 mg/m³; 1 mg/m³ = 0.532 ppm at 25 °C (calculated) (100% solution)

Index of refraction: 1.3714 at 20 °C/D (100% solution)

Bulk density: 10.16 lb/gal at 20 °C (100% solution).

SECTION 10: Stability and reactivity

Reactivity

Stable under normal conditions of storage and handling.

Chemical stability

Moderately stable, heat-sensitive, light-sensitive, hygroscopic. Can decompose slowly during storage, particularly at higher concentrations and temperatures, to produce toxic, flammable substances, including carbon monoxide gas and water or carbon dioxide and hydrogen gas.

Possibility of hazardous reactions

Formic acid is a strong reducing agent and a medium strong acid. Reacts vigorously with catalysts (e.g. palladium-carbon, nickel) or finely powdered metals producing flammable hydrogen gas. Reaction with oxidizing agents (e.g. chromic acid, nitric acid, peroxides, permanganates) may be violently explosive. May react violently with strong bases (e.g. sodium hydroxide). Reacts violently with concentrated sulfuric acid or phosphorus pentoxide producing heat and carbon monoxide gas. Mixture with nitromethane may react explosively if shocked. May react violently and explosively with furfuryl alcohol or sodium hypochlorite.

Aluminium may reduce the acid with incandescence. Reaction with thallium nitrate trihydrate and a small amount of vanillin may be violent. Attempted dehydration of 95% acid to anhydrous formic acid caused rapid evolution of carbon monoxide. Reactive with organic materials, metals and acids.

Conditions to avoid

Heat, temperatures above 46.5 °C, moisture, direct sunlight, sources of ignition, shocks and mechanical impacts and incompatible materials.

Incompatible materials

Many metals, catalysts (e.g. palladium-carbon, nickel) or finely powdered metals, copper, stainless steel(304), steel, cast iron and lead, and aluminium at 38-93 °C, oxidizing agents (e.g. chromic acid, nitric acid, peroxides, permanganates), strong bases (e.g. sodium hydroxide, ammonia, ammonium hydroxide, calcium hydroxide, potassium hydroxide), concentrated sulfuric acid, nonmetallic oxides (phosphorus pentoxide), nitro compounds (organic, eg. nitromethane, nitrobenzene, nitroglycerine, picric acid, trinitrotoluene), furfuryl alcohol, sodium hypochlorite, thallium nitrate trihydrate + a small amount of vanillin, certain plastic materials, such as polyamides, exposure to moisture air or water.

Hazardous decomposition products

Acrid smoke and toxic and/or irritating fumes, gases and vapours, including carbon monoxide (CO), formaldehyde and carbon dioxide (CO₂). Reacts with some metals to form flammable hydrogen gas.

SECTION 11: Toxicological information

Information on toxicological effects

Acute toxicity

Acute Toxicity - Oral: LD50 (rat): 1100 mg/kg (calculated on the pure substance)

Acute Toxicity - Inhalation: LC50 (rat): 2000 ppm/ 4 hr; 7.4mg/l

Ingestion: Harmful if swallowed. Causes severe chemical burns to the mouth, throat, stomach and digestive tract with immediate pain and difficulty swallowing, burning sensation, sore throat, abdominal pain, abdominal cramps, nausea, vomiting and diarrhoea, leading to shortness of breath and chest pain as well as more serious effects, including shock, and death if the dose is large or the solution is highly concentrated. Severe poisonings or repeated small doses may cause damage to kidneys, liver, blood, or central nervous system. Ingestion is not a typical route of occupational exposure.

Inhalation: Harmful by inhalation. Formic acid easily forms high vapour concentrations posing a significant inhalation hazard, especially in poorly ventilated areas. The odour warning when the exposure limit value is exceeded is insufficient. Liquid or spray mist may produce severe irritation to the mucous membranes of the nose, throat, and respiratory tract, or chemical burns or tissue damage particularly on mucous membranes of respiratory tract. Inhalation of higher concentrations may cause central nervous system effects, lung damage and reversible kidney effects. Symptoms of exposure may include tearing of the eyes, runny nose, lesions of the nasal septum, burning sensation, sore throat, coughing, choking, wheezing, laryngitis, dyspnoea, laboured breathing, headache, nausea, vomiting, spasm, inflammation and oedema of the larynx and bronchi, chemical pneumonitis, pulmonary oedema, emphysema and unconsciousness.

Safety Data Sheet

Formic Acid 10%

SDS no. EZP6RSMX • Version 1.0 • Date of issue: 2024-06-11

Symptoms may be delayed for several hours after exposure and are aggravated by physical exertion. Rest and medical observation are therefore essential.

The ATE (gas inhalation) of the mixture is: 7000 ppmV

The ATE (vapor inhalation) of the mixture is: 30 mg/l

The ATE (oral) of the mixture is: 5000 mg/kg bw

Skin corrosion/irritation

Corrosive, causes severe skin burns. Skin contact may cause stinging pain, redness, itching, swelling, scaling, blistering, irritation, severe pain and deep chemical burns with resultant tissue destruction. Skin damage may require weeks to heal. May cause permanent scarring. Harmful by skin absorption. Readily absorbed through skin.

