Chemical Safety Data Sheet MSDS / SDS

Methenamine SDS

Revision Date:2024-04-25 Revision Number:1

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

Product identifier

Product name: Methenamine

CAS: 100-97-0

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.in

Address: 5 vasavi Layout Basaveswara Nilayam Pragathi Nagar Hyderabad, India -500090

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SECTION 2: Hazards identification

Classification of the substance or mixture

Flammable solids, Category 2
Skin sensitization, Category 1

GHS label elements, including precautionary statements

Pictogram(s)

Signal word Warning

Hazard statement(s)

H228 Flammable solid
H317 May cause an allergic skin reaction

Precautionary statement(s)

Prevention

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P240 Ground and bond container and receiving equipment.
P241 Use explosion-proof [electrical/ventilating/lighting/...] equipment.
P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P272 Contaminated work clothing should not be allowed out of the workplace.

Response

P370+P378 In case of fire: Use ... to extinguish.
P302+P352 IF ON SKIN: Wash with plenty of water/...
P333+P317 If skin irritation or rash occurs: Get medical help.
P321 Specific treatment (see ... on this label).
P362+P364 Take off contaminated clothing and wash it before reuse.

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 which do not result in classification

no data available

SECTION 3: Composition/information on ingredients

Substance

Chemical name:	Methenamine
Common names and synonyms:	Methenamine
CAS number:	100-97-0
EC number:	202-905-8
Concentration:	100%

SECTION 4: First aid measures

Description of necessary first-aid measures

If inhaled

Fresh air, rest. Refer for medical attention.

Following skin contact

Remove contaminated clothes. Rinse and then wash skin with water and soap. Refer for medical attention .

Following eye contact

First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.

Following ingestion

Rinse mouth. Give a slurry of activated charcoal in water to drink. Refer for medical attention .

Most important symptoms/effects, acute and delayed

SYMPTOMS: Symptoms of exposure to this compound may include irritation of the skin, eyes, mucous membranes and upper respiratory tract. Exposure may cause skin rash and kidney irritation. Inhalation may cause coughing and shortness of breath. It may cause corrosion of the respiratory tract. Skin contact may cause redness, pain, rashes and burns of the skin. Eye contact may cause redness, pain and blurred vision. Ingestion of this compound may cause urinary tract irritation, digestive disturbances, and severe nephritis which may be fatal. If large amounts are ingested it can cause sore throat, abdominal pain, vomiting, diarrhea, painful

and frequent urination, and blood in the urine. Large oral doses can also cause gastrointestinal irritation, albuminuria, hemorrhagic cystitis, mild azotemia, gross hematuria and dysuria, with inflammatory lesions in the renal tubules, renal pelvis, and urinary bladder. It can also cause irritation of the bladder, and nausea. Repeated use can lead to skin sensitization with urticaria or dermatitis. Prolonged contact can cause smarting and reddening of the skin. It can produce an asthma-like condition. Kidney damage has been reported. ACUTE/CHRONIC HAZARDS: This compound may be harmful by inhalation, ingestion or skin absorption. It is an irritant of the skin, eyes, mucous membranes and upper respiratory tract. When heated to decomposition it emits toxic fumes of carbon monoxide, carbon dioxide, nitrogen oxides, ammonia, and formaldehyde. (NTP, 1992)

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

Immediate first aid: Ensure that adequate decontamination has been carried out. If patient is not breathing, start artificial respiration, preferably with a demand valve resuscitator, bag-valve-mask device, or pocket mask, as trained. Perform CPR if necessary. Immediately flush contaminated eyes with gently flowing water. Do not induce vomiting. If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain an open airway and prevent aspiration. Keep patient quiet and maintain normal body temperature. Obtain medical attention. Aldehydes and Related Compounds

SECTION 5: Firefighting measures

Suitable 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: Formaldehyde gas and ammonia may be given off when hot. (USCG, 1999)

Special protective actions for fire-fighters

Use water spray, foam, powder.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

Personal protection: filter respirator for organic gases and particulates adapted to the airborne concentration of the substance. Sweep spilled substance into covered containers. If appropriate, moisten first to prevent dusting. Wash away remainder with plenty of water.

