

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 : N-Solution™
U.N.Number : None allocated
Dangerous Goods Class : None allocated
and Subsidiary Risk
Hazchem Code : None allocated
Poison Schedule : None allocated
Use : Laboratory chemicals

2 HAZARDS IDENTIFICATION

GHS Classification : This material is not classified as hazardous under the Article 104 of the Occupational Safety and Health Act (OSHA). It is not regulated for the MSDS creation and labeling by the provision of Article 110 Paragraph 1 of the OSHA.

GHS Labeling

Signal Word : Not applicable.
Hazard statement(s) : Not applicable.
General advice : Not applicable.

3 COMPOSITION/ INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture
Description : 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 : Methyl sulfoxide
Methylsulfynylmethane
Formula : C₂H₆OS or (CH₃)₂SO
Molecular weight : 78.13 g/mol
Hazardous ingredients

Name	CAS No.	EC No.	Weight (%)
Dimethyl sulfoxide	67-68-5	200-664-3	>=47 - <52

4 FIRST-AID MEASURES

Eye Contact : Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used. Get medical attention if irritation occurs.
Skin Contact : Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops. Cold water may be used.
Serious Skin Contact : Not available.
Inhalation : If inhaled, remove to fresh air. If not breathing, give artificial

Serious Inhalation	respiration. If breathing is difficult, give oxygen. Get medical attention.
Ingestion	: Not available. : Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.
Serious Ingestion	: Not available.

5 FIRE FIGHTING MEASURES

Flammability of the Product	: Combustible
Auto-Ignition Temperature	: 215°C (419°F)
Flash Points	: CLOSED CUP - 89°C (192.2°F). OPEN CUP - 95°C (203°F).
Flammable Limits	: LOWER - 2.6% UPPER - 28.5% (Lewis), 42% (NFPA)
Products of Combustion	: These products are carbon oxides (CO, CO ₂), sulfur oxides (SO ₂ , SO ₃ ...).
Fire Hazards in Presence of Various Substances	: Flammable in presence of open flames and sparks, of heat. Non-flammable in presence of shocks.
Explosion Hazards in Presence of Various Substances	: Risks of explosion of the product in presence of mechanical impact - Not available. Risks of explosion of the product in presence of static discharge - Not available.
Fire Fighting Media and Instructions	: SMALL FIRE - Use DRY chemical powder. LARGE FIRE - Use water spray, fog or foam. Do not use water jet.
Special Remarks on Fire Hazards	: When heated above its boiling point, dimethyl sulfoxide degrades giving off formaldehyde, methyl mercaptan, and sulfur dioxide.
Special Remarks on Explosion Hazards	: Not available.

6 ACCIDENTAL RELEASE MEASURES

Small Spill	: Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.
Large Spill	: Combustible material. Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. If the product is in its solid form : Use a shovel to put the material into a convenient waste disposal container. If the product is in its liquid form : Absorb with an inert material and put the spilled material in an appropriate waste disposal. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system.

7 HANDLING AND STORAGE

Precautions	: Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents.
Storage	: Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible

sources of ignition (spark or flame). Hygroscopic. Sensitive to light. Store in light-resistant containers.

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls	: Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection	: Safety glasses. Synthetic apron. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves (impervious).
Personal Protection in Case of a Large Spill	: Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.
Exposure Limits	: Not available.

9 PHYSICAL AND CHEMICAL PROPERTIES

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

10 STABILITY AND REACTIVITY

Stability	: The product is stable.
Instability Temperature	: Not available.
Conditions of Instability	: Heat, ignition sources, flames, incompatibles
Incompatibility with various substances	: Reactive with oxidizing agents, reducing agents, acids, alkalis

Corrosivity	: Non-corrosive in presence of glass.
Special Remarks on Reactivity	: Hygroscopic. It has a strong water affinity, and if left exposed it will become rapidly diluted. Incompatible with strong oxidants, arylhalides, bromobenzoyl acetanilide, magnesium perchlorate, perchloric acid, and sodium hydroxide, alkali metals, hydrobromic acid, acidic solutions of alkali bromides, organic and inorganic acid chlorides, acid halides, cyanuric chloride, silver fluoride, methyl bromide, sodium hydride, periodic acid, diborane, iodine pentafluoride, silicon tetrachloride, phosphorous halides (phosphorous trichloride), trichloroacetic acid + copper wool, phosphorous trioxide, thionyl chloride, plastics.
Special Remarks on Corrosivity	: Not available.
Polymerization	: Will not occur.

11 TOXICOLOGICAL INFORMATION

Routes of Entry	: Absorbed through skin. Eye contact. Inhalation.
Toxicity to Animals	: Acute oral toxicity (LD ₅₀) - 7920 mg/kg [Mouse]. Acute dermal toxicity (LD ₅₀) - 40000 mg/kg [Rat].
Chronic Effects on Humans	: MUTAGENIC EFFECTS - Mutagenic for mammalian somatic cells. Mutagenic for bacteria and/or yeast. May cause damage to the following organs - blood, kidneys, liver, mucous membranes, skin, eyes.
Other Toxic Effects on Humans	: Slightly hazardous in case of inhalation (lung irritant). Slightly hazardous in case of skin contact (irritant, permeator), of ingestion.
Special Remarks on Toxicity to Animals	: Not available.
Special Remarks on Chronic Effects on Humans	: May cause adverse reproductive effects (female fertility and fetotoxicity - post implantation mortality) and birth defects based on animal data. May cause cancer (tumorigenic) based on animal data. May affect genetic material (mutagenic).

12 ECOLOGICAL INFORMATION

Ecotoxicity	: Not available.
BOD5 and COD	: Not available.
Products of Biodegradation	: Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.
Toxicity of the Products of Biodegradation	: The product itself and its products of degradation are not toxic.
Special Remarks on the Products of Biodegradation	: Not available.

13 DISPOSAL CONSIDERATION

Waste Disposal	: Waste must be disposed of in accordance with federal, state and local environmental control regulations.
-----------------------	--

14 TRANSPORT INFORMATION

UNRTDG	: Not regulated as a dangerous good.
IATA-DGR	: Not regulated as a dangerous good.
IMDG-Code	: Not regulated as a dangerous good.
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	: No data available.
Domestic regulation 49 CFR	: 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 TSCA 12(b) export notification requirements.

16 OTHER INFORMATION

a. List of references

b. Issuing date : Jan. 15, 2019

c. Version : 2

d. Revision Date : Nov. 29, 2022

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.