

Chemical Safety Data Sheet MSDS / SDS

Lysozyme hydrochloride

Revision Date:2025-02-01 Revision Number:1

SECTION 1: Identification of the substance/mixture and of the company/undertaking

Product identifier

Product name : Lysozyme hydrochloride
CBnumber : CB1109069
CAS : 9066-59-5
EINECS Number : 2329540
Synonyms : Lysozyme Hydrochloride, Lysozyme Chloride

Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses : For R&D use only. Not for medicinal, household or other use.
Uses advised against : none

Company Identification

Company : Chemicalbook
Address : Building 1, Huihuang International, Shangdi 10th Street, Haidian District, Beijing
Telephone : 400-158-6606

SECTION 2: Hazards identification

Classification of the substance or mixture

Respiratory sensitization, Category 1

Label elements

Pictogram(s)

□

Signal word Danger

Hazard statement(s)

H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled

Precautionary statement(s)

Prevention

P261 Avoid breathing dust/fume/gas/mist/vapours/spray.

P284 [In case of inadequate ventilation] wear respiratory protection.

Response

P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P342+P316 If experiencing respiratory symptoms: Get emergency medical help immediately.

Storage

none

Disposal

P501 Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

Other hazards

no data available

SECTION 3: Composition/information on ingredients

Substance

Product name	: Lysozyme hydrochloride
Synonyms	: Lysozyme Hydrochloride, Lysozyme Chloride
CAS	: 9066-59-5
EC number	: 2329540
MF	: HCl

SECTION 4: First aid measures

Description of first aid measures

If inhaled

Fresh air, rest. Half-upright position. Artificial respiration may be needed. Refer immediately for medical attention.

Following skin contact

Wear protective gloves when administering first aid. First rinse with plenty of water for at least 15 minutes, then remove contaminated clothes and rinse again. Refer immediately for medical attention.

Following eye contact

Rinse with plenty of water for several minutes (remove contact lenses if easily possible). Refer immediately for medical attention.

Following ingestion

Rinse mouth with water. Do not induce vomiting. Never give anything by mouth to an unconscious person. Call a doctor or Poison Control Center immediately.

Most important symptoms and effects, both acute and delayed

Inhalation of fumes results in coughing and choking sensation, and irritation of nose and lungs. Liquid causes burns. (USCG, 1999)

Gas concentrations of 50 to 100 ppm are tolerable for 1 hour. Concentrations of 1,000 to 2,000 ppm are dangerous, even for brief exposures.

More severe exposures will result in serious respiratory distress and prolonged exposures will result in death. Mists of hydrochloric acid are considered less harmful than anhydrous hydrochloric acid, because droplets have no dehydrating action. Individuals with respiratory problems and digestive diseases may be adversely affected by low level exposures to the gas or mist. (EPA, 1998)

Excerpt from ERG Guide 125 [Gases - Corrosive]: TOXIC; may be fatal if inhaled, ingested or absorbed through skin. Vapors are extremely irritating and corrosive. Contact with gas or liquefied gas may cause burns, severe injury and/or frostbite. Fire will produce irritating, corrosive and/or toxic gases. Runoff from fire control may cause pollution. (ERG, 2016)

SYMPTOMS: Symptoms of exposure to this compound include mild irritation of the skin and eyes, diarrhea and gastrointestinal irritation. It may

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also cause nausea, pulmonary edema and coma. Gastrointestinal disturbances may occur. ACUTE/CHRONIC HAZARDS: This compound is a mild irritant of the skin and eyes. When heated to decomposition it emits toxic fumes of nitrogen oxides, sulfur oxides and ammonia. (NTP, 1992)

Indication of any immediate medical attention and special treatment needed

PREHOSPITAL/ Consult with the base station physician or the regional poison control center for advice regarding triage of multiple victims. Patients with evidence of significant exposure such as skin or eye irritation, pain, or breathing difficulties should be transported to a medical facility for evaluation. Others may be discharged from the scene after their names, addresses, and telephone numbers are recorded. Those discharged should be advised to seek medical care promptly if symptoms develop

SECTION 5: Firefighting measures

Extinguishing media

Suitable extinguishing media: Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Specific Hazards Arising from the Chemical