Serious eye damage/irritation

Corrosive! Risk of blindness! Lachrymator (substance which increases the flow of tears). The vapour can cause eye irritation, which may be severe depending upon the airborne concentration, with redness, watering, and itching. Contact with liquid or spray mist of pure acid or dilute solutions may cause severe deep eye burns and possible permanent damage to the eye, lens or cornea, including corneal oedema, ulceration, scarring and blindness, depending on the concentration of the solution and the degree of exposure, with stinging, blurred vision, tearing and severe pain.

Respiratory or skin sensitization

No data available.

Germ cell mutagenicity

No data available.

Carcinogenicity

No data available.

Reproductive toxicity

No data available.

Summary of evaluation of the CMR properties

No data available.

Specific target organ toxicity (STOT) - single exposure

No data available.

Specific target organ toxicity (STOT) - repeated exposure

No data available.

Aspiration hazard

No data available.

Additional information

Chronic Effects: Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection. Repeated or prolonged contact with spray or mist may produce chronic eye irritation and severe skin irritation.

Prolonged or repeated exposure to low concentrations may cause skin irritation and burns, with the possibility of sensitization dermatitis, particularly in workers previously sensitized to formaldehyde. Repeated or prolonged exposure to the substance can damage the kidneys (indicated by albuminuria and hematuria), liver, respiratory tract, lungs, skin, eyes, lens or cornea, or central nervous system (CNS).

SECTION 12: Ecological information

Toxicity

Ecotoxicity: Harmful effect on aquatic organisms. Forms corrosive mixtures with water even if diluted. Damage of fish and plankton. Harmful effect due to pH shift. Neutralization possible in waste water treatment plants.

Acute Toxicity - Fish: *L. idus* LC50: 46-100 mg/l /96 h (calculated on the pure substance).

Acute Toxicity - Daphnia: *Daphnia magna* EC50: 34.2 mg/l /48 h (calculated on the pure substance).

Acute Toxicity - Algae: *Desmodesmus subspicatus* IC50: 27 mg/l /72 h (calculated on the pure substance).

Acute Toxicity - Bacteria: *Ps. putida* EC50: 47 mg/l /17 h (calculated on the pure substance).

Persistence and degradability

Biodegradation: 98 % /14 d (calculated on the pure substance);

Readily biodegradable.

Bioaccumulative potential

No bioaccumulation is to be expected (log P(o/w) <1).

Mobility in soil

Distribution: log p(o/w): -0.54 (experimental).

SECTION 13: Disposal considerations

Disposal methods

Product disposal

Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers.

Sewage disposal

No bioaccumulation is to be expected (log P(o/w) <1).

Other disposal recommendations

Do not discharge this material into waterways, drains and sewers.

SECTION 14: Transport information

ADG (Road and Rail)

UN Number: 3412

Class: 8

Packing Group: III

Proper Shipping Name: FORMIC ACID with not less than 5% but less than 10% acid by mass

Hazchem emergency action code (EAC)

2X

IMDG

UN Number: 3412

Class: 8

Packing Group: III

Proper Shipping Name: FORMIC ACID with not less than 5% but less than 10% acid by mass

IATA

UN Number: 3412

Class: 8

Packing Group: III

Proper Shipping Name: FORMIC ACID with not less than 5% but less than 10% acid by mass

SECTION 15: Regulatory information

Safety, health and environmental regulations specific for the product in question

Australia SUSMP

Poison Schedule: S5

SECTION 16: Other information

Further information/disclaimer

ChemSupply Australia Pty Ltd does not warrant that this product is suitable for any use or purpose. The user must ascertain the suitability of the product before use or application intended purpose. Preliminary testing of the product before use or application is recommended. Any reliance or purported reliance upon ChemSupply Australia Pty Ltd with respect to any skill or judgement or advice in relation to the suitability of this product of any purpose is disclaimed. Except to the extent prohibited at law, any condition implied by any statute as to the merchantable quality of this product or fitness for any purpose is hereby excluded. This product is not sold by description. Where the provisions of Part V, Division 2 of the Trade Practices Act apply, the liability of ChemSupply Australia Pty Ltd is limited to the replacement of supply of equivalent goods or payment of the cost of replacing the goods or acquiring equivalent goods.

Preparation information

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Standard for the Uniform Scheduling of Medicines and Poisons, Commonwealth of Australia

National Road Transport Commission, 'Australian Code for the Transport of Dangerous Goods by Road and Rail 7th. Ed.'

Safe Work Australia, 'National Code of Practice for the Preparation of Safety Data Sheets for Hazardous Chemicals', July 2020.

Safe Work Australia, 'National Guide for Classifying Hazardous Chemicals', July 2020.

Safe Work Australia, Workplace Exposure Standards for Airborne Contaminants, December 2019

Safe Work Australia, Hazardous Chemical Information System (HCIS), hcis.safeworkaustralia.gov.au

IATA, Dangerous Goods Regulations (DGR)

IMO, International Maritime Dangerous Goods Code (IMDG)