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The following MSDS included following products;

Cat. No	Product description
100-150	Hybrid-Q™ Plasmid Rapidprep [mini, 50preps]
100-102	Hybrid-Q™ Plasmid Rapidprep [mini, 200preps]
100-110	Hybrid-Q™ Plasmid Rapidprep samples [mini, 10preps]

MATERIAL SAFETY DATA SHEET

Product Name

Buffer S1

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product identifier

Product name Buffer S1

1.2 Relevant identified uses of the substance or mixture and uses advised against

Use of the substance or mixture Laboratory chemicals

1.3 Details of the supplier of the safety data sheet

Name GENEALL BIOTECHNOLOGY CO., LTD
 Address GeneAll Bldg., 303-7, Dongnam-ro, Songpa-gu, Seoul, 05729, Korea
 Information contact <+82-2-407-0096
 E-Mail (competent person) sales@geneall.com
 Emergency Telephone Number <+82-2-407-0096

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008 [CLP/GHS]

This product is NOT classified as regulated substance and NOT subject to label elements.

2.2 Label elements

Labelling according to Regulation (EC) No 1272/2008 [CLP/GHS]

Hazard pictograms No data available
 Signal word No data available
 Hazardous statements No data available
 Precautionary statements
 Prevention No data available
 Response No data available
 Storage No data available
 Disposal No data available

2.3 Other Non-GHS Classification

No data available

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance name	CAS No.	Concentration (%)
EDTA, DISODIUM DIHYDRATE	6381-92-6	0.01~0.05
TRIS	77-86-1	0.005~0.01

4. FIRST AID MEASURES

4.1 Description of first aid measures

General informations Notify doctor/physician about the substance to take necessary actions.
 Following eye contact Immediately flush the eyes with water for minutes. Remove contact lense, if possible. Keep washing. Get medical advice/attention, if symtom persists.
 Following skin contact If the material is hot, immerse or wash the affected area with a large amount of cold water to remove the heat. Get emergency medical attention. Remove contaminated clothing and footwear and isolate contaminated areas. In case of contact with substance, flush the skin immediately with water for at least 20 minutes. In case of minor skin contact, prevent the spread of contamination. If skin irritation occurs, take medical advice or attention. Remove contaminated clothing and wash before reusing.
 Following inhalation If exposed to excessive dust or fumes, remove them with clean air. Seek medical attention, if you experience coughing or other symptoms. Move to an area with fresh air. If breathing has stopped, perform artificial respiration. If breathing is difficult, provide oxygen. Keep the person warm and comfortable.

MATERIAL SAFETY DATA SHEET

Product Name	Buffer S1
Following ingestion	Get medical advice/attention.

5. FIRE FIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media

Use alcohol foam, carbon dioxide, or water spray.
Use dry sand or soil for smothering fires.

5.2 Special hazards arising from the substance or mixture

Specific hazards during firefighting

Highly toxic gases can be generated by pyrolysis or combustion during burning.
If heated, containers may explode.
Some may combust but does not ignite easily.
It's not flammability, but if heated, it may decompose to cause corrosive/toxic fumes.

5.3 Precautions for fire-fighters

Special protective equipment for firefighters

Wear appropriate protective apparatus.
Extinguish the fire from a safe distance away from the area.
Be aware that it may be transported in a melted form.
Be aware that some may be transported at high temperatures.
Dig a ditch for the disposal of the fire fighting water and keep the material from dispersing.
Move the containers from fire, if not dangerous.
In case of tank fire:
Extinguish it away from maximum distance or use unmanned fire extinguisher.
Keep cooling the container with a large amount of water even after the fire is out.
If there's a high pitched noise or change of color, keep away immediately.
Keep away from the tank covered in flames.
Use unmanned fire extinguishing equipment, and if it's unavailable, just let it burn.

5.4 Further information

No information available.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions

Clean spills and see section 5.3.
Remove all ignition sources.
If it's not dangerous, stop the leak.
Avoid contact without proper protective apparatus.
Cover with plastic sheet to prevent spread.
Avoid formation of dust.
Note the substances and conditions to avoid.
Avoid breathing dust/fume/gas/mist/vapours/spray

6.2 Environmental precautions

Environmental precautions

Avoid spread into waterway, sewers, drains, or confined areas.
Do not release to the environment.

6.3 Methods and material for containment and cleaning up

Method for cleaning up

Soak up with inert absorbent material(e.g. dry sand or soil), and place into the containers for chemical waste.
Absorb the liquid and wash off the contaminated area with detergent and water.
(large leaks) Make a ditch keeping distance from the leaks.
Use a clean shovel to place the spilled material into a clean, dry container. Loosely close the container and move it away from the spill area.
(powder leaks) Cover with plastic sheet to prevent spread and keep dry.
(small leaks) Absorb it with sand or an inert material and place it into a container.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

MATERIAL SAFETY DATA SHEET

Product Name	Buffer S1
Advice on safe handling	<p>Empty containers may retain product residue and can be hazardous. Follow all MSDS/label precautions.</p> <p>Carefully open the cap.</p> <p>Avoid prolonged or continuous skin contact.</p> <p>Be aware of the substances and conditions to avoid.</p> <p>See section 8 for exposure controls and protective equipment.</p> <p>Be cautious of high temperatures.</p> <p>Avoid breathing dust/fume/gas/mist/vapours/spray</p> <p>Wash the handling area thoroughly after work.</p> <p>Handle only outdoors or in a well-ventilated area.</p>

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage rooms and vessels	Completely drain empty drums and seal them properly before placing them. Store containers tightly sealed in a well-ventilated area.
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7.3 Specific end use(s)

Specific end use(s)	Laboratory chemicals.
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8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

KOSHA exposure limits	No data available
ACGIH exposure limits	No data available
Biological Exposure Indices (BEIs)	No data available

8.2 Exposure controls

If driving generates dust, fumes, or mist, ensure adequate ventilation to keep air pollution levels below exposure limits.

Install facilities for wash and shower to use the material.

