MSDS COVER SHEET

Product name: Antibody Biotinylation Kit

Cat. No D5014

Components of the Kit:

Sodium Acetate (1M, pH4.0)
Caprylic Acid
Neutralizing Buffer
Solution A
Labeling Buffer
DMSO
Reactive Biotin
Stop Solution
Solution B

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MATERIAL SAFETY DATA SHEET

1. Product and company identification

Product name	*Sodium Acetate (1M, pH4.0)*
Manufacturer/Supplier	*GENOMINE INC.* *VENTURE BLDG. 307 POHANG TECHNO PARK POHANG, KYUNGBUK, 790-834, KOREA.*
Application of the Substance / Preparation	*Refer to the instruction booklet for proper and intended use. Otherwise, contact supplier for specific applications.*
Information in case of emergency	*+82 - 54 - 223 - 2463*

2. Composition/information on ingredients

Chemical Name	CAS number	%	Hazardous
Sodium Acetate	127-09-3	10-15 %	Yes
Water	7732-18-5	85-90 %	No

Substance/preparation : Preparation

There are no ingredients or additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

3. Hazards identification

Emergency Overview

CAUTION! MAY CAUSE IRRITATION TO SKIN, EYES, AND RESPIRATORY TRACT.

SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 1 - Slight
Flammability Rating: 1 - Slight
Reactivity Rating: 1 - Slight
Contact Rating: 1 - Slight
Lab Protective Equip: GOGGLES; LAB COAT; VENT HOOD; PROPER GLOVES
Storage Color Code: Green (General Storage)

Potential Health Effects

Inhalation:
May cause irritation to the respiratory tract. Symptoms may include coughing, sore throat, labored breathing, and chest pain.
Ingestion:
Large doses may produce abdominal pain, nausea, and vomiting.
Skin Contact:
May cause irritation with redness and pain.
Eye Contact:
Contact may cause irritation, redness, and pain.
Chronic Exposure:
No information found.
Aggravation of Pre-existing Conditions:
No information found.

4. First aid measures

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if symptoms appear

Ingestion: Give several glasses of water to drink to dilute. If large amounts were swallowed, get medical advice.

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.

Eye Contact: Immediately flush eyes with plenty of water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get medical attention if irritation persists.

5. Fire-fighting measures

Fire:
Autoignition temperature: 611C (1132F)
As with most organic solids, fire is possible at elevated temperatures or by contact with an ignition source. Listed fire data is for the Anhydrous Material.

Explosion:
Fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard.

Fire Extinguishing Media:
Water spray, dry chemical, alcohol foam, or carbon dioxide.

Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

6. Accidental release measures

Small Spill: Use appropriate tools to put the spilled solid in a convenient waste disposal container. If necessary: Neutralize the residue with a dilute solution of acetic acid. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

Large Spill: Use a shovel to put the material into a convenient waste disposal container. Neutralize the residue with a dilute solution of acetic acid. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system.

7. Handling and storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from any source of heat or ignition. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

8. Exposure controls/personal protection

Airborne Exposure Limits: None established.

Ventilation System: A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved): For conditions of use where exposure to dust or mist is apparent and engineering controls are not feasible, a particulate respirator (NIOSH type N95 or better filters) may be worn. If oil particles (e.g. lubricants, cutting fluids, glycerin, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-face positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection: Wear protective gloves and clean body-covering clothing.

Eye Protection: Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and chemical properties

Appearance: Colorless liquid.

Odor: Sodium acetate has slight acetic acid odor.

Solubility: Sodium acetate solubility is 76 gm/100mls water @ 0C

Density: Sodium acetate has specific gravity of 1.45

pH: 4.0

% Volatiles by volume @ 21C (70F): 0

Boiling Point: Not applicable.

Melting Point: Loses water @ 120C (248F); decomposes @ 324C (615.2F)

Vapor Density (Air=1): No information found.

Vapor Pressure (mm Hg): No information found.

Evaporation Rate (BuAc=1): No information found.

10. Stability and reactivity

Stability: Sodium Acetate is stable under ordinary conditions of use and storage.

Hazardous Decomposition Products: Sodium Acetate emits fumes of acetic acid upon heating and on contact with strong acids.

Hazardous Polymerization: Will not occur for Sodium acetate.

Incompatibilities: Nitric acid, fluoride, potassium nitrate, strong oxidizers and diketene.

Conditions to Avoid: Incompatibles.

11. Toxicological information

Hydrate: Investigated as a mutagen. Anhydrous: Oral rat LD50: 3530 mg/kg; inhalation rat LC50: > 30 gm/m3; skin rabbit LD50: > 10 mg/kg; Irritation Data, standard Draize: Skin rabbit 500 mg/24H, mild; standard Draize, Eye rabbit 10 mg, mild. Investigated as a mutagen.

12. Ecological information

Environmental Fate: No information found on Sodium Acetate.

Environmental Toxicity: No information found.

13. Disposal consideration

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste

management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of Sodium acetate container and unused contents in accordance with federal, state and local requirements

14. Transport information

Not regulated.

15. Regulatory information

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: No Fire: No Pressure: No
Reactivity: No (Pure / Solid)

Australian Hazchem Code: None allocated.

Poison Schedule: None allocated.

WHMIS:

This Sodium acetate MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other information

NFPA Ratings: Health: 1 Flammability: 1 Reactivity: 0
Label Hazard Warning:
CAUTION! MAY CAUSE IRRITATION TO SKIN, EYES, AND RESPIRATORY TRACT.
Label Precautions:
Avoid contact with eyes, skin and clothing.
Avoid breathing dust.
Use with adequate ventilation.
Wash thoroughly after handling.
Keep container closed.
Label First Aid: If Sodium Acetate is inhaled, remove to fresh air. Get medical attention for any breathing difficulty. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Get medical attention if irritation develops or persists.

