

SAFETY DATA SHEET

SDS No.1022-0004

Revised date October 11, 2016

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1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME : TMSI-H
NAME OF MANUFACTURER : GL Sciences Inc.
ADDRESS : 22-1 Nishishinjuku 6-chome Shinjuku-ku Tokyo 163-1130, Japan
CHARGE SECTION : International Sales Section
TELEPHONE No. : +81-3-5323-6620
FACSIMILE No. : +81-3-5323-6621
PRODUCT No. : 1022-11150, 1022-11151
SDS No. : 1022-0004
Research use only.

2. HAZARDS IDENTIFICATION

GHS CLASSIFICATION : Flammable liquids : Category 2
Acute toxicity - oral - : Category 4
Acute toxicity - dermal - : Category 3
Acute toxicity - inhalation - : Category 4
Skin corrosion/irritation : Category 1
Eye damage/irritation : Category 1
Carcinogenicity : Category 2
Reproductive toxicity : Category 2
Specific target organ toxicity (Single exposure) : Category 1<respiratory system, nervous system>
Specific target organ toxicity (Single exposure) : Category 3(anesthesia)
Specific target organ toxicity (Repeated exposure) : Category 1<liver, kidneys, nervous system>
Specific target organ toxicity (Repeated exposure) : Category 2<blood system>
Hazardous to the aquatic environment - Acute hazard : Category 1
Hazardous to the aquatic environment - Chronic hazard : Category 1

HAZARD SYMBOL :



SIGNAL WORD : Danger

HAZARD STATEMENTS :

H225 Highly flammable liquid and vapour
H302 Harmful if swallowed
H311 Toxic in contact with skin
H332 Harmful if inhaled
H314 Cause severe skin burns and eye damage
H318 Cause serious eye damage
H351 Suspected of causing cancer
H361 Suspected of damaging fertility or the unborn child
H370 Cause damage to organs<respiratory system, nervous system>
H336 May cause drowsiness or dizziness
H372 Cause damage to organs through prolonged or repeated exposure<liver, kidneys, nervous system>
H373 May cause damage to organs through prolonged or repeated exposure<blood system>
H400 Very toxic to aquatic life

| | |
|-----------------------------------|--|
| H410 | Very toxic to aquatic life with long lasting effects |
| PRECAUTIONARY STATEMENTS : | |
| P202 | Do not handle until all safety precautions have been read and understood. |
| P210 | Keep away from heat/sparks/open flames/hot surfaces. –No smoking. |
| P233 | Keep container tightly closed. |
| P240 | Ground/bond container and receiving equipment. |
| P241 | Use explosion-proof electrical/ventilating/lighting/equipment. |
| P242 | Use only non-sparking tools. |
| P243 | Take precautionary measures against static discharge. |
| P260 | Do not breathe fume/gas/mist/vapours. |
| P264 | Wash hands thoroughly after handling. |
| P270 | Do not eat, drink or smoke when using this product. |
| P271 | Use only outdoors or in a well-ventilated area. |
| P280 | Wear protective gloves/protective clothing/eye protection/face protection. |
| P273 | Avoid release to the environment. |
| P310 | Immediately call a POISON CENTER or doctor. |
| P303+P361+ P353 | IF ON SKIN: Take off immediately all contaminated clothing. Rinse skin with water/shower. |
| P361+P364 | Take off immediately all contaminated cloth and wash it before reuse. |
| P363 | Wash contaminated clothing before reuse. |
| P370+P378 | In case of fire: Use appropriate media such as chemical powder or carbon dioxide to extinguish. |
| P301+P312 | IF SWALLOWED: Call a POISON CENTER or doctor if you feel unwell. |
| P330 | Rinse mouth. |
| P304+P340 | IF INHALED: Remove person to fresh air and keep comfortable for breathing. |
| P301+P330+P331 | IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. |
| P305+ P351+ P338 | IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. |
| P308+P313 | IF exposed or concerned: Get medical advice/attention. |
| P391 | Collect spillage. |
| P403+ P233+P235 | Store in a well-ventilated place. Keep container tightly closed. Keep cool. |
| P405 | Store locked up. |
| P501 | Dispose of contents/container in accordance with all applicable regulations. |