8.3 Personal protective equipment

Respiratory protection	<p>Wear respiratory protective equipment certified by the Korea Occupational Safety and Health Agency that matches the physical and chemical properties of the particulate matter to which you are exposed.</p> <p>For particulate matter, the following respiratory protection is recommended:</p> <p>Filtering facepiece respirators or air-purifying respirators (with high-efficiency particulate filters) or powered air-purifying respirators (with filters for dust, mist, and fumes).</p> <p>If oxygen levels are insufficient (<19.6%), wear supplied-air respirators or self-contained breathing apparatus (SCBA).</p>
Suitable eye protection	<p>Wear protective goggles that are breathable to safeguard your eyes against particulate matter that may cause eye irritation or other health hazards.</p> <p>Install emergency washing facilities (shower-type) and eye wash stations in easily accessible locations for workers.</p>
Hand protection	Wear suitable protective gloves, considering physical and chemical properties of chemical substances.
Skin and body protection	Wear suitable protective clothing, considering physical and chemical properties of chemical substances.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Physical state	liquid
Color	colorless
Odor	No data available
Odour Threshold	No data available
pH	No data available
Melting point/freezing point	No data available
Boiling point/boiling range	No data available
Flash point	No data available
Evaporation rate	No data available
Flammability (solid, gas)	No data available

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Product Name	Buffer S1
Upper/lower flammability or explosive limits	No data available
Vapour pressure	No data available
Solubility (ies)	No data available
Vapour density	No data available
Specific gravity	No data available
Partial coefficient n-octanol/water	No data available
Auto-ignition temperature	No data available
Decomposition temperature	No data available
Viscosity	No data available
Molecular weight	No data available
EDTA	
Physical state	solid
Color	white
Odor	No data available
Odour Threshold	No data available
pH	5.3 (solution)
Melting point/freezing point	255 °C
Boiling point/boiling range	Not applicable
Flash point	No data available
Evaporation rate	No data available
Flammability (soild, gas)	No data available
Upper/lower flammability or explosive limits	No data available
Vapour pressure	Not applicable
Solubility (ies)	1000000 mg/l (estimated)
Vapour density	Not applicable
Specific gravity	No data available
Partial coefficient n-octanol/water	-10.70 (estimated)
Auto-ignition temperature	No data available
Decomposition temperature	252 °C
Viscosity	No data available
Molecular weight	372.14
TRIS	
Physical state	solid
Color	white
Odor	slightly unique odor
Odour Threshold	No data available
pH	10.4 (0.1 molar solution)
Melting point/freezing point	171 ~ 172 °C
Boiling point/boiling range	219 ~ 220 °C (at 10mmHg)
Flash point	170 °C
Evaporation rate	No data available
Flammability (soild, gas)	flammability
Upper/lower flammability or explosive limits	-/-
Vapour pressure	0.000002 mmHg (@ 25 °C, estimated)
Solubility (ies)	550000 mg/l (@ 25 °C)
Vapour density	4.18
Specific gravity	1.32 (@ 20.4 °C)
Partial coefficient n-octanol/water	-1.56 (estimated)
Auto-ignition temperature	No data available

MATERIAL SAFETY DATA SHEET

Product Name	Buffer S1
Decomposition temperature	No data available
Viscosity	No data available
Molecular weight	121.14

9.2 Other information

No data available

10. STABILITY AND REACTIVITY

10.1 Chemical stability and possibility of hazardous reactions

If heated, containers may explode.

Some may combust but does not ignite easily.

Non- flammable : this material does not burn but may evolve corrosive/toxic fumes when heated.

10.2 Conditions to avoid

Ignition sources such as heat, sparks, and flames

10.3 Materials to avoid

Flammable substances and reducing agents

10.4 Hazardous decomposition products

Highly toxic gases can be generated by pyrolysis or combustion during burning.

Corrosive/toxic fumes.

11. TOXICOLOGICAL INFORMATION

11.1 Routes of exposure

EDTA Irritation, nausea, vomiting, diarrhea.

TRIS No data available.

11.2 Information on toxicological effects

Acute toxicity

Oral

EDTA LD50 5900 mg/kg Rabbit

TRIS No data available.

Dermal

EDTA No data available.

TRIS No data available.

Inhalation

EDTA No data available.

TRIS No data available.

Skin corrosion/irritation

EDTA Slight irritation

TRIS Causes skin irritation.

Serious eye damage/eye irritation

EDTA Causes eye irritation.

TRIS Causes eye irritation.

Respiratory sensitisation

No data available.

Skin sensitisation

No data available.

Carcinogenicity

No data available.

Genotoxicity

No data available.

Reproductive toxicity

No data available.

MATERIAL SAFETY DATA SHEET

Product Name	Buffer S1
<u>Specific target organ toxicity - single exposure</u>	
EDTA	No data available.
TRIS	Irritates the respiratory tract upon inhalation.
<u>Specific target organ toxicity - repeated exposure</u>	
	No data available.
<u>Other harmful effects</u>	
	No data available.
12. ECOLOGICAL INFORMATION	
12.1 Toxicity	
<u>Toxicity to Fish</u>	
EDTA	No data available.
TRIS	LC50 955.892 mg/l 96 hr
<u>Toxicity to Crustacean</u>	
EDTA	No data available.
TRIS	EC50 19.793 mg/l 48 hr
<u>Toxicity to Algae</u>	
EDTA	No data available.
TRIS	EC50 163.053 mg/l 96 hr
12.2 Persistence and degradability	
<u>Persistence</u>	
EDTA	log Kow -10.70 (estimated)
TRIS	log Kow -1.56 (estimated)
<u>Degradability</u>	
	No data available
12.3 Bioaccumulative potential	
<u>Bioaccumulation</u>	
EDTA	BCF 3.16 (estimated)
TRIS	BCF 3
<u>Biodegradability</u>	
EDTA	Non-biodegradable - high potential for bioaccumulation due to lack of decomposition
TRIS	No data available
12.4 Mobility in soil	No data available
12.5 Other adverse effects	No data available
13. DISPOSAL CONSIDERATIONS	
13.1 Waste treatment methods	
Dispose of in accordance with all applicable environmental laws and regulations.	
13.2 Disposal considerations	
Dispose of in accordance with all applicable environmental laws and regulations.	
14. TRANSPORT INFORMATION	
14.1 UN number	
	This product is NOT categorized under UN number
14.2 UN Proper shipping name	
	Not applicable
14.3 Transport hazard class(es)	
	Not applicable
14.4 Packing group	
	Not applicable
14.5 Environmental hazards	
	No data available
14.6 Special precautions for user	
	Not applicable