Disclaimer:

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GENOMINE

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MATERIAL SAFETY DATA SHEET

1. Product and company identification

2. Composition/information on ingredients

Chemical Name	CAS number	%	Hazardous

Product name	***Caprylic acid***
Manufacturer/Supplier	*GENOMINE INC.* *VENTURE BLDG. 307 POHANG TECHNO PARK POHANG, KYUNGBUK, 790-834, KOREA.*
Application of the Substance / Preparation	*Refer to the instruction booklet for proper and intended use. Otherwise, contact supplier for specific applications.*
Information in case of emergency	*+82 - 54 - 223 - 2463*

Caprylic acid	124-07-2	90-100%	Yes

Substance/preparation : Substance

There are no ingredients or additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

3. Hazards identification

Emergency Overview

CAUTION! MAY CAUSE IRRITATION TO SKIN, EYES, AND RESPIRATORY TRACT.

SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 2 - Moderate
Flammability Rating: 1 - Slight
Reactivity Rating: 1 - Slight
Contact Rating: 4 - Extreme (Corrosive)
Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES

Storage Color Code: White (Corrosive)

Potential Health Effects

Inhalation: Mild irritant to nasal passages. May cause coughing or sneezing.
Ingestion: Extremely large oral dosages may produce gastrointestinal disturbances.
Skin Contact: Mild irritant possibly causing soreness after prolonged contact with moist or oily skin.
Eye Contact: Vapors may cause mild irritation. Splashes may cause irritation, redness, pain.
Chronic Exposure: No adverse health effects expected.
Aggravation of Pre-existing Conditions: No information found.

4. First aid measures

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.
Ingestion: If swallowed, give several glasses of water to drink to dilute. If large amounts were swallowed or symptoms occur, get medical advice. Never give anything by mouth to an unconscious person.
Skin Contact: Immediately flush skin with plenty of water for at least 15 minutes. Call a physician if irritation develops.
Eye Contact: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes, lifting upper and lower eyelids occasionally. Call a physician if irritation persists.

5. Fire-fighting measures

Fire: Flash point: 109C (228F) CC
Explosion:
Explosion is possible at or above conditions given above.
Fire Extinguishing Media:
Dry chemical, foam, carbon dioxide, or water spray. Water may be ineffective.
Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

6. Accidental release measures

Caution! Floor and other surfaces may be slippery. Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Neutralize with alkaline material (soda ash, lime), then absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer!

7. Handling and storage

Store in a cool, dry, ventilated area away from sources of heat or ignition. Protect from freezing. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product. Avoid dust formation and control ignition sources. Employ grounding, venting and explosion relief provisions in accord with accepted engineering practices in any process capable of generating dust and/or static electricity. Empty only into inert or non-flammable atmosphere. Emptying contents into a non-inert atmosphere where flammable vapors may be present could cause a flash fire or explosion due to electrostatic discharge. Separate from incompatibles.

8. Exposure controls/personal protection

Airborne Exposure Limits:
None established.
Ventilation System:
In general, dilution ventilation is a satisfactory health hazard control for this substance. However, if conditions of use create discomfort to the worker, a local exhaust system should be considered. A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
Personal Respirators (NIOSH Approved):
For conditions of use where exposure to the substance is apparent and engineering controls are not feasble, consult an industrial hygienist. For emergencies, or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air purifying respirators do not protect workers in oxygen-deficient atmospheres.
Skin Protection:
Wear protective gloves and clean body-covering clothing.
Eye Protection:
Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area. Use chemical safety goggles and/or a full face shield where splashing is possible.

9. Physical and chemical properties

Appearance: Clear, colorless to slightly yellow, oily liquid.
Odor: Faint, fruity acid odor
Solubility: 0.068 g/100 g water @ 20C (68F)
Density: 0.91 @ 20C/4C
pH: No information found.
% Volatiles by volume @ 21C (70F): 0

Boiling Point: 239.7C (464F)
Melting Point: 16.7C (63F)
Vapor Density (Air=1): No information found.
Vapor Pressure (mm Hg): 1 mm @ 780 C.
Evaporation Rate (BuAc=1): No information found.

10. Stability and reactivity

Stability: Stable under ordinary conditions of use and storage.
Hazardous Decomposition Products: Carbon dioxide and carbon monoxide may form when heated to decomposition.
Hazardous Polymerization: Will not occur.
Incompatibilities: Strong oxidizing agents, common metals.
Conditions to Avoid: Temperatures below melting point.

11. Toxicological information

Oral rat LD50: 10,800 mg/kg. Eye, Rabbit, Standard Draize: 500 mg/24 hr. (moderate).
Investigated as a mutagen.

	---NTP Carcinogen---		
Ingredient	Known	Anticipated	IARC Category
Caprylic Acid (124-07-2)	No	No	None

12. Ecological information

Do not allow material to be released to the environment without propergovernmental permits.

13. Disposal consideration

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport information

Not a hazardous material for transportation.
¨ **DOT regulations:**
¨ **Hazard class:** None
¨ **Land transport ADR/RID (cross−border)**
¨ **ADR/RID class:** None

¨ **Maritime transport IMDG:**
¨ **IMDG Class:** None
¨ **Air transport ICAO−TI and IATA−DGR:**
¨ **ICAO/IATA Class:** None
¨ **Transport/Additional information:**
Not dangerous according to the above specifications.

15. Regulatory information

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: No Fire: No Pressure: No
Reactivity: No (Pure / Solid)

Australian Hazchem Code: None allocated.

Poison Schedule: None allocated.

WHMIS:

This Sodium acetate MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other information

NFPA Ratings: Health: **1** Flammability: **1** Reactivity: **0**
Label Hazard Warning:
CAUTION! MAY CAUSE IRRITATION TO SKIN, EYES, AND RESPIRATORY TRACT.
Label Precautions:
Avoid contact with eyes, skin and clothing.
Wash thoroughly after handling.
Avoid breathing vapor or mist.
Keep container closed.
Use with adequate ventilation.

Label First Aid:
In case of contact, immediately flush skin or eyes with plenty of water for at least 15 minutes. Call a physician if irritation develops or persists. If inhaled, remove to fresh air. Get medical attention for any breathing difficulty.

