

## MATERIAL SAFETY DATA SHEET

### 1 IDENTIFICATION

**Details of the supplier of the safety data sheet :**

**Company** : Nanohelix Co., Ltd.  
**Address** : A-dong and B-dong, 43-15, Techno 5-ro, Yuseong-gu, Daejeon 34014  
 Republic of Korea  
**Telephone Number** : +82-42-867-9055  
**Fax Number** : +82-42-867-9057  
<https://www.nanohelix.net>

**Information department :**

**Quality control, Nanohelix Co., Ltd.**  
**E-mail** : info@nanohelix.net  
**Product Name** : PCRB  
**U.N.Number** : None allocated  
**Dangerous Goods Class and Subsidiary Risk** : None allocated  
**Hazchem Code** : None allocated  
**Poison Schedule** : None allocated  
**Use** : Laboratory chemicals

### 2 HAZARDS IDENTIFICATION

**GHS Classification**

**Acute Toxicity (Oral)** : Category 4  
**Skin Irritation** : Category 2  
**Serious Eye Damage** : Category 1  
**Acute aquatic toxicity** : Category 3

**GHS Label element**

**Hazard pictograms**



**Signal word** : Danger

**Hazard Statements** : H302 - Harmful if swallowed  
 : H314 - Causes severe skin burns and eye damage.  
 : H315 - Causes skin irritation.  
 : H318 - Causes serious eye damage.  
 : H412 - Harmful to aquatic life with long-lasting effects.

**Precautionary statements** : P260 - Do not breathe dust.  
 : P264 - Wash hands thoroughly after handling.  
 : P270 - Do not eat, drink or smoke when using this product.  
 : P273 - Avoid release to the environment.  
 : P280 - Wear protective gloves/ protective clothing/ eye protection/ face protection.  
 : P302 + P352 - IF ON SKIN : Wash with plenty of soap and water.  
 : P332 + P313 - IF SKIN irritation occurs : Get medical advice/ attention.  
 : P362 + P364 - Take off contaminated clothing and wash it before reuse.  
 : P301 + P312 – IF WSALLOWED: call a POISON CENTER/ doctor/ if you feel unwell.

- : P301 + P330 + P331 - IF SWALLOWED : Rinse mouth.  
Do NOT induce vomiting.
- : P303 + P361 + P353 - IF ON SKIN (or hair) : Take off immediately all contaminated clothing. Rinse skin with water/ shower.
- : P363 - Wash contaminated clothing before reuse.
- : P304 + P340 + P310 - IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/ doctor.
- : P305 + P351 + P338 - IF IN EYES : Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do - continue rinsing.
- : P405 - Store locked up.
- : P501 - Dispose of contents/ container according to waste-related laws.

### 3 | COMPOSITION/ INFORMATION ON INGREDIENTS

- Substance / Mixture Description** : Mixture  
: The product is a mixture of the hazardous substances listed below along with unlisted nonhazardous substances. The exact concentration percentages of the hazardous substances may be withheld as a Nanohelix Co., Ltd. trade secret.
- Synonyms (Guanidine thiocyanate)** : Guanidinium rhodanide  
Guanidinium thiocyanate
- Formula (Guanidine thiocyanate)** :  $\text{CH}_5\text{N}_3\cdot\text{CHNS}$
- Molecular weight (Guanidine thiocyanate)** : 118.16 g/mol
- Synonyms (Acetic acid)** : Glacial acetic acid
- Formula (Acetic acid)** :  $\text{C}_2\text{H}_4\text{O}_2$
- Molecular weight (Acetic acid)** : 60.05 g/mol
- Synonyms (Potassium Acetate)** : Potassium salt
- Formula (Potassium Acetate)** :  $\text{C}_2\text{H}_3\text{O}_2\text{K}$
- Molecular weight (Potassium Acetate)** : 98.15 g/mol