MATERIAL SAFETY DATA SHEET

Product Name

Buffer S1

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

15. REGULATORY INFORMATION

15.1 Industrial Safety and Health Act

No data available

15.2 Toxic Chemicals Control Act

No data available

15.3 Safety Control of Dangerous Substances Act

No data available

15.4 Wastes Control Act

EDTA

Designated waste

TRIS

No data available

15.5 Other requirements in domestic and other countries

Not applicable

16. OTHER INFORMATION

Issued date

2016-10-28

Revision number

2

Revision date

2023-05-11

Reference

EPISUITE

HSNO CCID

HSDB

ECHA

National Library of Medicine/Hazardous Substances Data Bank(NLM/HSDB)(<http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB>)

The Chemical Database, The Department of Chemistry at the University of Akron(<http://ull.chemistry.uakron.edu/erd>)

ChemIDplus

Corporate Solution From Thomson Micromedex(<http://csi.micromedex.com>)

Ecological Structure Activity Relationships(ECOSAR)

Akron University(<http://ull.chemistry.uakron.edu/erd/>)

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- END OF SAFETY DATA SHEET-

MATERIAL SAFETY DATA SHEET

Product Name

Buffer S2

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product identifier

Product name Buffer S2

1.2 Relevant identified uses of the substance or mixture and uses advised against

Use of the substance or mixture Laboratory chemicals

1.3 Details of the supplier of the safety data sheet

Name GENEALL BIOTECHNOLOGY CO., LTD
 Address GeneAll Bldg., 303-7, Dongnam-ro, Songpa-gu, Seoul, 05729, Korea
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 E-Mail (competent person) sales@geneall.com
 Emergency Telephone Number <+82-2-407-0096

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008 [CLP/GHS]

Metal corrosive substances Category 1
 Acute oral toxicity Category 4
 Acute transdermal toxicity Category 4

2.2 Label elements

Labelling according to Regulation (EC) No 1272/2008 [CLP/GHS]

Hazard pictograms



Signal word

Warning

Hazardous statements

H290 May be corrosive to metal.
 H302 Harmful if swallowed.
 H312 Harmful if contacted.

Precautionary statements

Prevention

P234 Store only in original container.
 P264 Wash skin/hands thoroughly after handling.
 P270 Do not eat, drink or smoke when using this product.
 P280 Wear protective gloves/clothing/eye protection/face protection.

Response

P301+P312 IF SWALLOWED: Consult with doctor if you feel unwell.
 P302+P352 IF ON SKIN: Wash with plenty of soap and water.
 P312 – Consult with doctor if you feel unwell.
 P330 – Rinse mouth.
 P362+P364 Take off contaminated clothing and wash before reuse.
 P390 Absorb spillage to prevent material damage.

Storage

P406 Store in a corrosion-resistant container.

Disposal

P501 Dispose containers in accordance with all applicable environmental laws and regulations.

2.3 Other Non-GHS Classification

No data available

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance name	CAS No.	Concentration (%)
Sodium Hydroxide	1310-73-2	0.1~1
Sodium Docecyl Sulfate	151-21-3	0.1~1

4. FIRST AID MEASURES

4.1 Description of first aid measures

General informations Notify doctor/physician about the substance to take necessary actions.

MATERIAL SAFETY DATA SHEET

Product Name	Buffer S2
Following eye contact	Get an immediate medical treatment. Upon contact with the substance, immediately wash the skin and eyes with running water for at least 20 minutes. Rinse cautiously with water for minutes. Remove contact lenses, if possible. Keep washing.
Following skin contact	If the substance is hot, immerse or rinse the affected area in a large amount of cold water to remove the heat. Get an immediate medical treatment. Take off all contaminated clothing and shoes and isolate the areas. Upon contact with the substance, immediately wash the skin and eyes with running water for at least 20 minutes. Prevent the spread of contamination in case of minor skin contact. If you experience discomfort, seek medical attention from a healthcare provider. Remove or take off all contaminated clothing. Take off contaminated clothing and wash before reuse.
Following inhalation	Move to an area with fresh air. Do not perform resuscitation; use appropriate respiratory medical equipment instead. Keep warm and comfortable. Get an immediate medical treatment.
Following ingestion	Do not perform resuscitation; use appropriate respiratory medical equipment instead. If swallowed, seek medical attention immediately. Consult with doctor, if you feel unwell. Rinse the mouth Do not induce vomiting.

5. FIRE FIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media alcohol foam / carbon dioxide / water spray
dry sand or soil

5.2 Special hazards arising from the substance or mixture

Specific hazards during firefighting During burning, irritating and highly toxic gases may be generated by thermal decomposition or combustion.
If heated, containers may explode.
Some may burn but do not ignite easily.
Some may generate flammable hydrogen gas on contact with metals.
It's not flammability, but if heated, it may decompose to cause corrosive/toxic fumes.
Some are oxidizing agents and may ignite combustible materials.
Toxicity: Can cause serious injury or death if inhaled, ingested, or contacted with skin.
Contact with molten material can cause severe burns to skin and eyes.
Can produce irritant, corrosive, and toxic gases in case of fire.
May corrode metals.

5.3 Precautions for fire-fighters

Special protective equipment for firefighters Rescuers must wear appropriate protective equipment.
Extinguish the fire from the distance for safety.
Dig a ditch for the disposal of the fire fighting water and keep the material from dispersing.
Move containers from fire area if it's not dangerous.
In case of tank fire:
Extinguish it from the maximum distance or use fire extinguishing equipment.
Do not allow water to enter into the container.
Cool the container with plenty of water even after the fire is extinguished.
If there's a high-pitched sound or the tank changes color, leave immediately.
Keep away from the tank covered in flames.
In the case of large-scale fire, use unmanned firefighting equipment and if that's not possible, retreat and let it burn.