Product Use:
Laboratory Reagent.

Revision Information:
No Changes

Disclaimer:

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GENOMINE
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MATERIAL SAFETY DATA SHEET

1. Product and company identification

Product name	***Neutralizing Buffer***
Manufacturer/Supplier	*GENOMINE INC.* *VENTURE BLDG. 307 POHANG TECHNO PARK POHANG, KYUNGBUK, 790-834, KOREA.*
Application of the Substance / Preparation	*Refer to the instruction booklet for proper and intended use. Otherwise, contact supplier for specific applications.*
Information in case of emergency	*+82 - 54 - 223 - 2463*

2. Composition/information on ingredients

Chemical Name	CAS number	%	SARA 313
Sodium hydroxide solution	None		No
Sodium hydroxide	1310-73-2	0.2-0.4 %	No
Water	7732-18-5	> 99 %	No

Substance/Preparation : Preparation

There are no ingredients or additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

3. Hazards identification

HMIS RATING

HEALTH: 0
FLAMMABILITY: 0
REACTIVITY: 0

NFPA RATING
HEALTH: 0
FLAMMABILITY: 0
REACTIVITY: 0

4. First aid measures

ORAL EXPOSURE
If swallowed, wash out mouth with water provided person is conscious. Call a physician.
INHALATION EXPOSURE
If inhaled, remove to fresh air. If breathing becomes difficult, call a physician.
DERMAL EXPOSURE
In case of contact, immediately wash skin with soap and copious amounts of water.
EYE EXPOSURE
In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

5. Fire-fighting measures

FLASH POINT
N/A
AUTOIGNITION TEMP
N/A
FLAMMABILITY
N/A
EXTINGUISHING MEDIA
Suitable: Water spray. Carbon dioxide, dry chemical powder, or appropriate foam.
FIREFIGHTING
Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.
Specific Hazard(s): Emits toxic fumes under fire conditions.

6. Accidental release measures

METHODS FOR CLEANING UP
Absorb on sand or vermiculite and place in closed containers for disposal. Ventilate area and wash spill

site after material pickup is complete.

7. Handling and storage

HANDLING
User Exposure: Avoid inhalation. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure.

STORAGE
Suitable: Keep tightly closed.

8. Exposure controls/personal protection

ENGINEERING CONTROLS
Safety shower and eye bath. Mechanical exhaust required.

PERSONAL PROTECTIVE EQUIPMENT
Respiratory: Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU). Respiratory protection is not required. Where protection is desired, use multi-purpose combination (US) or type ABEK (EN14387) respirator cartridges.
Hand: Protective gloves.
Eye: Chemical safety goggles.

GENERAL HYGIENE MEASURES
Wash thoroughly after handling.

EXPOSURE LIMITS, RTECS

Country	Source	Type	Value
USA	ACGIH	Ceiling co2 MG/M3	
USA	MSHA Standard	Ceiling co2 MG/M3	
USA	OSHA.	PEL 8H TWA 2 MG/M3	
New Zealand	OEL		
Remarks: check ACGIH TLV			
USA	NIOSH	Ceiling co2 MG/M3/15M	

9. Physical and chemical properties

Appearance Physical State: Clear liquid
Color: Colorless
Property Value At Temperature or Pressure
pH N/A
BP/BP Range N/A
MP/MP Range N/A
Freezing Point N/A

Vapor Pressure N/A
Vapor Density N/A
Saturated Vapor Conc. N/A
SG/Density 1 g/cm3
Bulk Density N/A
Odor Threshold N/A
Volatile% N/A
VOC Content N/A
Water Content N/A
Solvent Content N/A
Evaporation Rate N/A
Viscosity N/A
Surface Tension N/A
Partition Coefficient N/A
Decomposition Temp. N/A
Flash Point N/A
Explosion Limits N/A
Flammability N/A
Autoignition Temp N/A
Refractive Index N/A
Optical Rotation N/A
Miscellaneous Data N/A
Solubility N/A

N/A = not available

10. Stability and reactivity

STABILITY
Stable: Stable.
Materials to Avoid: Strong oxidizing agents.
HAZARDOUS DECOMPOSITION PRODUCTS
Hazardous Decomposition Products: Sodium/sodium oxides.
HAZARDOUS POLYMERIZATION
Hazardous Polymerization: Will not occur

11. Toxicological information

ROUTE OF EXPOSURE
Skin Contact: May cause skin irritation.
Skin Absorption: May be harmful if absorbed through the skin.
Eye Contact: May cause eye irritation.
Inhalation: Material may be irritating to mucous membranes and upper respiratory tract. May be harmful if inhaled.
Ingestion: May be harmful if swallowed.

SIGNS AND SYMPTOMS OF EXPOSURE
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

TOXICITY DATA
Intraperitoneal
Mouse
40 MG/KG
LD50

IRRITATION DATA
Eyes
Monkey
1 %
24H
Remarks: Severe irritation effect
Skin
Rabbit
500 mg
24H
Remarks: Severe irritation effect
Eyes
Rabbit
0.4 mg
Remarks: Mild irritation effect
Eyes
Rabbit
1 %
Remarks: Severe irritation effect
Eyes
Rabbit
0.05 mg
24H
Remarks: Severe irritation effect
Eyes
Rabbit
1 mg
24H
Remarks: Severe irritation effect
Eyes
Rabbit
1 mg
30S

Remarks: Rinsed

CHRONIC EXPOSURE - MUTAGEN
Species: Hamster
Dose: 10 MMOL/L
Cell Type: lung

Mutation test: Cytogenetic analysis

Species: Hamster
Dose: 16 MMOL/L
Cell Type: ovary
Mutation test: Cytogenetic analysis

12. Ecological information

No data available.

13. Disposal consideration

APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION

Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber. Observe all federal, state, and local environmental regulations.

14. Transport information

DOT
Proper Shipping Name: None
Non-Hazardous for Transport: This substance is considered to be non-hazardous for transport.