3. COMPOSITION/INFORMATION ON INGREDIENTS

| CHEMICAL IDENTITY | CONTENT | CHEMICAL FORMULA | CAS No. | TSCA INVENTORY | EINECS No. | EC INDEX No. |
|------------------------------|--------------|---|----------|----------------|------------|-----------------|
| Pyridine | approx. 77 % | C ₅ H ₅ N | 110-86-1 | Listed | 203-809-9 | 613-002-00-7 |
| Hexamethyldisilazane (HMDS) | 15 - 16 % | (CH ₃) ₃ SiNHSi(CH ₃) ₃ | 999-97-3 | Listed | 213-668-5 | Not established |
| Trimethylchlorosilane (TMCS) | 7 - 8 % | (CH ₃) ₃ SiCl | 75-77-4 | Listed | 200-900-5 | Not established |

4. FIRST AID MEASURES

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|----------------|---|
| GENERAL ADVICE | : Consult a physician immediately. Show this safety data sheet to the doctor in attendance. |
| INHALATION | : Move victim to fresh air. If breathing is difficult, give oxygen. If irritation persists, consult a physician. |
| SKIN CONTACT | : Remove contaminated clothes and shoes, rinse skin with plenty of water or shower. Use soap to help assure removal. Consult a physician immediately. |
| EYE CONTACT | : Flush eyes well with flooding large amounts of running water for at least 15 minutes. Assure adequate flushing by separating the eyelids with sterile fingers. If possible, remove any contact lenses. Consult a physician immediately. |
| INGESTION | : Rinse mouth, give plenty of water to dilute the substance. Do not induce vomiting. Never give anything by mouth to an unconscious person. Consult a physician immediately. |

MOST IMPORTANT SYMPTOMS AND EFFECTS

- : May cause headache, dizziness and sleepiness.
- May cause chemical injury or conjunctivitis by contacting with eyes/skin.
- May cause stomachache, diarrhea, dizziness, headache, retching, vomiting, consciousness and weakness by ingestion.

5. FIRE FIGHTING MEASURES

- EXTINGUISHING MEDIA** : Water spray, alcohol-resistant foam, dry chemical or carbon dioxide.
- FIRE & EXPLOSION HAZARDS** : Toxic, irritating, dust/fume/smoke may be emitted. Carbon monoxide may be foamed.
- SPECIAL PROTECTIVE EQUIPMENT FOR FIRE FIGHTERS** : Firemen should wear normal protective equipment(full bunker gear) and positive-pressure self-contained breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES

- PERSONAL PRECAUTIONS** : Remove ignition sources and ventilate the area. In case of insufficient ventilation, wear suitable respiratory equipment. Avoid raising dust and avoid contact with skin and eyes.
- ENVIRONMENTAL PRECAUTIONS** : Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.
- METHODS FOR CLEAN UP** : Do not touch spilled material without suitable protection. Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

7. HANDLING AND STORAGE

- HANDLING** : Keep away from ignition sources and ventilate the area – No smoking. In case of insufficient ventilation, wear suitable respiratory equipment.
Avoid contact with eyes, skin, and clothing. Avoid inhalation of vapour or mist. Avoid prolonged or repeated exposure. Handle this product with suitable protection.
- STORAGE** : Store away from sunlight, heat and all ignition sources in an explosion-proof refrigerator (2-10°C).
- INCOMPATIBLE PRODUCTS** : Strong oxidizers, acids