5.4 Further information

No information available.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions Wipe up spills immediately and follow section 8.
Eliminate all ignition sources. Prevent leak if it's not dangerous.
Do not touch broken containers or spills without appropriate protective clothing.
Do not allow water to enter into the container.
Cover with plastic sheet to prevent spread.
Be aware of substances and conditions to avoid.

6.2 Environmental precautions

Environmental precautions Spillage is corrosive/toxic and may cause contamination.
Prevent entry into waterways, drains, basements and confined spaces.

6.3 Methods and material for containment and cleaning up

MATERIAL SAFETY DATA SHEET

Product Name	Buffer S2
Method for cleaning up	Absorb spill with inert material (e.g. dry sand or earth) and place in chemical waste container. Absorb liquid and flush contaminated area with detergent and water. Absorb spillage to prevent material damage.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Advice on safe handling

Use only in well-ventilated areas. Follow all MSDS/label precautions.
Use with caution and pay attention to handling and storage.
Carefully open the cap.
Avoid long-term or continuous skin contact.
Do not breathe vapors from heated material.
Do not inhale vapors generated from heated substances.
Do not enter the storage area without proper ventilation.
Be aware of substances and conditions to avoid.
Work with reference to section 8.
Be careful of high temperatures.
Wash thoroughly after handling.
Do not eat, drink or smoke when using this product.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage rooms and vessels

Completely drain empty drums, seal them properly, and return them to the drum controller or place them appropriately.
Keep away from food and beverages.
Be aware of substances and conditions to avoid.
Store only in the original container.
Store in a locked storage area.
Since it is a corrosive material, store in corrosion-resistant containers.

7.3 Specific end use(s)

Specific end use(s)

Laboratory chemicals.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

KOSHA exposure limits

Sodium Hydroxide

STEL - C 2mg/m³

Sodium Docecyl Sulfate

No data available

ACGIH exposure limits

Sodium Hydroxide

TWA

STEL C 2 mg/m³

ETC

Sodium Docecyl Sulfate

No data available

Biological Exposure Indices (BEIs)

No data available

8.2 Exposure controls

Implement process isolation, use local exhaust ventilation, or apply other engineering controls to maintain air levels below exposure limits.
Install facilities for wash and shower to use the material.

8.3 Personal protective equipment

Respiratory protection

MATERIAL SAFETY DATA SHEET

Product Name	Buffer S2
Sodium Hydroxide	<p>Wear respiratory protective equipment certified by the Korea Occupational Safety and Health Agency that is suitable for the physical and chemical properties of the particulate matter to which you are exposed.</p> <p>If the exposure concentration is below 20 mg/m³, wear a half-mask respirator equipped with an appropriate filter. If the exposure concentration is below 50 mg/m³, wear a loose-fitting powered air-purifying respirator or a continuous-flow dust mask equipped with an appropriate filter. If the exposure concentration is below 100 mg/m³, wear a full-face or powered half-mask respirator, or an air-supplied continuous-flow/pressure-demand half-mask respirator equipped with an appropriate filter. If the exposure concentration is below 2000 mg/m³, wear a full-face or helmet/hood type, pressure-demand supplied air mask equipped with an appropriate filter. If the exposure concentration is below 20000 mg/m³, wear a self-contained breathing apparatus (SCBA) or a pressure-demand self-contained breathing apparatus (SCBA) equipped with an appropriate filter.</p>
Sodium Dodecyl Sulfate	<p>Wear respiratory protective equipment certified by the Korea Occupational Safety and Health Agency that matches the physical and chemical properties of the particulate matter to which you are exposed. For particulate matter, the following respiratory protection is recommended:</p> <p>Filtering facepiece respirators or air-purifying respirators (with high-efficiency particulate filters) or powered air-purifying respirators (with filters for dust, mist, and fumes). If oxygen levels are insufficient (<19.6%), wear supplied-air respirators or self-contained breathing apparatus (SCBA).</p>
Suitable eye protection	<p>Wear breathable safety glasses to protect your eyes from particulate matter that may cause eye irritation or other health hazards. Install emergency washing facilities in a location that is easily accessible to workers.</p>
Hand protection	Wear suitable gloves, considering physical/chemical properties of substance.
Skin and body protection	Wear suitable clothes, considering physical/chemical properties of substance.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Physical state	liquid
Color	colorless
Odor	No data available
Odour Threshold	No data available
pH	No data available
Melting point/freezing point	No data available
Boiling point/boiling range	No data available
Flash point	No data available
Evaporation rate	No data available
Flammability (solid, gas)	No data available
Upper/lower flammability or explosive limits	No data available
Vapour pressure	No data available
Solubility (ies)	No data available
Vapour density	No data available
Specific gravity	No data available
Partial coefficient n-octanol/water	No data available
Auto-ignition temperature	No data available
Decomposition temperature	No data available
Viscosity	No data available
Molecular weight	No data available
Sodium Hydroxide	
Physical state	solid

MATERIAL SAFETY DATA SHEET

Product Name	Buffer S2
Color	white
Odor	Odorless
Odour Threshold	No data available
pH	(0.05% solution 12; 0.5% solution 13; 5% solution 14 (2))
Melting point/freezing point	318 °C
Boiling point/boiling range	1390 °C
Flash point	Not applicable
Evaporation rate	No data available
Flammability (solid, gas)	Non-flammable (1)
Upper/lower flammability or explosive limits	- / -
Vapour pressure	< 0.001 kPa
Solubility (ies)	109 g/100mℓ (20°C)
Vapour density	No data available
Specific gravity	2.1
Partial coefficient n-octanol/water	-3.88 (Estimate)
Auto-ignition temperature	No data available
Decomposition temperature	No data available
Viscosity	No data available
Molecular weight	40
Sodium Docecyl Sulfate	
Physical state	solid
Color	white
Odor	slight odor
Odour Threshold	No data available
pH	Not applicable
Melting point/freezing point	204 ~ 207 °C
Boiling point/boiling range	Not applicable
Flash point	No data available
Evaporation rate	No data available
Flammability (solid, gas)	No data available
Upper/lower flammability or explosive limits	- / -
Vapour pressure	0.0000000000047 mmHg (at 25 °C(estimated))
Solubility (ies)	(10%)
Vapour density	Not applicable
Specific gravity	(>1.1 (water=1))
Partial coefficient n-octanol/water	1.6
Auto-ignition temperature	No data available
Decomposition temperature	No data available
Viscosity	No data available
Molecular weight	288.38