IATA
Non-Hazardous for Air Transport: Non-hazardous for air transport.

15. Regulatory information

UNITED STATES REGULATORY INFORMATION
SARA LISTED: No
TSCA INVENTORY ITEM: Yes

CANADA REGULATORY INFORMATION
WHMIS Classification: This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.
DSL: Yes
NDSL: No

16. Other information

For R&D use only. Not for drug, household or other uses.

Disclaimer:

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MATERIAL SAFETY DATA SHEET

1. Product and company identification

Product name	*Solution A*
Manufacturer/Supplier	*GENOMINE INC.* *VENTURE BLDG. 307 POHANG TECHNO PARK POHANG, KYUNGBUK, 790-834, KOREA.*
Application of the Substance / Preparation	*Refer to the instruction booklet for proper and intended use. Otherwise, contact supplier for specific applications.*
Information in case of emergency	*+82 - 54 - 223 - 2463*

2. Composition/information on ingredients

Chemical Name	CAS number	%	Hazardous
Proprietary component(S)	NA	50%	No
Water	7732-18-5	50 %	No

Substance/preparation : Preparation

There are no ingredients or additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

3. Hazards identification

HMIS RATING
HEALTH: 0
FLAMMABILITY: 0

REACTIVITY: 0

NFPA RATING
HEALTH: 0
FLAMMABILITY: 0
REACTIVITY: 0

Even though the above listed product(s) are not defined as hazardous by the OSHA Hazard Communication Standard, all materials should be handled with appropriate caution and under competent supervision. Always follow good manufacturing and laboratory practices. Protective gloves, safety glasses or goggles, lab coat and access to a safety shower and eyewash are recommended.

4. Other information

• For R&D use only. Not for drug, household, or other use.

Disclaimer:

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MATERIAL SAFETY DATA SHEET

1. Product and company identification

Product name	*Labeling Buffer*
Manufacturer/Supplier	*GENOMINE INC.* *VENTURE BLDG. 307 POHANG TECHNO PARK POHANG, KYUNGBUK, 790-834, KOREA.*
Application of the Substance / Preparation	*Refer to the instruction booklet for proper and intended use. Otherwise, contact supplier for specific applications.*
Information in case of emergency	*+82 - 54 - 223 - 2463*

2. Composition/information on ingredients

Chemical Name	CAS number	%	Hazardous
Water	7732-18-5	> 99 %	No
Other component	NA	< 1%	No

Substance/preparation : Preparation

There are no ingredients or additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

3. Hazards identification

These Products are classified as mixtures which contain hazardous or non-hazardous ingredients in concentration (less than 1 %). The quantity of hazardous chemical component does not exceed the permissible exposure limit or “Threshold Limit Value”. MSDS are offered by Genomine Inc. since The Hazards Communication Standard set by OSHA does not exempt these mixtures from disclosure.

4. Other information

• For R&D use only. Not for drug, household, or other use.

Disclaimer:

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MATERIAL SAFETY DATA SHEET

1. Product and company identification

Product name	***DMSO***
Manufacturer/Supplier	*GENOMINE INC.* *VENTURE BLDG. 307 POHANG TECHNO PARK POHANG, KYUNGBUK, 790-834, KOREA.*
Application of the Substance / Preparation	*Refer to the instruction booklet for proper and intended use. Otherwise, contact supplier for specific applications.*
Information in case of emergency	*+82 - 54 - 223 - 2463*

2. Composition/information on ingredients

Chemical Name	CAS number	%	Hazardous
Dimethyl sulfoxide (DMSO)	67-68-5	> 99 %	Very few toxic symptoms in humans

Substance/Preparation : Substance

There are no ingredients or additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

3. Hazards identification

WARNING! COMBUSTIBLE LIQUID AND VAPOR
PHYSICAL APPEARANCE: Clear liquid
ODOR: Essentially odorless
EFFECTS OF OVEREXPOSURE:
General: DMSO has shown very few toxic symptoms in humans. The most common are nausea, skin

rashes and an unusual garlic-onion-oyster smell on body and breath.

Inhalation: High vapor concentrations may cause headache, dizziness, and sedation.

Eyes: Low hazard for usual industrial/ commercial handling by trained personnel.

Skin: Stinging and burning of the skin as well as rashes and vesicles have been seen. A heat reaction may occur if applied to wet skin. Avoid contact with DMSO solutions containing toxic material or materials whose toxicological properties are not known. DMSO easily penetrates the skin and may enhance the rate of skin absorption of skin-permeable substances. But because of DMSO's low toxicity and its inability to carry less-permeable substances with it through the skin, it can be concluded that DMSO does not pose a significant threat by skin absorption.

Ingestion: A low ingestion hazard.

HMIS AND NFPA HAZARD RATINGS: Health - 1, Flammability - 1, Chemical Reactivity - 0

Note: HMIS and NFPA ratings involve data and interpretations that may vary from company to company. In both cases the lower the number, the less the hazard. They are intended only for rapid, general identification of the magnitude of the specific hazard. To deal adequately with the safe handling of this material, all the information contained in this MSDS must be considered.

4. First aid measures

NEVER GIVE FLUIDS OR INDUCE VOMITING IF PATIENT IS UNCONSCIOUS OR IS HAVING CONVULSIONS.

General advice:

Remove contaminated clothing promptly (launder before reuse).

Eye Contact:

Flush thoroughly with running water (including under eyelids) for at least 15 minutes. If irritation persists after flushing, seek medical attention.

Skin Contact:

Wash contaminated skin with water. Seek medical attention if irritation persists.

Ingestion:

Seek immediate medical care. Do not induce vomiting.

Inhalation:

Remove to fresh air. If breathing has stopped, provide artificial respiration, keep the victim warm and seek medical attention.

Special advice:

In general, DMSO is not dangerous to people, but like any other chemical, it should be treated with care, respect and common sense.