#### Hazardous ingredients

Name	CAS No.	EC No.	Weight (%)
Guanidine thiocyanate	593-84-0	209-812-1	>=25 - <30
Acetic acid	64-19-7	200-580-7	>=1 - <5
Potassium acetate	127-08-2	204-822-2	>=10 - <15

### 4 | FIRST-AID MEASURES

- General advice** : Show this material safety data sheet to the doctor in attendance.
- If inhaled** : Move to fresh air. If symptoms persist, call a physician.
- In case of skin contact** : Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes.  
If symptoms persist, call a physician.
- In case of eye contact** : Remove contact lenses. Protect unharmed eye.  
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.
- If swallowed** : If accidentally swallowed obtain immediate medical attention.  
Rinse mouth with water. Never give anything by mouth to an unconscious person.

**Most important symptoms and effects, both acute and delayed** : No information available.  
Causes skin irritation. Causes serious eye damage.

**Notes to physician** : No information available.

## 5 | FIRE FIGHTING MEASURES

**Suitable extinguishing media** : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

**Specific hazards during fire fighting** : Do not allow run-off from fire fighting to enter drains or water courses.  
Exposure to decomposition products may be a hazard to health.

**Hazardous combustion products** : Potassium oxide, Carbon oxides, Nitrogen oxides (NOx), Sulfur oxies.

**Further information** : In the event of fire and/or explosion do not breathe fumes.

**Special protective equipment for fire-fighters** : Wear self-contained breathing apparatus for firefighting if necessary.

## 6 | ACCIDENTAL RELEASE MEASURES

**Personal precautions, protective equipment and emergency procedures** : Use personal protective equipment. Avoid breathing dust/ fume/ gas/ mist/ vapors/ spray.

**Environmental precautions** : Prevent product from entering drains.  
Prevent further leakage or spillage if safe to do so.

**Methods and material for containment and cleaning up** : Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust).  
Keep in suitable, closed containers for disposal.

## 7 | HANDLING AND STORAGE

**Advice on protection against fire and explosion** : Normal measures for preventive fire protection.

**Advice on safe handling** : For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. Dispose of rinse water in accordance with local and national regulations.

**Conditions for safe storage** : Keep container tightly closed in a dry and well-ventilated place.  
Do not store near acids.

## 8 | EXPOSURE CONTROLS/PERSONAL PROTECTION

### Ingredients with workplace control parameters

Ingredients	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Acetic acid	64-19-7	TWA	10 ppm	KR OEL
Acetic acid	64-19-7	STEL	15 ppm	KR OEL

### Components with DNEL

Ingredients	CAS-No.	Application Area	Routes of exposure	Value	Health effect
Acetic acid	64-19-7	Worker DNEL, acute	Inhalation	25 mg/m <sup>3</sup>	Local effects
Acetic acid	64-19-7	Worker DNEL, longterm	Inhalation	25 mg/m <sup>3</sup>	Local effects
Acetic acid	64-19-7	Consumer DNEL, acute	Inhalation	25 mg/m <sup>3</sup>	Local effects
Acetic acid	64-19-7	Consumer DNEL, longterm	Inhalation	25 mg/m <sup>3</sup>	Local effects

**Components with PNEC**

Ingredients	CAS-No.	Compartment	Value
Acetic acid	64-19-7	Fresh water	3.058 mg/l
Acetic acid	64-19-7	Fresh water sediment	11.36 mg/kg
Acetic acid	64-19-7	Sea water	0.3058 mg/l
Acetic acid	64-19-7	Sea sediment	1.136 mg/kg
Acetic acid	64-19-7	Aquatic intermittent release	30.58 mg/l
Acetic acid	64-19-7	Sewage treatment plant	85 mg/l

**Personal protective equipment**

*Hand protection Remarks*

: The choice of an appropriate glove does not only depend on its material but also on other quality features and is different from one producer to the other. Take note of the information given by the producer concerning permeability and break through times, and of special workplace conditions (mechanical strain, duration of contact).

*Eye protection*

: Safety glasses

*Skin and body protection*

: Choose body protection according to the amount and concentration of the dangerous substance at the work place. Footwear protecting against chemicals.