Special Hazards of Combustion Products: Toxic and irritating vapors are generated when heated. (USCG, 1999)

Fire may produce irritating or poisonous gases. Containers may explode in heat of fire. At high temperatures, it decomposes into hydrogen and chlorine. The following materials should be avoided: Mercuric sulfate -- violent reaction with gaseous hydrochloric acid at 250F. Sodium -- reacts vigorously with gaseous hydrochloric acid. Acetic anhydride, 2-aminoethanol, ammonium hydroxide, chlorosulfonic acid, ethylene diamine, ethyleneimine, oleum, propiolactone, sodium hydroxide, sulfuric acid, and vinyl acetate -- increase in temperature and pressure when mixed with hydrochloric acid. Calcium phosphide -- energetic reaction with hydrochloric acid. Silver perchlorate and carbon tetrachloride -- when mixed in combination with hydrochloric acid forms a compound that detonates at 105F. Formaldehyde -- when mixed with hydrochloric acid forms a human carcinogen. Material reacts violently with bases and is corrosive with the generation of heat. Reacts with base metals, forming combustible gas (hydrogen). Reacts violently with strong oxidants forming toxic gas (chlorine). Avoid heat; at high temperatures it will decompose into hydrogen and chlorine. (EPA, 1998)

Excerpt from ERG Guide 125 [Gases - Corrosive]: Some may burn but none ignite readily. Vapors from liquefied gas are initially heavier than air and spread along ground. Some of these materials may react violently with water. Cylinders exposed to fire may vent and release toxic and/or corrosive gas through pressure relief devices. Containers may explode when heated. Ruptured cylinders may rocket. For UN1005: Anhydrous ammonia, at high concentrations in confined spaces, presents a flammability risk if a source of ignition is introduced. (ERG, 2016) This chemical is probably combustible. (NTP, 1992)

Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

Avoid dust formation. Avoid breathing mist, gas or vapours. Avoid contacting with skin and eye. Use personal protective equipment. Wear chemical impermeable gloves. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak.

Environmental precautions

Evacuate danger area! Consult an expert! Personal protection: gas-tight chemical protection suit including self-contained breathing apparatus. Ventilation. Remove gas with fine water spray.

Methods and materials for containment and cleaning up

Accidental release measures. Personal precautions, protective equipment and emergency procedures: Wear respiratory protection. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas.; Environmental precautions: Prevent further leakage or spillage if safe to do so. Do not let product enter drains.; Methods and materials for containment and cleaning up: Clean up promptly by sweeping or vacuum.

SECTION 7: Handling and storage

Precautions for safe handling

Handling in a well ventilated place. Wear suitable protective clothing. Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Use non-sparking tools. Prevent fire caused by electrostatic discharge steam.

Conditions for safe storage, including any incompatibilities

Cool. Fireproof if in building. Separated from food and feedstuffs and incompatible materials. See Chemical Dangers. Keep in a well-ventilated room. Keep container tightly closed in a dry and well-ventilated place. Storage class (TRGS 510): Gases

SECTION 8: Exposure controls/personal protection

Control parameters

Occupational Exposure limit values

Component	Lysozyme, hydrochloride
CAS No.	9066-59-5
	Recommended Exposure Limit: Ceiling value: 5 ppm (7 mg/cu m).

Biological limit values

no data available

Exposure controls

Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Set up emergency exits and the risk-elimination area.

Individual protection measures

Eye/face protection

Wear tightly fitting safety goggles with side-shields conforming to EN 166(EU) or NIOSH (US).

Skin protection

Wear fire/flammable resistant and impervious clothing. Handle with gloves. Gloves must be inspected prior to use. Wash and dry hands. The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Respiratory protection

If the exposure limits are exceeded, irritation or other symptoms are experienced, use a full-face respirator.