5. Fire-fighting measures

Combustible liquid and vapor

Extinguishing Media:

Foam, carbon dioxide, dry powder, and water spray.

Special protective equipment for fire-fighters:

Wear a self-contained Breathing Apparatus (SCBA).

Special Exposure Hazards:

Burning dimethyl sulfoxide produces poisonous gases (sulfur oxides). Wear rubber gloves, SCBA, and rubber suit.

Flashpoint and method:

89°C (192°F) closed cup

95°C (203°F) open cup

Flammable Limits (% in air):

LEL: 3.0 - 3.5% by volume

UEL: 42 - 63% by volume

Autoignition Temperature:

300-302°C (572-575°F)

Spill, Leak, or Release:

Note: *Review sections 3, 4, and 5 of this MSDS before proceeding with clean up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean up.*

6. Accidental release measures

Personal Precautions:

In case of mist formation use a respirator or Self-Contained Breathing Apparatus (SCBA).

Environmental Precautions:

If a spill or leak occurs, immediately consult your environmental supervisor. Remove ignition sources. Ventilate the area. Do not breathe the vapor or get liquid in eyes or on skin/clothing.

Spill Clean-up Methods:

Dilute and flush to wastewater treatment or absorb with inert material. Do not allow the material to enter streams or waterways.

Recommended Decontamination Facilities:

Eye bath, water washing facilities

7. Handling and storage

Usage/Handling Precautions:

Keep away from sources of ignition. No Smoking. Do not breathe vapor or mist. Avoid contact with skin, eyes, or clothing.

Storage Precautions:

Keep container tightly closed, in a well-ventilated place. Freezes (solidifies) at 18°C (64°F)

8. Exposure controls/personal protection

Exposure Limits:

ACGIH Threshold Limit Value (TLV): not established

OSHA (USA) Permissible Exposure Limit (PEL, 1989 Table Z-1-A values or section-specific standards): not established

AIHA Workplace Environmental Exposure Level "WEEL" guideline for airborne concentrations in the workplace: 250 ppm (8-hr TWA)

Ventilation:

Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. Use process enclosures, local exhaust ventilation, or other engineering controls to maintain ventilation.

Respiratory Protection:

In case of mist formation use a respirator or SCBA. Respirator type: organic vapor. If respirators are used, a program should be instituted to assure compliance with OSHA standards.

Hand Protection:

Butyl rubber or nitrile (NBR) rubber gloves.

Eye Protection:

Tightly fitting safety goggles.

9. Physical and chemical properties

Appearance: colorless liquid
Odor: essentially odorless
Odor Threshold: not available
pH: 8.5 (50/50 in water)
Boiling Point: 189 ^{o}C (372 ^{o}F)
Flashpoint and method: 89 ^{o}C (192 ^{o}F) closed cup
95 ^{o}C (203 ^{o}F) open cup
Flammable Limits (% in air): LEL: 3.0 - 3.5% by volume
UEL: 42-63% by volume
Autoignition Temperature: 300-302 ^{o}C (572-575 ^{o}F)
Vapor Pressure: 0.55 mbar (0.46 mmHg) @ 20 ^{o}C (68 ^{o}F)
Specific Gravity: 1.1 at 20 ^{o}C (68oF) (water = 1)
Solubility in water at 20 ^{o}C: miscible
Octanol/Water Partition Coefficient: $\log P_{ow} = -2.03$
Viscosity at 25 ^{o}C (77 ^{o}F): 2.0 mPa.s or cP
Vapor Density (Air = 1): 2.7
Evaporation rate (n-butyl acetate = 1): 0.026
Melting Point: 18 ^{o}C (64 ^{o}F)
Sensitivity to Static Discharge: Material is unlikely to accumulate a static charge, which could act as an ignition source.

10. Stability and reactivity

Stability: Stable

Conditions to avoid: Prolonged heating above 150 ^{o}C (302 ^{o}F) can cause rapid, *exothermic* decomposition
Materials to avoid: Organic and inorganic acid chlorides, strong oxidizing agents, alkali metals, hydrobromic acid, acidic solutions of alkali bromides
Hazardous decomposition products: Sulfur dioxide, formaldehyde, methyl mercaptan, dimethyl sulfide, dimethyl disulfide, and bis (methylthio) methane
Hazardous polymerization: Will not occur. *No stabilizers are needed or present.*

11. Toxicological information

Data for Dimethyl Sulfoxide:
Acute Toxicity Data:

Oral LD-50 (male rat): 14,500-28,300 mg/kg

Inhalation (rat): No mortality rate @ 2,900 mg/m^{3} (900 ppm)/ 24 hrs.
Dermal LD-50 (rat): 40,000 mg/kg
Skin irritation (human): Mild
Repeated skin application (human): Slight irritation
Skin sensitization (human): None by EC protocols
Eye irritation (human): None by EC protocols

Subchronic Toxicity Data:[**]

Oral study (13 weeks, rat): LOEL = 8800 mg/kg/day (minor target organ effects: liver) (reduced body weight gain): NOEL = 1100 mg/kg/day
Inhalation study (6 weeks, rat): NOEL = 60ppm

**** Note - definitions for data:**

LOEL = lowest observed effect level **NOAEL =** no observed adverse effect level **NOEL =** no observed effect level.

Developmental Toxicity Data:

DMSO is not considered to be directly embryotoxic and has been shown to be a successful cryoprotectant for mammalian semen and embryos.
A mouse teratology NOEL of 12 g/kg/day has been established based on research with a 50% DMSO solution administered orally. Teratology data suggests that:
1. DMSO is not a teratogen to mammals when administered via oral and dermal routes at dose level that do not produce overt maternal toxicity.
2. DMSO is not a teratogen at low dose levels regardless of the route of administration.
3. The teratogenic potential of DMSO is dependent on route of administration, the dose level and the gestational time of exposure, but in all cases is extremely low or non-existent.

