

# SAFETY DATA SHEETS

According to the UN GHS revision 9

Version: 1.0  
Creation Date: July 15, 2019  
Revision Date: July 15, 2019

## SECTION 1: Identification

### 1.1 GHS Product identifier

Product name Methenamine

### 1.2 Other means of identification

Product number -

Other names Hexamethylenetet; Hexamethylenetetramine; methenamine

### 1.3 Recommended use of the chemical and restrictions on use

Identified uses Industrial and scientific research use.

Uses advised against no data available

### 1.4 Supplier's details

Company Shanghai Baishun Biotechnology Co., Ltd  
Address No. 26, Lane 918, Lianye Road, Zhelin Town, Fengxian District, Shanghai, 201400, China  
Telephone +86-21-37581181

### 1.5 Emergency phone number

Emergency phone number +86-21-37581181

Service hours Monday to Friday, 9am-5pm (Standard time zone: UTC/GMT +8 hours).

## SECTION 2: Hazard identification

### 2.1 Classification of the substance or mixture

Flammable solids, Category 2  
Skin sensitization, Category 1

### 2.2 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.
<b>Response</b>	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.
<b>Storage</b>	none
<b>Disposal</b>	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.

### 2.3 Other hazards which do not result in classification

no data available

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## SECTION 3: Composition/information on ingredients

### 3.1 Substances

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

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## SECTION 4: First-aid measures

### 4.1 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 .

### 4.2 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)

#### **4.3 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

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### **SECTION 5: Fire-fighting measures**

#### **5.1 Suitable extinguishing media**

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

#### **5.2 Specific hazards arising from the chemical**

Special Hazards of Combustion Products: Formaldehyde gas and ammonia may be given off when hot. (USCG, 1999)

#### **5.3 Special protective actions for fire-fighters**

Use water spray, foam, powder.

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### **SECTION 6: Accidental release measures**

#### **6.1 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.

#### **6.2 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.

#### **6.3 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.

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### **SECTION 7: Handling and storage**

#### **7.1 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.

#### **7.2 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

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## SECTION 8: Exposure controls/personal protection

### 8.1 Control parameters

#### Occupational Exposure limit values

MAK sensitization of skin (SH)

#### Biological limit values

no data available

### 8.2 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.

### 8.3 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

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## SECTION 9: Physical and chemical properties and safety characteristics

<b>Physical state</b>	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)
<b>Colour</b>	Crystallizes from ethanol as colorless, hygroscopic rhombododecahedra.
<b>Odour</b>	Odorless
<b>Melting point/freezing point</b>	280°C
<b>Boiling point or initial boiling point and boiling range</b>	252.7°C at 760mmHg
<b>Flammability</b>	Combustible. Gives off irritating or toxic fumes (or gases) in a fire.
<b>Lower and upper explosion limit/flammability limit</b>	no data available
<b>Flash point</b>	250°C
<b>Auto-ignition temperature</b>	greater than 700° F (NTP, 1992)
<b>Decomposition temperature</b>	no data available
<b>pH</b>	pH of 0.2 molar aqueous solution: 8.4
<b>Kinematic viscosity</b>	no data available
<b>Solubility</b>	>21 [ug/mL]
<b>Partition coefficient n-</b>	log Kow = -2.18 at pH 7-9, 20 deg C

octanol/water	
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

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## SECTION 10: Stability and reactivity

### 10.1 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.

### 10.2 Chemical stability

Stable under recommended storage conditions.

### 10.3 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).

### 10.4 Conditions to avoid

no data available

### 10.5 Incompatible materials

Incompatible materials: Strong acids, acids, strong oxidizing agents

### 10.6 Hazardous decomposition products

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

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## 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.

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## **SECTION 12: Ecological information**

### **12.1 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 CaCO<sub>3</sub>, 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

### **12.2 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).

### **12.3 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).

### **12.4 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).

### **12.5 Other adverse effects**

no data available

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## SECTION 13: Disposal considerations

### 13.1 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.

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## SECTION 14: Transport information

### 14.1 UN Number

ADR/RID: UN1328 (For reference only, please check.)

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

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

### 14.2 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.)

### 14.3 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.)

### 14.4 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.)

### 14.5 Environmental hazards

ADR/RID: No

IMDG: No

IATA: No

### 14.6 Special precautions for user

no data available

### 14.7 Transport in bulk according to IMO instruments

no data available

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## SECTION 15: Regulatory information

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

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

<b>Philippines Inventory of Chemicals and Chemical Substances (PICCS)</b>	Listed.
<b>Vietnam National Chemical Inventory</b>	Listed.
<b>Chinese Chemical Inventory of Existing Chemical Substances (China IECSC)</b>	Listed.
<b>Korea Existing Chemicals List (KECL)</b>	Listed.

## SECTION 16: Other information

### Information on revision

**Creation Date** July 15, 2019  
**Revision Date** July 15, 2019

### 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](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.

**Any questions regarding this SDS, Please send your inquiry to [sds@xixisys.com](mailto:sds@xixisys.com)**

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