Thermal hazards

no data available

SECTION 9: Physical and chemical properties

Information on basic physicochemical properties

Physical state	Hydrochloric acid, solution is a colorless watery liquid with a sharp, irritating odor. Consists of hydrogen chloride, a gas, dissolved in water. Sinks and mixes with water. Produces irritating vapor. (USCG, 1999)
Colour	Colorless gas
Odour	Pungent, irritating odor
Melting point/freezing point	227°C(lit.)
Boiling point or initial boiling point and boiling range	135°C/10mmHg(lit.)
Flammability	Nonflammable Gas
Lower and upper explosion limit/flammability limit	no data available
Flash point	99°C(lit.)
Auto-ignition temperature	Not flammable (USCG, 1999)
Decomposition temperature	no data available
pH	pH (15g/l, 25°C) : 3.0~5.0
Kinematic viscosity	0.405 cP (liquid at 118.16 K); 0.0131 cP (vapor at 273.06 K); 0.0253 cP (vapor at 523.2 K)
Solubility	82.3 g/100 g at 32° F (NTP, 1992)
Partition coefficient n-octanol/water	0.25
Vapour pressure	413.6 mm Hg (USCG, 1999)
Density and/or relative density	1.05 at 59° F for 10.17% weight/weight solution (EPA, 1998)
Relative vapour density	1.268 (EPA, 1998) (Relative to Air)
Particle characteristics	no data available

SECTION 10: Stability and reactivity

Reactivity

The solution in water is a strong acid. It reacts violently with bases and is corrosive. Reacts violently with oxidants. This produces toxic gas (chlorine - see ICSC 0126). Attacks many metals in the presence of water. This produces flammable/explosive gas (hydrogen - see ICSC 0001).

Chemical stability

Stable under recommended storage conditions.

Possibility of hazardous reactions

The gas is heavier than air and may accumulate in lowered spaces causing a deficiency of oxygen. HYDROCHLORIC ACID is an aqueous

solution of hydrogen chloride, an acidic gas. Reacts exothermically with organic bases (amines, amides) and inorganic bases (oxides and hydroxides of metals). Reacts exothermically with carbonates (including limestone and building materials containing limestone) and hydrogen carbonates to generate carbon dioxide. Reacts with sulfides, carbides, borides, and phosphides to generate toxic or flammable gases. Reacts with many metals (including aluminum, zinc, calcium, magnesium, iron, tin and all of the alkali metals) to generate flammable hydrogen gas. Reacts violently with acetic anhydride, 2-aminoethanol, ammonium hydroxide, calcium phosphide, chlorosulfonic acid, 1,1-difluoroethylene, ethylenediamine, ethyleneimine, oleum, perchloric acid, γ -propiolactone, propylene oxide, silver perchlorate/carbon tetrachloride mixture, sodium hydroxide, uranium(IV) phosphide, vinyl acetate, calcium carbide, rubidium carbide, cesium acetylide, rubidium acetylide, magnesium boride, mercury(II) sulfate [Lewis]. Mixtures with concentrated sulfuric acid can evolve toxic hydrogen chloride gas at a dangerous rate. Undergoes a very energetic reaction with calcium phosphide [Mellor 8:841(1946-1947)].

Conditions to avoid

no data available

Incompatible materials

The aqueous solution is a strong acid. Corrosive fumes emitted on contact with air. Reacts violently with bases, oxidizers forming toxic chlorine gas. Reacts, often violently, with acetic anhydride, active metals, aliphatic amines, alkanolamines, alkylene oxides, aromatic amines, amides, 2-aminoethanol, ammonia, ammonium hydroxide, calcium phosphide, chlorosulfonic acid, ethylene diamine, ethyleneimine, epichlorohydrin, isocyanates, metal acetylides, oleum, organic anhydrides, perchloric acid, γ -propiolactone, uranium phosphide, sulfuric acid, vinyl acetate, vinylidene fluoride. Highly corrosive to most metals, forming flammable hydrogen gas. Attacks some plastics, rubber, and coatings.

Hazardous decomposition products

When heated to decomp it emits toxic fumes of Cl⁻ /Hydrochloric acid/.

SECTION 11: Toxicological information

Acute toxicity

- Oral: LD50 Rabbit oral 900 mg/kg
- Inhalation: LC50 Rat inhalation 3124 ppm/1 hr
- Dermal: no data available

Skin corrosion/irritation

no data available

Serious eye damage/irritation

no data available

Respiratory or skin sensitization

no data available

Germ cell mutagenicity

no data available

Carcinogenicity

Evaluation: There is inadequate evidence for the carcinogenicity in humans of hydrochloric acid. There is inadequate evidence for the

carcinogenicity in experimental animals of hydrochloric acid. Overall evaluation: Hydrochloric acid is not classifiable as to its carcinogenicity to humans (Group 3).