Mutagenicity/Genotoxicity Data:
Salmonella typhimurium assay (Ames test): negative (+/- activation). DMSO is used as a neutral solvent in the Ames mutagen test

12. Ecological information

Introduction:

This environmental effects summary is written to assist in addressing emergencies created by an

accidental spill which might occur during shipment or handling of this material. It is not meant to address discharges to sanitary sewers or publicly owned treatment works.

Aquatic Toxicity:

The LC_{50} (96 hrs.) for ten species of fish range from 32,500 to 43,000 ppm. The LC_{50} for two species of protozoans are 32,000 and 38,000 ppm. The concentration required to inhibit growth (EC_{50}) for five species of blue-green algae and one green algae species ranged from 0.4 to 4.0%. DMSO is non-bio-accumulating since the log of the octanol/water partition coefficient is –2.03.

Phytotoxicity:

Soaking tomato, cucumber, and bean seeds for 18hrs in up to 8% DMSO solutions had no effect on germination rate. DMSO has no effect on the growth rate of corn when sprayed on at rates up to 30 gallon/acre. When diluted with a large amount of water, release of DMSO, directly or indirectly, to the environment is not expected to have significant effect.

Biological Oxygen Demand:

Theoretical Oxygen Demand at 10 ppm: 123 mg oxygen

Chemical Oxygen Demand at 10 ppm: 107 mg/l

Biological Oxygen Demand-5 at 10 ppm: ≤1.0 mg/l

13. Disposal consideration

Waste Disposal:

Dilute and flush to an approved wastewater treatment system. Bacterial decomposition of dimethyl sulfoxide during wastewater treatment can result in the release of dimethyl sulfide (a volatile substance with a strong disagreeable odor). Waste DMSO can also be incinerated in an approved furnace where permitted. Consult federal, state or local authorities for proper disposal procedures.

Empty Containers:

Should be transported/delivered using a registered waste carrier for recycling or waste disposal in accordance with local regulations.

14. Transport information

DOT (USA) Status:

Bulk (>119 gallons per container)

Proper shipping name: Combustible liquid, N.O.S. (Dimethyl Sulfoxide)

Hazard Class: Combustible liquid

I.D. Number: NA 1993

Packing Group: III

Reportable Quantity: N/A

Placards: 1993 (Combustible)

Quantity limitations: None

Drum (<119 gallons per container)

Proper shipping name: Dimethyl Sulfoxide

Hazard Class: Not regulated

I.D. Number: None

Packing Group: None

Label(s): None

TDG (Canada) Status: unregulated.
ICAO - International Civil Aviation Organization status: unregulated
IATA - International Air Transport Agency status: unregulated
ADR and IMDG - International Dangerous Goods status: unregulated

15. Regulatory information

This document has been prepared in accordance with the MSDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200.
Occupational Safety and Health Administration "OSHA" hazardous chemical(s): Dimethyl sulfoxide
Material(s) known to the State of California to cause cancer: None
5 **MATERIAL SAFETY DATA SHEET August 20, 2004 DIMETHYL SULFOXIDE (DMSO) MSDS GCC1-7** 6

Material(s) known to the State of California to cause adverse reproductive effects: None
Massachusetts Substance List: None
New Jersey Workplace Hazardous Substance List: None
Pennsylvania Hazardous Substance List: None
This document has been prepared in accordance with the MSDS requirements of the WHMIS Controlled Products Regulation.
WHMIS (Canada) Ingredient Disclosure List: Listed
WHMIS9 (Canada) Status: Regulated
WHMIS (Canada) Hazard Classification: None
IARC - International Agency for Research on Cancer Carcinogenicity Classification (components present at 0.1% or more): Not Listed
ACGIH - American Conference of Governmental Industrial Hygienists: Not Listed
NTP - National Toxicology Program: Not listed
Reporting requirements of Section 313 or Title III of the superfund Amendments and Reauthorization Act (SARA) of 1986 and 40 CFR Part 372: None
SARA (U.S.A.) Sections 311 and 312 hazard classification(s): fire hazard
TSCA - US Toxic Substances Control Act: This product is listed on the TSCA inventory.
CEPA/DSL - Canadian Environmental Protection Act/ Domestic Substances List: Listed.
EINECS - European Inventory of Existing Commercial Chemical Substances: No. 200-664-3
AICS/NICNAS - Australian Inventory of Chemical Substances/National Industrial Chemical notification and Assessment Scheme: This product is listed on AICS.
Japanese Handbook of Existing and New Chemical Substances: Listed.
EC Classification and User Label Information (Council Directive 67/548/EEC and 1999/45/EC): Hazard Symbols and Risk Phrases – None Required
ICH (International Council on Harmonization): Class III – Solvent with low toxic potential

16. Other information

US/CANADIAN Label Statements:
WARNING!
COMBUSTIBLE LIQUID AND VAPOR
HIGH VAPOR CONCENTRATIONS MAY CAUSE DROWSINESS
Store away from heat and light.
Distill with caution.
Keep away from heat and flame.
Avoid breathing high vapor concentrations.
Keep container closed.
Use with adequate ventilation and proper protective equipment given elsewhere in this MSDS.
FIRST AID:
If inhaled, move to fresh air. Treat symptomatically. Get medical attention if symptoms persist.
IN CASE OF FIRE:
Eliminate all ignition sources. Flush spill area with water spray. Prevent runoff from entering drains, sewers, and streams.
Since emptied containers retain product residue, follow label warnings even after container is emptied.
CAUTION:
FOR MANUFACTURING, PROCESSING OR REPACKAGING BY TRAINED PERSONNEL

Disclaimer:

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Genomine, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose

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MATERIAL SAFETY DATA SHEET

1. Product and company identification

Product name	*Reactive Biotin*
Manufacturer/Supplier	*GENOMINE INC.* *VENTURE BLDG. 307 POHANG TECHNO PARK POHANG, KYUNGBUK, 790-834, KOREA.*
Application of the Substance / Preparation	*Refer to the instruction booklet for proper and intended use. Otherwise, contact supplier for specific applications.*
Information in case of emergency	*+82 - 54 - 223 - 2463*

2. Composition/information on ingredients

The following product(s) for which you requested a Material Safety Data Sheet (MSDS) are not defined as hazardous by OSHA 29 CFR 1910.1200 and an MSDS has not been developed.