**Hygiene measures**

: Keep away from food and drink. When using do not eat, drink or smoke.

**9 | PHYSICAL AND CHEMICAL PROPERTIES**

<b>Appearance</b>	: Liquid
<b>Color</b>	: No data available.
<b>Odor</b>	: Characteristic
<b>Odor Threshold</b>	: No data available.
<b>pH</b>	: No data available.
<b>Melting point/range</b>	: No data available.
<b>Boiling point/boiling range</b>	: >40°C
<b>Flash Point</b>	: >101°C (Closed-cup)
<b>Evaporation rate</b>	: No data available.
<b>Burning rate</b>	: No data available.
<b>Upper explosion limit</b>	: No data available.
<b>Lower explosion limit</b>	: No data available.
<b>Vapor pressure</b>	: No data available.
<b>Relative vapor density</b>	: No data available.
<b>Relative density</b>	: No data available.
<b>Density</b>	: No data available.
<b>Solubility(ies)</b>	
<i>Water solubility</i>	: No data available.
<i>Solubility in other solvents</i>	: No data available.
<b>Partition coefficient:</b>	: No data available.
<i>n-octanol/water</i>	
<b>Autoignition temperature</b>	: Not determined.
<b>Decomposition temperature</b>	: No data available.
<b>Viscosity</b>	: No data available.
<i>Viscosity, dynamic</i>	
<i>Viscosity, kinematic</i>	: No data available.
<b>Explosive properties</b>	: No data available.
<b>Oxidizing properties</b>	: No data available.

## 10 STABILITY AND REACTIVITY

<b>Reactivity</b>	: No decomposition if stored and applied as directed.
<b>Chemical stability</b>	: No decomposition if stored and applied as directed.
<b>Possibility of hazardous reactions</b>	: Stable under recommended storage conditions. A risk of explosion and/or of toxic gas formation exists with the following substances: Acids Generates dangerous gases or fumes in contact with: Acids Keep away from oxidizing agents, and acidic or alkaline products.
<b>Conditions to avoid</b>	: No data available.
<b>Incompatible materials</b>	: No data available.
<b>Hazardous decomposition products</b>	: No decomposition if stored and applied as directed.

## 11 TOXICOLOGICAL INFORMATION

<b>Acute toxicity</b>	: Not classified based on available information.
<b><u>Product</u></b>	
<b>Guanidine thiocyanate</b>	
Acute oral toxicity	: LD50 Oral (Rat, female) - 593 mg/kg
Acute inhalation toxicity	: No data available.
Acute dermal toxicity	: No data available.
<b>Acetic acid</b>	
Acute oral toxicity	: LD50 Oral (Rat) - 3,310 mg/kg.
Acute inhalation toxicity	: LC50 Inhalation (Mouse) - 2,819 mg/l - 4h.
Acute dermal toxicity	: LD50 Dermal (Rabbit) - 1,112 mg/kg
<b>Potassium acetate</b>	
Acute oral toxicity	: LD50 Oral (Rat) - 3,250 mg/kg.
Acute inhalation toxicity	: No data available.
Acute dermal toxicity	: No data available.
<b>Skin corrosion/irritation</b>	: Causes skin irritation.
<b><u>Product</u></b>	
<b>Guanidine thiocyanate</b>	: Remark - Cause skin burns. Species - Rabbit Result - Corrosive after 1 to 4 hours of exposure - 4 h
<b>Acetic acid</b>	: Remark - May irritate skin.
<b>Potassium acetate</b>	: No skin irritation.
<b>Serious eye damage/eye irritation</b>	: Causes serious eye damage.
<b><u>Product</u></b>	
<b>Guanidine thiocyanate</b>	: Remark - May cause serious eye damage.
<b>Acetic acid</b>	: Remark - May cause irreversible eye damage.
<b>Potassium acetate</b>	: No eye irritation.
<b>Respiratory or skin sensitization</b>	: No data available.
<b><u>Product</u></b>	
<b>Acetic acid</b>	: Remark - May cause sensitization by inhalation and skin contact.
<b>Germ cell mutagenicity</b>	: Not classified based on available information.
<b>Carcinogenicity</b>	: Not classified based on available information.
<b>IARC</b>	: No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed

<b>OSHA</b>	human carcinogen by IARC. : No ingredient of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.
<b>NTP</b>	: No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
<b>Reproductive toxicity</b>	: Not classified based on available information.
<b>STOT-single exposure</b>	: Not classified based on available information.
<b>STOT-repeated exposure</b>	: Not classified based on available information.
<b>Aspiration toxicity</b>	: Not classified based on available information.
<b>Further information</b>	: No data available.

## 12 ECOLOGICAL INFORMATION

### **Ecotoxicity**

#### **Product**

#### **Guanidine thiocyanate**

*Toxicity to fish* : LC50 (Poecilia reticulata (guppy)) - 89.1 mg/l - 96 h

*Toxicity to algae* : ErC50 (Desmodesmus subspicatus) - 130 mg/l - 72 h

*Toxicity to bacteria* : EC50 (Activated sludge) - > 185 mg/l - 28 h .

#### **Acetic acid**

*Toxicity to fish* : LC50 (Oncorhynchus mykiss (rainbow trout)) - 1,000 mg/l - 96h

*Toxicity to algae* : EC50 (Skeletonema costatum) - > 1,000 mg/l - 72h

*Toxicity to bacteria* : EC5 (Pseudomonas putida) - 2,850 mg/l - 16h.

*Toxicity to daphnia and other aquatic invertebrates* : EC50 (Daphnia magna (Water flea)) - 300.82 mg/l - 48h

#### **Potassium acetate**

*Toxicity to fish* : LC50 (Danio rerio (zebra fish)) - 992 mg/l - 96 h

*Toxicity to algae* : EC50 (Skeletonema costatum(marine diatom))-1,000 mg/l - 72 h

*Toxicity to daphnia and other aquatic invertebrates* : EC50 (Daphnia) - > 919 mg/l - 48 h .

**Persistence and degradability** : No data available.

**Bioaccumulative potential** : No data available.

**Mobility in soil** : No data available.

#### **Other adverse effects**

#### **Product**

*Ozone-Depletion Potential* : Regulation - 40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I Substances

Remarks - This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

**Additional ecological information** : No data available.

## 13 DISPOSAL CONSIDERATION

### **Disposal methods**

*Waste from residues* : The product should not be allowed to enter drains, water courses or the soil.

Dispose of contents/container in accordance with local regulation.

*Contaminated packaging* : Dispose of as unused product. Do not re-use empty containers.

#### 14 TRANSPORT INFORMATION

<b>UNRTDG</b>	: Not regulated as a dangerous good.
<b>IATA-DGR</b>	: Not regulated as a dangerous good.
<b>IMDG-Code</b>	: Not regulated as a dangerous good.
<b>Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code</b>	: No data available.
<b>Domestic regulation</b>	
<b>49 CFR</b>	: Not regulated as a dangerous good.

#### 15 REGULATORY INFORMATION

##### EPCRA - Emergency Planning and Community Right-to-Know

**SARA 304** : This material does not contain any components with a section 304 EHS RQ.

**SARA 311/312 Hazards** : No SARA Hazards.

**SARA 302** : No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

**SARA 313** : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

##### US State Regulations

**California Prop. 65** : This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects.

##### TSCA list

No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

#### 16 OTHER INFORMATION

##### a. List of references

**b. Issuing date** : Oct. 16, 2018

**c. Version** : 3

**d. Revision Date** : Aug. 28, 2024

##### e. Further information

The data provided in this Material Safety Data Sheet is based on current experience and knowledge. The purpose of this Material Safety Data Sheet is to describe products in terms of their safety requirements. This data given is designed only as a guidance for safe handling, use, storage, transportation, disposal and is not to be considered quality specification or warranty. The above details do not imply any guarantee concerning composition or performance of this product.