Environmental precautions

Personal protection: filter respirator for organic gases and particulates adapted to the airborne concentration of the substance. Sweep spilled substance into covered containers. If appropriate, moisten first to prevent dusting. Wash away remainder with plenty of water.

Methods and materials for containment and cleaning up

Accidental Release Measures: Personal precautions, protective equipment and emergency procedures: Use personal protective equipment. Avoid dust formation. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Avoid breathing dust; 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: Sweep up and shovel. Contain spillage, and then collect with an electrically protected vacuum cleaner or by wetbrushing and place in container for disposal according to local regulations. Keep in suitable, closed containers for disposal.

SECTION 7: Handling and storage

Precautions for safe handling

NO open flames. Closed system, dust explosion-proof electrical equipment and lighting. Prevent deposition of dust. 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

Separated from strong acids and strong oxidants. Dry.Keep container tightly closed in a dry and well-ventilated place. Hygroscopic. Storage class (TRGS 510): Flammable solid hazardous materials

SECTION 8: Exposure controls/personal protection

Control parameters

Occupational Exposure limit values

MAK sensitization of skin (SH)

Biological limit values

no data available

Appropriate engineering 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, such as personal protective equipment (PPE)

Eye/face protection

Wear face shield or eye protection in combination with breathing protection.

Skin protection

Protective gloves. Protective clothing.

Respiratory protection

Use local exhaust or breathing protection.

Thermal hazards

no data available

SECTION 9: Physical and chemical properties and safety characteristics

Physical state:	PHYSICAL DESCRIPTION: Odorless white crystalline powder or colorless lustrous crystals. Sublimes in a vacuum at about 505° F with some decomposition. Solutions are strong bases (pH of 0.2 molar aqueous solution is 8.4). (NTP, 1992)
Colour:	Crystallizes from ethanol as colorless, hygroscopic rhombododecahedra.
Odour:	Odorless
Melting point/freezing point:	280°C
Boiling point or initial boiling point and boiling range:	252.7°C at 760mmHg
Flammability:	Combustible. Gives off irritating or toxic fumes (or gases) in a fire.

Lower and upper explosion limit/flammability limit:	no data available
Flash point:	250°C
Auto-ignition temperature:	greater than 700° F (NTP, 1992)
Decomposition temperature:	no data available
pH:	pH of 0.2 molar aqueous solution: 8.4
Kinematic viscosity:	no data available
Solubility:	>21 [ug/mL]
Partition coefficient n-octanol/water:	log Kow = -2.18 at pH 7-9, 20 deg C
Vapour pressure:	<0.01 mm Hg (20 °C)
Density and/or relative density:	1.331
Relative vapour density:	4.9 (NTP, 1992) (Relative to Air)
Particle characteristics:	no data available

SECTION 10: Stability and reactivity

Reactivity

Decomposes on heating and on burning. This produces toxic and corrosive gases including formaldehyde, ammonia, hydrogen cyanide and nitrogen oxides. The solution in water is a weak base. Reacts with strong oxidants and strong acids. Attacks aluminium and zinc.

Chemical stability

Stable under recommended storage conditions.

Possibility of hazardous reactions

Combustible.Dust explosion possible if in powder or granular form, mixed with air.HEXAMETHYLENETETRAMINE is hygroscopic. It is sensitive to exposure to heat. This chemical is incompatible with oxidizing agents. It is also incompatible with acids. It reacts violently with sodium peroxide. It reacts explosively with 1-bromopentaborane(9) at temperatures above 194° F. The complex with iodine deflagrates at 280° F. The 1:1 addition complex with iodoform has exploded at 352° F. It is corrosive to some metals, such as aluminum and zinc (NTP, 1992). Special Hazards of Combustion Products: Formaldehyde gas and ammonia may be given off when hot (USCG, 1999).

Conditions to avoid

no data available

Incompatible materials

Incompatible materials: Strong acids, acids, strong oxidizing agents

Hazardous decomposition products

When heated to decomposition it emits toxic fumes of formaldehyde and /nitrogen oxides/.

SECTION 11: Toxicological information

Acute toxicity

Oral: no data available

Inhalation: no data available

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

no data available

Reproductive toxicity

no data available

STOT-single exposure

The substance is mildly irritating to the eyes and skin.

STOT-repeated exposure

Repeated or prolonged contact may cause skin sensitization. Repeated or prolonged inhalation may cause asthma.