9.2 Other information

No data available

10. STABILITY AND REACTIVITY

10.1 Chemical stability and possibility of hazardous reactions

MATERIAL SAFETY DATA SHEET

Product Name	Buffer S2
Sodium Hydroxide	<p>May corrode metals. Containers may explode when heated. Some may generate flammable hydrogen gas on contact with metals. Non-flammable, the material itself does not burn, but may decompose when heated, generating corrosive/toxic fumes. Some are oxidizing agents and may ignite combustible materials. Toxic: May cause serious injury or death by inhalation, ingestion or skin contact. Contact with molten material may cause serious burns to skin and eyes. In case of fire, irritating, corrosive and toxic gases may be generated.</p>
Sodium Docecyl Sulfate	<p>Containers may explode when heated. Some may burn but do not ignite easily. Non-flammable, the material itself does not burn, but may decompose when heated, generating corrosive/toxic fumes. In case of fire, irritating, corrosive and toxic gases may be generated.</p>
ETHYLENEDIAMINETETRAACETIC ACID	<p>Containers may explode when heated. Some may burn but do not ignite easily. Non-flammable, the material itself does not burn, but may decompose when heated, generating corrosive/toxic fumes. In case of fire, irritating, corrosive and toxic gases may be generated.</p>

10.2 Conditions to avoid

Sodium Hydroxide	heat
Sodium Docecyl Sulfate	ignition sources such as heat, sparks, and flames

10.3 Materials to avoid

Sodium Hydroxide	metal, combustible substances, reducible substances
Sodium Docecyl Sulfate	combustible substances, reducible substances

10.4 Hazardous decomposition products

Sodium Hydroxide	Hazardous decomposition products formed under fire conditions. - Carbon oxides corrosive and toxic fume
Sodium Docecyl Sulfate	irritating, corrosive and toxic gas

11. TOXICOLOGICAL INFORMATION

11.1 Routes of exposure

Sodium Hydroxide	Inhalation of mist, contact with eyes, and skin
Sodium Docecyl Sulfate	Irritation, vomiting; skin irritation, skin disorders, eye irritation.

11.2 Information on toxicological effects

Acute toxicity

Oral

Sodium Hydroxide	LD50 325 mg/kg Rabbit
Sodium Docecyl Sulfate	LD50 1200 mg/kg Rat

Dermal

Sodium Hydroxide	No data available.
Sodium Docecyl Sulfate	LD50 600 mg/kg Rabbit

Inhalation

No data available.

Skin corrosion/irritation

Sodium Hydroxide

Skin corrosion/irritation test results using rabbits show irritation observed (OECD Guideline 404). Causes severe corrosion in humans and severe necrosis on rabbit skin. Highly alkaline and classified as a corrosive substance.

Sodium Docecyl Sulfate

250 mg / 24 hr skin - human slight irritation

Serious eye damage/eye irritation

Sodium Hydroxide

The results of severe eye damage/irritation testing using rabbits showed significant conjunctival irritation, according to OECD Guideline 405

MATERIAL SAFETY DATA SHEET

Product Name	Buffer S2
Sodium Docecyl Sulfate	10 mg / 24 hr eyes - rabbit moderate irritation
<u>Respiratory sensitisation</u>	No data available.
<u>Skin sensitisation</u>	
Sodium Hydroxide	There was no skin sensitization observed in the skin sensitization test on humans.
Sodium Docecyl Sulfate	No data available.
<u>Carcinogenicity</u>	No data available.
<u>Genotoxicity</u>	
Sodium Hydroxide	The results of the in vitro bacterial reverse mutation test showed negative results regardless of the presence of metabolic activation. The Ames test using <i>S. typhimurium</i> also yielded negative results under both conditions. In the chromosome aberration test using CHO cells, positive results were observed with metabolic activation and negative results without it, likely due to the formation of chromosomal aberrations from S9 products. Additionally, the in vivo micronucleus test using mouse bone marrow cells showed negative results.
Sodium Docecyl Sulfate	Reverse mutation test: negative Sister chromatid exchange test: negative Micronucleus test: negative
<u>Reproductive toxicity</u>	
Sodium Hydroxide	No data available.
Sodium Docecyl Sulfate	NOAEL 300 mg/kg/day (maternal toxicity) NOAEL = 400 mg/kg/day (resorption/litter loss) NOAEL =600 mg/kg/day
<u>Specific target organ toxicity - single exposure</u>	
Sodium Hydroxide	It irritates the respiratory system and airways, causing pulmonary edema. In a study of 25-year-old women working for a day in a poorly ventilated room while inhaling a 5% NaOH aerosol, irreversible obstructive lung damage was observed, although the evidence was insufficient.
Sodium Docecyl Sulfate	No data available.
<u>Specific target organ toxicity - repeated exposure</u>	
Sodium Hydroxide	No data available.
Sodium Docecyl Sulfate	NOAEL 100 mg/kg/day, liver toxicity
<u>Other harmful effects</u>	No data available.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to Fish

Sodium Hydroxide	LC50 125 mg/l 96 hr (<i>Gambusia affinis</i>)
Sodium Docecyl Sulfate	LC50 1.31 mg/l 96 hr <i>Cyprinus carpio</i>