Chemical Name	CAS number	%	Hazardous
Biotin-N-hydroxysuccinimide	35013-72-0	> 95 %	No

Synonyms : *d*-Biotin NHS ester, NHS-Biotin, BNHS, N-Succinimidyl D-biotinate, N-Hydroxysuccinimidobiotin, (+)-Biotin N-succinimidyl ester

Formula : C14H19N3O5S

3. Hazards identification

Even though the above listed product(s) are not defined as hazardous by the OSHA Hazard Communication Standard, all materials should be handled with appropriate caution and under

competent supervision. Always follow good manufacturing and laboratory practices. Protective gloves, safety glasses or goggles, lab coat and access to a safety shower and eyewash are recommended.

4. Other information

• For R&D use only. Not for drug, household, or other use.

Disclaimer:

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MATERIAL SAFETY DATA SHEET

1. Product and company identification

Product name	*Stop Solution*
Manufacturer/Supplier	*GENOMINE INC.* *VENTURE BLDG. 307 POHANG TECHNO PARK POHANG, KYUNGBUK, 790-834, KOREA.*
Application of the Substance / Preparation	*Refer to the instruction booklet for proper and intended use. Otherwise, contact supplier for specific applications.*
Information in case of emergency	*+82 - 54 - 223 - 2463*

2. Composition/information on ingredients

Chemical Name	CAS number	%	Hazardous
2-amino-2-(hydroxymethyl)-1,3-propanedion(TRIS)	77-86-1	18-20 %	Yes
Hydrochloric acid	7647-01-0	3-5 %	Yes

Substance/preparation : Preparation

There are no ingredients or additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

3. Hazards identification

Emergency Overview: Clear colorless liquid. Can cause irritation to eyes, skin, and upper respiratory system. Note: This product is formulated with hydrochloric acid but it is supplied in a pH neutral range.
Health Effects:

Inhalation: Mists can cause irritation to the upper respiratory system. Symptoms may include coughing and scratchy throat.
Skin: Can cause irritation. Symptoms may include redness, rash, and itching.
Eyes: Can cause eye irritation. Symptoms may include redness, tearing, and pain.
Ingestion: May cause nausea and discomfort.
Chronic Effects/Target Organ Effects: None known
Medical Conditions Aggravated By Exposure: None known

Environmental Effects: None known

4. First aid measures

Inhalation: Follow standard care for a respiratory emergency as necessary. Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.
Skin: Follow standard care for skin contact as needed. Immediately wash thoroughly with soap and water. Remove contaminated clothing and shoes. Get medical attention if symptoms develop. Wash clothing and shoes before reuse, or discard in a manner that limits further exposure.
Eye: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention immediately if irritation persists.
Ingestion: If swallowed, get medical attention immediately. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person..

5. Fire-fighting measures

Extinguishing Media: Dry chemical, fire-fighting foam, water spray, or carbon dioxide for surrounding materials.
Special Exposure Hazards: This product is water-based. Under fire conditions the organic residues remaining after the water evaporates are expected to burn generating toxic and irritating gases and smoke. Evacuate area and fight fire from safe distance.
Special Protective Equipment: Wear approved pressure-demand self-contained breathing apparatus and full protective gear.

6. Accidental release measures

Personal Precautions: Prevent skin/eye contact. Use personal protective equipment as needed. Isolate spill area, preventing entry by unauthorized persons.
Environmental Precautions: Minimize entry of material into sewers and drainage systems. Refer to permit discharge limitations if applicable.

Methods For Cleaning Up: Clean up spills immediately, observing precautions in the material safety data sheet and label.
Use absorbent materials if needed and dispose into a chemical waste container.

7. Handling and storage

Handling: Use with adequate ventilation as necessary or desired. Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Follow all MSDS/label precautions. Follow same precautions for packaging that may contain product residues. Avoid contact with skin and eyes.
Storage: Keep container tightly closed when not in use. Store at 18-24°C.
Specific Uses: For R&D/experimental use only

8. Exposure controls/personal protection

Exposure Limit Values: Hydrochloric acid: OSHA PEL-C: 5 ppm; ACGIH TLV-C: 2 ppm.
Exposure Controls: Use process enclosures, local exhaust ventilation, or other engineering controls as needed.
Respiratory Protection: Use an approved air-purifying respirator as needed. Consult with respirator manufacturer to determine respirator selection, use, and limitations.
Eye/Face Protection: Use safety glasses. Where contact with the eyes is likely, use chemical goggles.
Skin/Hand Protection: Use chemical gloves as needed. Use clean protective body covering clothing as needed to minimize contact with clothing and skin.

9. Physical and chemical properties

Appearance: …….. Clear or colorless aqueous solution
Odor: …… None
Flash Point: ……. Not available
Viscosity: …… Not available
Solubility: …… Miscible in water
Density (water = 1): .. 1.020
Partition Coefficient: . Not available
Boiling Point: …….. ~100°C
Melting Point: ……. Not available
pH: ……..…… 7~9
Other: ……. Not available

10. Stability and reactivity

Stability: Stable.
Conditions To Avoid: Avoid contact with strong oxidizers.

Materials To Avoid: Avoid contact with strong oxidizers.
Hazardous Decomposition Products: Oxides of carbon and nitrogen.

11. Toxicological information

Hydrochloric acid: Inhalation LC50: 3124 ppm/1H (rat); Oral LD50: 700 mg/kg (rat); Dermal LD50: >5010 mg/kg (rabbit) 2-Amino-2-(hydroxymethyl)-1,3-propanediol (TRIS): Oral LD50: 5,900 mg/kg (rat)

12. Ecological information

Ecotoxicity: Not available
Mobility: Not available
Persistence And Degradability: Not available
Bioaccumulative Potential: Not available

13. Disposal consideration

Dispose of unused product, residues, and containers according to local, regional, state, and national regulations.