8. EXPOSURE CONTROL/PERSONAL PROTECTION

- ENGINEERING MEASURES** : Use exhaust ventilation to keep airborne concentrations below exposure limits. Use adequate ventilation.
 - VENTILATION** : Local Exhaust ; Necessary, Mechanical(General) ; Necessary
 - PERSONAL PROTECTION**
 - Respiratory protection** : Use respirators approved under appropriate government standards and follow all regulations.
 - HAND PROTECTION** : Chemical resistant gloves
 - EYE PROTECTION** : Safety glasses(goggles)
 - SKIN PROTECTION** : Protective clothing
- CONTROL PARAMETERS (Pyridine)**

| Components | ACGIH | OSHA | NIOSH REL |
|------------|-----------------|-------------------------------|-----------|
| Pyridine | 1 ppm | 5 ppm (15 mg/m ³) | |
| HMDS | Not established | | |
| TMCS | | | |

9. PHYSICAL AND CHEMICAL PROPERTIES

- APPEARANCE** : Colorless, clear liquid
- ODOR** : Characteristic odor
- pH** : No data available
- BOILING POINT** : approx.116 °C(Pyridine)
- MELTING POINT** : -42 °C(Pyridine)
- FLASH POINT** : 20 °C(TCC)(Pyridine)
- EXPLOSIVE LIMITS** : 1.8 - 12.4 %(Pyridine)
- VAPOR PRESSURE** : 26hPa (at 25°C)(Pyridine)
- VAPOR DENSITY** : 2.72(Pyridine)

| | |
|---|-------------------------------------|
| SPECIFIC GRAVITY | : 0.98 g/cm ³ (Pyridine) |
| SOLUBILITY IN(Pyridine) | |
| Water | : Miscible |
| Organic solvent | : Miscible in Ethanol, Diethylether |
| PARTITION COEFFICIENT ; n-octanol/water | |
| | : log Pow: 0.65(Pyridine) |
| AUTOIGNITION TEMPERATURE | : 482 °C(Pyridine) |
| DECOMPOSITION TEMPERATURE | |
| | : No data available(Pyridine) |

10. STABILITY AND REACTIVITY

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|----------------------------------|---|
| REACTIVITY | : Deteriorated by sun-light |
| CHEMICAL STABILITY | : No data available |
| CONDITION TO AVOID | : Sunlight, heat, open flames, high temperature, sparks, static electrical charge, other ignition sources, contact with incompatible materials. |
| INCOMPATIBLE MATERIALS | : Oxidizers and strong acids |
| HAZARDOUS DECOMPOSITION PRODUCTS | |
| | : CO, CO ₂ , NO _x . |

11. TOXICOLOGICAL INFORMATION

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| ACUTE TOXICITY -oral- (Pyridine) | : This product is classified in Category 4. : rat; LD50=895mg/kg(calculated)(CERI hazard data 2001-70(2002),ACGIH(7th,2004),IARC77(2004)) |
| ACUTE TOXICITY -dermal- (Pyridine) (HMDS) | : This product is classified in Category 3. : marmot; LD50=1000 mg/kg(Risk assessment vol.3,2004) : rabbit; LD50=547 - 589 mg/kg(SIAP,2009) |
| ACUTE TOXICITY -inhalation- (HMDS) (TMCS) | : This product is classified in Category 4. : rat; LC50=1857 ppm, 4h(SIAP,2009) : rat; LD50=1498 ppm, 4h(IUCLID,2000) |
| SKIN CORROSION/IRRITATION (Pyridine) | : This product is classified in Category 1. : rabbit; sever damage and corrosion (CERI hazard data 2001-70(2002),ACGIH(7th,2004)) |
| (HMDS) (TMCS) | : rabbit; Draize test, moderate to severe damage and necrosis (SIAP,2004) : rabbit; severe corrosion (IUCLID(2000), HSDB(2007)) |
| EYE DAMAGE/EYE IRRITATION (Pyridine) | : This product is classified in Category 1. : rabbit, marmot; severe damage and corneal damage.(CERI hazard data 2001-70(2002), etc.) |
| (TMCS) | : rabbit; moderate to severe conjunctivitis, strong corrosion(HSDB(2007),IUCLID(2000)) |
| RESPIRATORY OR SKIN SENSITIZATION | : No data available |
| GERM CELL MUTAGENICITY | : This product is not classified. |
| CARCINOGENICITY (Pyridine) | : This product is classified in Category 2 according to Pyridine. : Pyridine is classified in Group A3 by ACGIH(2001). |
| REPRODUCTIVE TOXICITY (Pyridine) | : This product is classified in Category 2 according to Pyridine. : There is a description that an extension of the atrophy and the estrous cycle of the testicle an epididymis are recognized.(Risk assessment report vol.2, 2003) |
| SPECIFIC TARGET ORGAN TOXICITY - single exposure - (Pyridine) | : This product is classified in Category 1 and 3 according to Pyridine. : Human; There are descriptions that "Pulmonary congestion and bronchitis" and "Effects on the nervous system with a language disorder".(CERI hazard data 2001-70, 2002). |
| SPECIFIC TARGET ORGAN TOXICITY - repeated exposure - (Pyridine) | : This product is classified in Category 1 and 3 according to Pyridine. : Human: There are descriptions that "Serious damage of the liver and kidney" and "Headache, dizziness, irritability, insomnia, nausea, vomiting ataxia of liver damage, cirrhosis of the liver, the nervous system with a language disorder".(CERI hazard data 2001-70,2002) |