Toxicity to Crustacean

Sodium Hydroxide	EC50 40.4 mg/l 48 hr (<i>Ceriodaphnia dubia</i>)
Sodium Docecyl Sulfate	EC50 6 mg/l 48 hr <i>Daphnia magna</i>

Toxicity to Algae

Sodium Hydroxide	No data available.
Sodium Docecyl Sulfate	EC50 1.2 mg/l 96 hr <i>Skeletonema costatum</i>

12.2 Persistence and degradability

Persistence

Sodium Hydroxide	log Kow -3.88 (Estimate)
Sodium Docecyl Sulfate	log Kow 1.60

Degradability

No data available

12.3 Bioaccumulative potential

Bioaccumulation

MATERIAL SAFETY DATA SHEET

Product Name	Buffer S2
Sodium Hydroxide	Not expected to bioaccumulate due to high solubility
Sodium Docecyl Sulfate	BCF 2.1 ~ 7.1
Biodegradability	
Sodium Hydroxide	Not applicable
Sodium Docecyl Sulfate	100 (%) 28 day
12.4 Mobility in soil	No data available
12.5 Other adverse effects	No data available
13. DISPOSAL CONSIDERATIONS	
13.1 Waste treatment methods	
Sodium Hydroxide	1) Treat by neutralization, hydrolysis, oxidation, or reduction. 2) Incinerate at high temperatures or process through high-temperature melting. 3) Solidify the material.
Sodium Docecyl Sulfate	pre-treat using oil-water separation methods, if available.
13.2 Disposal considerations	
Dispose of in accordance with all applicable environmental laws and regulations.	
14. TRANSPORT INFORMATION	
14.1 UN number	
Sodium Hydroxide	1823
Sodium Docecyl Sulfate	Not classified as dangerous good
14.2 UN Proper shipping name	
Sodium Hydroxide	SODIUM HYDROXIDE, SOLID
Sodium Docecyl Sulfate	Not applicable
14.3 Transport hazard class(es)	
Sodium Hydroxide	8
Sodium Docecyl Sulfate	Not applicable
14.4 Packing group	
Sodium Hydroxide	II
Sodium Docecyl Sulfate	Not applicable
14.5 Environmental hazards	
Sodium Hydroxide	Not applicable
Sodium Docecyl Sulfate	No data available
14.6 Special precautions for user	
Sodium Hydroxide	F-A
Sodium Docecyl Sulfate	Not applicable
14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	
Not applicable for product as supplied.	
15. REGULATORY INFORMATION	
15.1 Industrial Safety and Health Act	
Sodium Hydroxide	hazardous substances (monitoring cycle: every 6 months)
Sodium Docecyl Sulfate	No data available
15.2 Toxic Chemicals Control Act	
Sodium Hydroxide	Toxic substance
Sodium Docecyl Sulfate	No data available
15.3 Safety Control of Dangerous Substances Act	
No data available	
15.4 Wastes Control Act	
Designated waste	
15.5 Other requirements in domestic and other countries	

MATERIAL SAFETY DATA SHEET

Product Name

Buffer S2

In accordance with international laws and regulations of country.

16. OTHER INFORMATION

Issued date

2016-10-31

Revision number

2

Revision date

2023-05-22

Reference

ICSC

SIDS

NCIS

ECHA

NLM

SRC

ECOTOX

OECD SIDS

IUCLID

EPISUITE

HSNO CCID

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- END OF SAFETY DATA SHEET-

MATERIAL SAFETY DATA SHEET

Product Name

Buffer G3

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product identifier

Product name Buffer G3

1.2 Relevant identified uses of the substance or mixture and uses advised against

Use of the substance or mixture Laboratory chemicals

1.3 Details of the supplier of the safety data sheet

Name GENEALL BIOTECHNOLOGY CO., LTD
 Address GeneAll Bldg., 303-7, Dongnam-ro, Songpa-gu, Seoul, 05729, Korea
 Information contact <+82-2-407-0096
 E-Mail (competent person) sales@geneall.com
 Emergency Telephone Number <+82-2-407-0096

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008 [CLP/GHS]

Acute oral toxicity Category 4
 Skin corrosion/irritation Category 1
 Serious eye damage/eye irritation Category 1
 Specific Target Organ toxicity (single exposure) Category 3 (Respiratory Irritation)

2.2 Label elements

Labelling according to Regulation (EC) No 1272/2008 [CLP/GHS]

Hazard pictograms



Signal word

Danger

Hazardous statements

H302: Harmful if swallowed.
 H314: Causes severe skin burns and eye damage.
 H318: Causes serious eye damage.
 H335: May cause respiratory irritation.

Precautionary statements

P280: Wear protective gloves/protective clothing/eye protection/face protection.
 P261: Avoid breathing dust/fume/gas/mist/vapors/spray.
 P271: Use only outdoors or in a well-ventilated area.

Prevention

Response

P301+P330+P331: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
 P303+P361+P353: IF ON SKIN (or hair): Remove immediately all contaminated clothing. Rinse skin with water/shower.
 P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
 P304+P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.

Storage

P405: Store locked up.
 P403+P233: Store in a well-ventilated place. Keep container tightly closed.

Disposal

P501 Dispose containers in accordance with all applicable environmental laws and regulations.