14. Transport information

Not expected to be hazardous for transport

15. Regulatory information

US Regulations:
This product meets the following SARA 311/312 hazard categories: acute.
This product contains the following SARA 302 Extremely Hazardous Substances: none.
This product contains hydrochloric acid, a toxic chemical subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.
This product contains the following CERCLA Hazardous Substances: hydrochloric acid: 5,000 lbs.
Components of this product are listed on the TSCA inventory.

EU Regulations:
This preparation meets the following dangerous preparations classification criteria under 1999/45/EC:
Xi: R36/37/38: Irritating to eyes, respiratory system and skin.
The following safety phrases apply:
S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S36: Wear suitable protective clothing.

Canadian Regulations:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and it contains the information required by the CPR. This product meets WHMIS classification criteria D2B (note: this product is supplied in a neutral pH range). Components of this product are listed on the DSL.

16. Other information

NFPA/HMIS Ratings: Health = 2; Fire = 1; Reactivity = 0; NFPA/Special = None
Other Information:
R-phrases used in section 2, but not listed section 15:
R34: Causes burns.
R37: Irritating to respiratory system.
MSDS Revisions: May 2008: Rev. 2.0

Disclaimer:

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MATERIAL SAFETY DATA SHEET

1. Product and company identification

Product name	*Solution B*
Manufacturer/Supplier	*GENOMINE INC.* *VENTURE BLDG. 307 POHANG TECHNO PARK POHANG, KYUNGBUK, 790-834, KOREA.*
Application of the Substance / Preparation	*Refer to the instruction booklet for proper and intended use. Otherwise, contact supplier for specific applications.*
Information in case of emergency	*+82 - 54 - 223 - 2463*

2. Composition/information on ingredients

Chemical Name	CAS number	%	Hazardous
Proprietary component(S)	NA	40-60 %	Yes
Water	7732-18-5	> 60 %	No

Substance/preparation : Preparation

There are no ingredients or additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

3. Hazards identification

Emergency Overview

WHMIS Classification

Not WHMIS controlled. Not a dangerous substance according to GHS.

HMIS Classification

Health hazard: 1

Flammability: 0

Physical hazards: 0

Potential Health Effects

Inhalation May be harmful if inhaled. May cause respiratory tract irritation.

Skin May be harmful if absorbed through skin. May cause skin irritation.

Eyes May cause eye irritation.

Ingestion May be harmful if swallowed.

4. First aid measures

If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration.

In case of skin contact

Wash off with soap and plenty of water.

In case of eye contact

Flush eyes with water as a precaution.

If swallowed

Never give anything by mouth to an unconscious person. Rinse mouth with water.

5. Fire-fighting measures

Conditions of flammability

Not flammable or combustible.

Suitable extinguishing media

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Special protective equipment for fire-fighters

Wear self contained breathing apparatus for fire fighting if necessary.

Hazardous combustion products

Hazardous decomposition products formed under fire conditions. - nitrogen oxides (NOx), Sulphur oxides

Explosion data - sensitivity to mechanical impact

no data available

Explosion data - sensitivity to static discharge

no data available

6. Accidental release measures

Personal precautions
Avoid breathing vapors, mist or gas.
Environmental precautions
Do not let product enter drains.
Methods and materials for containment and cleaning up
Keep in suitable, closed containers for disposal.

7. Handling and storage

Precautions for safe handling
Normal measures for preventive fire protection.
Conditions for safe storage
Keep container tightly closed in a dry and well-ventilated place.
Recommended storage temperature: 2 - 8 °C

8. Exposure controls/personal protection

Contains no substances with occupational exposure limit values.
Personal protective equipment
Respiratory protection
Respiratory protection not required. For nuisance exposures use type OV/AG (US) or type ABEK (EU EN 14387) respirator cartridges. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).
Hand protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.
Eye protection
Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).
Skin and body protection
impervious clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.
Hygiene measures
General industrial hygiene practice.
Specific engineering controls
Use mechanical exhaust or laboratory fumehood to avoid exposure.

9. Physical and chemical properties

Appearance: Colorless liquid.
Odor: Slight odor of ammonia.
Specific Gravity: No information found.
pH: No data avaible
Boiling Point: No information found.
Melting Point: No information found.
Vapor Density (Air=1): Not applicable.
Vapor Pressure (mm Hg): Not applicable.
Evaporation Rate (BuAc=1): No information found.

10. Stability and reactivity

Chemical stability
Stable under recommended storage conditions.
Possibility of hazardous reactions
no data available
Conditions to avoid
no data available
Materials to avoid
Strong oxidizing agents

Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - nitrogen oxides (NOx), Sulphur oxides

11. Toxicological information

Acute toxicity
Oral LD50
Inhalation LC50
no data available
Dermal LD50
no data available
Other information on acute toxicity
no data available
Skin corrosion/irritation
no data available
Serious eye damage/eye irritation
Eyes: no data available
Respiratory or skin sensitization
no data available
Germ cell mutagenicity
no data available
Potential health effects
Inhalation May be harmful if inhaled. May cause respiratory tract irritation.

Ingestion May be harmful if swallowed.
Skin May be harmful if absorbed through skin. May cause skin irritation.
Eyes May cause eye irritation.
Signs and Symptoms of Exposure
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

12. Ecological information

Ecotoxicity: Not available
Mobility: Not available
Persistence And Degradability: Not available
Bioaccumulative Potential: Not available

13. Disposal consideration

Product
Offer surplus and non-recyclable solutions to a licensed disposal company.
Contaminated packaging
Dispose of as unused product.

14. Transport information

DOT (US)
Not dangerous goods
IMDG
Not dangerous goods
IATA
Not dangerous goods

15. Regulatory information

DSL Status
All components of this product are on the Canadian DSL list.
WHMIS Classification
Not WHMIS controlled. Not WHMIS controlled.
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

16. Other information

Disclaimer:

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