Aspiration hazard

Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly when dispersed.

SECTION 12: Ecological information

Toxicity

Toxicity to fish: LC50; Species: Pimephales promelas (Fathead Minnow) 33 days, length 18.8 mm, weight 0.096 g; Conditions: freshwater, flow through, 25.2 deg C, pH 7.8, hardness 44.9 mg/L CaCO3, dissolved oxygen 5.8 mg/L; Concentration: 49800000 ug/L for 96 hr (95% confidence interval: 44600000-55600000 ug/L) /99% purity

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

AEROBIC: In a closed bottle test using a secondary activated sludge inoculum, methenamine was found to be readily biodegradable with 70% biodegraded after 28 days(1). Methenamine was categorized as a synthetic organic chemical unlikely to be removed during biological sewage treatment, even after prolonged exposure of the biota(2). In a 5-day BOD test using a sewage seed, methenamine reached 2.02% of its theoretical BOD(3). Using an activated sludge inoculum, up to 87% removal of methenamine was observed after a 28 day incubation period(4). Methenamine was not degraded in the SCAS test, but it was degraded during 28-day die-away tests(5); no rates were given(SRC). Methenamine, present at 30 mg/L, reached 22% of its theoretical BOD in 2 weeks using an activated sludge inoculum at 100 mg/L in the Japanese MITI test(6); degradation based on TOC and other parameters was 48% suggesting an abiotic hydrolysis component of the degradation(SRC). Methenamine was degraded in various screening tests (>70% DOC, >60% ThoD), but not in activated sludge simulation tests (<25% DOC removal)(7); it was suggested that methenamine would undergo hydrolysis or auto-oxidation in the 28-day screening tests to form biodegradable products, which are not produced in sufficient quantity in 3-hour simulation tests(7). It was observed that methenamine could inhibit degradation, by lowering microbial populations, in both sewage and activated sludge tests depending on concentration(8). Various biological screening studies have observed between 28-100% degradation of methenamine(9); part (or most) of the degradation can be explained by hydrolysis to form formaldehyde and ammonia followed by biodegradation(9); the degradation rate increases with acidity(9).

Bioaccumulative potential

An estimated BCF of 3 was calculated in fish for methenamine(SRC), using a log Kow of -2.18(1) and a regression-derived equation(2). According to a classification scheme(2), this BCF suggests the potential for bioconcentration in aquatic organisms is low(SRC).

Mobility in soil

Using a structure estimation method based on molecular connectivity indices(1), the Koc for methenamine can be estimated to be about 10(SRC). According to a classification scheme(2), this estimated Koc value suggests that methenamine is expected to have very high mobility in soil(SRC). The pKa of methenamine is 4.89(3), indicating that this compound will exist partially in cation form in the environment and cations generally adsorb more strongly to soils containing organic carbon and clay than their neutral counterparts(4).

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: UN1328 (For reference only, please check.)
IMDG: UN1328 (For reference only, please check.)
IATA: UN1328 (For reference only, please check.)

UN Proper Shipping Name

ADR/RID: HEXAMETHYLENE- TETRAMINE (For reference only, please check.)
IMDG: HEXAMETHYLENE- TETRAMINE (For reference only, please check.)
IATA: HEXAMETHYLENE- TETRAMINE (For reference only, please check.)

Transport hazard class(es)

ADR/RID: 4.1 (For reference only, please check.)
IMDG: 4.1 (For reference only, please check.)
IATA: 4.1 (For reference only, please check.)

Packing group, if applicable

ADR/RID: III (For reference only, please check.)
IMDG: III (For reference only, please check.)
IATA: III (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

Listed.

China Catalog of Hazardous chemicals 2015

Listed.

New Zealand Inventory of Chemicals (NZIoC)

Listed.

(PICCS)

Listed.

Vietnam National Chemical Inventory

Listed.

IECSC)

Listed.

Korea Existing Chemicals List (KECL)

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?pageID=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

ECHA - European Chemicals Agency, website: https://echa.europa.eu/

Other Information

The substance may release formaldehyde. See ICSC 0695. Anyone who has shown symptoms of asthma due to this substance should avoid all further contact. The symptoms of asthma often do not become manifest until a few hours have passed and they are aggravated by physical effort. Rest and medical observation are therefore essential.