2.3 Other Non-GHS Classification

No data available

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance name	CAS No.	Concentration (%)
Guanidinium chloride	50-01-1	40 - 45
Acetic acid	64-19-7	15 - 20

4. FIRST AID MEASURES

4.1 Description of first aid measures

MATERIAL SAFETY DATA SHEET

Product Name	Buffer G3
General informations	Symptoms may be delayed after contact or inhalation. Notify doctor/physician about the substance to take necessary actions.
Following eye contact	Rinse cautiously with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing and seek immediate medical attention.
Following skin contact	Immediately remove contaminated clothing. Rinse skin with water/shower. Seek medical attention if irritation or burns develop.
Following inhalation	Move to fresh air. Keep at rest in a position comfortable for breathing. Seek medical attention if symptoms persist.
Following ingestion	Rinse mouth. Do NOT induce vomiting. Seek immediate medical attention.
5. FIRE FIGHTING MEASURES	
5.1 Extinguishing media	
Suitable extinguishing media	Use water spray, alcohol-resistant foam, dry chemical, or carbon dioxide.
5.2 Special hazards arising from the substance or mixture	
Specific hazards during firefighting	Releases toxic fumes under fire conditions (carbon oxides, nitrogen oxides).
5.3 Precautions for fire-fighters	
	Wear self-contained breathing apparatus and full protective gear. Wear self-contained breathing apparatus and full protective clothing. Cool containers with water spray if safe to do so. Prevent firefighting water from entering drains or watercourses.
5.4 Further information	
No data available	
6. ACCIDENTAL RELEASE MEASURES	
6.1 Personal precautions, protective equipment and emergency procedures	
Personal precautions	Avoid contact with skin, eyes and clothing. Avoid breathing mist or vapours. Ensure adequate ventilation. Wear appropriate personal protective equipment (see section 8). Keep unprotected persons away from the spill area.
6.2 Environmental precautions	
Environmental precautions	Leaks may cause contamination. Avoid spread into waterway, sewers, drains, or confined areas. Do not release to the environment.
6.3 Methods and material for containment and cleaning up	
Method for cleaning up	Absorb spill with inert absorbent material (e.g. vermiculite, dry sand) and place in suitable waste containers. Wash contaminated surface with plenty of water after material pick-up is complete. Prevent run-off from entering drains or watercourses.
7. HANDLING AND STORAGE	
7.1 Precautions for safe handling	

MATERIAL SAFETY DATA SHEET

Product Name	Buffer G3
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Advice on safe handling

Avoid contact with skin and eyes.
Do not breathe mist or vapours. Use only in a well-ventilated area.
Wear appropriate personal protective equipment.
Wash hands thoroughly after handling.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage rooms and vessels

Keep container tightly closed in a cool, well-ventilated place.
Store away from strong bases, oxidizing agents and reactive metals.
Keep only in the original container.

7.3 Specific end use(s)

Specific end use(s) Laboratory chemicals.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

ACGIH exposure limits

Acetic Acid 10 ppm TWA; 15 ppm STEL

Biological Exposure Indices (BEIs)

Guanidinium chloride No data available

8.2 Exposure controls

Use appropriate engineering controls such as local exhaust ventilation to maintain airborne concentrations below recommended exposure limits.
Provide eyewash stations and safety showers in the work area.

8.3 Personal protective equipment

Respiratory protection

Eye/face protection: Safety goggles with side shields.
Skin protection: Chemical-resistant gloves and protective clothing.
Respiratory protection: Use a NIOSH-approved respirator if ventilation is inadequate or exposure limits are exceeded.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Physical state	Liquid
Color	Colorlessness
Odor	Odorless
Odour Threshold	No data available
pH	No data available
Melting point/freezing point	No data available
Boiling point/boiling range	No data available
Flash point	No data available
Evaporation rate	No data available
Flammability (soild, gas)	No data available
Upper/lower flammability or explosive limits	No data available
Vapour pressure	No data available
Solubility (ies)	No data available
Vapour density	No data available
Specific gravity	No data available
Partial coefficient n-octanol/water	No data available
Auto-ignition temperature	No data available
Decomposition temperature	No data available
Viscosity	No data available
Molecular weight	No data available

9.2 Other information

No data available

MATERIAL SAFETY DATA SHEET

Product Name

Buffer G3

10. STABILITY AND REACTIVITY

10.1 Chemical stability and possibility of hazardous reactions

The product is stable under recommended storage conditions.
Non-flammable aqueous solution.
Thermal decomposition may produce toxic and corrosive fumes (e.g. nitrogen oxides, acetic acid vapours).

10.2 Conditions to avoid

High temperatures. Avoid contact with incompatible materials.

10.3 Materials to avoid

Strong bases, strong oxidizing agents, reactive metals.

10.4 Hazardous decomposition products

Nitrogen oxides, acetic acid vapours and other irritating or corrosive gases may be released in case of fire.

11. TOXICOLOGICAL INFORMATION

11.1 Routes of exposure

May cause burns to the mouth, throat and stomach if swallowed.
Causes severe skin and eye irritation or burns.
Inhalation of mists may cause irritation of the respiratory tract, coughing and shortness of breath.

11.2 Information on toxicological effects

Acute toxicity

Oral

May be harmful if swallowed.

Dermal

Based on available data, the mixture is not classified for acute dermal toxicity; however, contact may cause severe skin irritation or burns.

Inhalation

Mist or vapour may cause respiratory tract irritation (STOT SE 3).

Skin corrosion/irritation

Causes severe skin irritation and chemical burns due to the presence of guanidinium chloride and acetic acid.

Serious eye damage/eye irritation

Causes serious eye damage. Exposure may result in severe irritation, corneal injury, or permanent eye damage.

Respiratory sensitisation

Not expected to be a respiratory sensitiser based on available component information.

Skin sensitisation

Component data (guanidinium chloride) indicates negative sensitisation results.

Germ cell mutagenicity

Component guanidinium chloride has shown negative results in standard genotoxicity tests.

Carcinogenicity

None of the mixture components are listed as carcinogens by IARC, NTP, or OSHA.

Reproductive toxicity

Not expected to cause reproductive toxicity based on available component information.

Specific target organ toxicity - single exposure

Inhalation of mist or aerosol may cause coughing, sore throat, and respiratory tract irritation.

Specific target organ toxicity - repeated exposure

Not classified due to insufficient evidence.

Aspiration hazard

Not expected to present an aspiration hazard based on physicochemical properties (aqueous mixture, low viscosity).

Other harmful effects

No other adverse effects known for the mixture.

Exposure may cause symptoms consistent with corrosive materials: burning sensation, coughing, difficulty breathing, and gastrointestinal distress if ingested.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

May be harmful to aquatic organisms if released in significant quantities.

Acetic acid is known to be toxic to aquatic life at high concentrations.

Guanidinium chloride shows moderate aquatic toxicity in fish studies

12.2 Persistence and degradability

No data available for the mixture.