12. ECOLOGICAL INFORMATION

Hazardous to the aquatic environment - Acute hazard

: This product is classified in Category 1 according to Pyridine.

(Pyridine) : Pseudokirchneriella subcapitata; ErC50=0.10 mg/L,72h(Ecological impact test in the Ministry of the Environment, 1995)

Hazardous to the aquatic environment - Chronic hazard

: This product is classified in Category 1 according to Pyridine.

(Pyridine) : Pseudokirchneriella subcapitata; NOEC=0.10 mg/L,72h(Ecological impact test in the Ministry of the Environment, 1995)

BIODEGRADABILITY : There is no rapid degradability in Pyridine (DOC=97%;Zahn-Wellens test)(Risk assessment vol.3,2004).

BOD(HMDS) = 0%

BIOACCUMULATIVE POTENTIAL : No data available

MOBILITY IN SOIL : No data available

OTHER ADVERSE EFFECTS : Not listed in Montreal Protocol list.

13. DISPOSAL INFORMATION

Dispose in a hazardous-waste site in accordance with all applicable regulations. Any disposal practice must be in compliance with country, local, state, and federal laws and regulations (contact country, local or state environment agency for specific rules).

14. TRANSPORT INFORMATION

IATA

UN NUMBER : 2924

UN PROPER SHIPPING NAME : Flammable liquid, corrosive, N.O.S. (Approx. 77%Pyridine solution)

CLASS : 3, flammable liquid

SUB-CLASS : 8, corrosive

PACKING GROUP : II

ADR/RID : 2924, Flammable liquid, corrosive, N.O.S.

DOT : 2924, Flammable liquid, corrosive, N.O.S.

MARINE POLLUTANT : Not classified

15. REGULATORY INFORMATION

US REGULATIONS : Labeling according to EC Directives; See section 2

EU REGULATIONS : Labeling according to EC Directives; See section 2

16. OTHER INFORMATION**NOTICE:**

The information contained in the SDS description is applicable exclusively to the chemical substance identified herein and for its intended use as an analytical reference standard or reagent and to the unit quantity intended for that purpose. The information does not relate to, and may not be appropriate for, any application or larger quantity of the substance described. Our products are intended for the use by individuals possessing sufficient technical skill and qualification on use the material potential hazardous chemical. Accordingly, no representation or warranty, express or implied, with respect to merchantability and fitness for a particular purpose is made with respect to the information contained herein.

Attention:

This product in terms of chemical identity and the unit amount provide is intended for use in chemical analysis and not for human consumption, nor any other purpose.