Reproductive toxicity

No information is available on the reproductive or developmental effects of hydrochloric acid in humans. In rats exposed to hydrochloric acid by inhalation, severe dyspnea, cyanosis, and altered estrus cycles have been reported in dams, and increased fetal mortality and decreased fetal weight have been reported in the offspring.

STOT-single exposure

no data available

STOT-repeated exposure

no data available

Aspiration hazard

no data available

SECTION 12: Ecological information

Toxicity

Toxicity to fish: LC50; Species: *Lepomis macrochirus* (Blue gill); Conditions: artificial water, flow-through, 20 +/- 1 deg C, dissolved oxygen 5-9 mg/L; Concentration: 24.6 mg/L for 96 hr for small and medium size fish; 30.9 mg/L for 96 hr for large size fish.

Toxicity to daphnia and other aquatic invertebrates: no data available

Toxicity to algae: no data available

Toxicity to microorganisms: no data available

Persistence and degradability

no data available

Bioaccumulative potential

Hydrogen chloride dissociates readily in water to chloride and hydronium ions(1). Therefore, hydrogen chloride does not accumulate in the aquatic organisms(1,2).

Mobility in soil

Hydrogen chloride dissociates into chloride and hydronium ions in moist soil(1).

Other adverse effects

no data available

SECTION 13: Disposal considerations

Disposal methods

Product

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

Contaminated packaging

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

SECTION 14: Transport information

UN Number

ADR/RID: Not dangerous goods. (For reference only, please check.)

IMDG: Not dangerous goods. (For reference only, please check.)

IATA: Not dangerous goods. (For reference only, please check.)

UN Proper Shipping Name

ADR/RID: Not dangerous goods. (For reference only, please check.)

IMDG: Not dangerous goods. (For reference only, please check.)

IATA: Not dangerous goods. (For reference only, please check.)

Transport hazard class(es)

ADR/RID: Not dangerous goods. (For reference only, please check.)

IMDG: Not dangerous goods. (For reference only, please check.)

IATA: Not dangerous goods. (For reference only, please check.)

Packing group, if applicable

ADR/RID: Not dangerous goods. (For reference only, please check.)

IMDG: Not dangerous goods. (For reference only, please check.)

IATA: Not dangerous goods. (For reference only, please check.)

Environmental hazards

ADR/RID: No

IMDG: No

IATA: No

Special precautions for user

no data available

Transport in bulk according to IMO instruments

no data available

SECTION 15: Regulatory information

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

European Inventory of Existing Commercial Chemical Substances (EINECS)

Listed.

EC Inventory

Listed.

United States Toxic Substances Control Act (TSCA) Inventory

Not Listed.

China Catalog of Hazardous chemicals 2015

Not Listed.

New Zealand Inventory of Chemicals (NZIoC)

Not Listed.

PICCS

Not Listed.

Vietnam National Chemical Inventory

Not Listed.

IECSC

Not Listed.

Korea Existing Chemicals List (KECL)

Not Listed.

SECTION 16: Other information

Abbreviations and acronyms

CAS: Chemical Abstracts Service

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road

RID: Regulation concerning the International Carriage of Dangerous Goods by Rail

IMDG: International Maritime Dangerous Goods

IATA: International Air Transportation Association

TWA: Time Weighted Average

STEL: Short term exposure limit

LC50: Lethal Concentration 50%

LD50: Lethal Dose 50%

EC50: Effective Concentration 50%

References

IPCS - The International Chemical Safety Cards (ICSC), website: <http://www.ilo.org/dyn/icsc/showcard.home>

HSDB - Hazardous Substances Data Bank, website: <https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm>

IARC - International Agency for Research on Cancer, website: <http://www.iarc.fr/>

eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website: http://www.echemportal.org/echemportal/index?pagelD=0&request_locale=en

CAMEO Chemicals, website: <http://cameochemicals.noaa.gov/search/simple>

ChemIDplus, website: <http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp>

ERG - Emergency Response Guidebook by U.S. Department of Transportation, website: <http://www.phmsa.dot.gov/hazmat/library/erg>

Germany GESTIS-database on hazard substance, website: <http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp>

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