Acetic acid is readily biodegradable.

Guanidinium chloride shows limited available data, and persistence cannot be fully assessed.

MATERIAL SAFETY DATA SHEET

Product Name

Buffer G3

12.3 Bioaccumulative potential

No data available for the mixture.

Acetic acid is not expected to bioaccumulate (low log Kow).

Guanidinium chloride is not expected to significantly bioaccumulate based on available information.

12.4 Mobility in soil

No data available for the mixture.

Due to its high water solubility, the mixture is expected to have high mobility in soil and may migrate in aqueous environments.

No known significant environmental hazards.

12.5 Other adverse effects

Avoid uncontrolled release to the environment.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Neutralise the solution with a suitable alkaline material, if appropriate, and dilute with plenty of water.

Dispose of contents and container through a licensed waste disposal contractor in accordance with local/regional/national regulations.

Do not discharge into drains or the environment without proper treatment.

13.2 Disposal considerations

Dispose of in accordance with all applicable environmental laws and regulations.

14. TRANSPORT INFORMATION

14.1 UN number

This product is NOT categorized under UN number

14.2 UN Proper shipping name

Not applicable

14.3 Transport hazard class(es)

Not applicable

14.4 Packing group

Not applicable

14.5 Environmental hazards

Not classified as environmentally hazardous for transport.

14.6 Special precautions for user

Avoid contact with skin and eyes. Prevent release into waterways. Use protective equipment during handling and spill response.

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

15. REGULATORY INFORMATION

15.1 Industrial Safety and Health Act

Relevant exposure standards apply (ACGIH or KOSHA exposure limits)

15.2 Toxic Chemicals Control Act

This mixture does not contain substances regulated under the Toxic Chemicals Control Act.

15.3 Safety Control of Dangerous Substances Act

Not applicable

15.4 Wastes Control Act

Dispose of contents/container in accordance with local waste regulations.
Neutralization may be required before disposal.

15.5 Other requirements in domestic and other countries

The components of this product are listed or exempted on major chemical inventories (e.g., TSCA, REACH, DSL/NDSL).

16. OTHER INFORMATION

Issued date

2021-02-12

Revision number

2

Revision date

2025-12-05

Reference

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This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- END OF SAFETY DATA SHEET-

MATERIAL SAFETY DATA SHEET

Product Name

Buffer AW

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product identifier

Product name Buffer AW

1.2 Relevant identified uses of the substance or mixture and uses advised against

Use of the substance or mixture Laboratory chemicals

1.3 Details of the supplier of the safety data sheet

Name GENEALL BIOTECHNOLOGY CO., LTD
 Address GeneAll Bldg., 303-7, Dongnam-ro, Songpa-gu, Seoul, 05729, Korea
 Information contact <+82-2-407-0096
 E-Mail (competent person) sales@geneall.com
 Emergency Telephone Number <+82-2-407-0096

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008 [CLP/GHS]

Skin corrosion/irritation Category 2
 Serious eye damage/eye irritation Category 2

2.2 Label elements

Labelling according to Regulation (EC) No 1272/2008 [CLP/GHS]

Hazard pictograms



Signal word

Warning

Hazardous statements

H315 Causes skin irritation.
 H319 Causes serious eye irritation.

Precautionary statements

Prevention

P264 Wash skin/hands thoroughly after handling.
 P280 Wear protective gloves/protective clothing/eye protection/face protection.

Response

P302+P352 IF ON SKIN: Wash with soap and water.
 P305+P351+P338 IF IN EYES: Rinse with water attentively for several minutes.
 Remove contact lenses, if possible. Keep washing.
 P362 Take off contaminated clothing and wash before reuse.

Storage

No data available

Disposal

No data available

2.3 Other Non-GHS Classification

Health=0, Flammability=0, Reactivity=0

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance name	CAS No.	Concentration (%)
Guanidinium chloride	50-01-01	55~65

MATERIAL SAFETY DATA SHEET

Product Name

Buffer AW

4. FIRST AID MEASURES

4.1 Description of first aid measures

General informations	Notify doctor/physician about the substance to take necessary actions.
Following eye contact	Immediately flush the eyes with water for at least 15 minutes. Remove contact lenses, if possible. Get medical advice/attention immediately.
Following skin contact	In case of contact with skin or hair, take off all the contaminated clothing. Wash the skin with water or take a shower. If you feel unwell, get medical advice/attention. Wash contaminated clothing before reuse.
Following inhalation	If exposure occurs or is suspected, seek medical advice or take appropriate medical action.
Following ingestion	Do not use mouth-to-mouth resuscitation if victim ingested or inhaled. Use proper respiratory medical device.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms	No data available
Risks	No data available

5. FIRE FIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media	Use powder fire extinguisher, dry sand or dirt
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5.2 Special hazards arising from the substance or mixture

Specific hazards during firefighting	No data available
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5.3 Precautions for fire-fighters

Special protective equipment for firefighters	Wear appropriate protective apparatus. Extinguish while maintaining safe distance away from fire areas.
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5.4 Further information

No information available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions	Note the substances and conditions to avoid.
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6.2 Environmental precautions

Environmental precautions	Avoid dispersal of spill material and runoff into waterway, sewers, drainage, or contained areas.
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6.3 Methods and material for containment and cleaning up

Method for cleaning up	Soak up with inert absorbent material and place into the containers for chemical waste.
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7. HANDLING AND STORAGE

7.1 Precautions for safe handling

MATERIAL SAFETY DATA SHEET

Product Name	Buffer AW
Advice on safe handling	Do not handle the product until you have read and understood all safety precautions. Wash the handling area thoroughly after work. Take caution in opening the container.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage rooms and vessels	Store in a well-ventilated area. Keep the container tightly sealed. Carefully reseal the opened container and ensure it is kept upright to prevent leakage.
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7.3 Specific end use(s)

Specific end use(s)	Laboratory chemicals.
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8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

KOSHA exposure limits	No data available
ACGIH exposure limits	No data available
Biological Exposure Indices (BEIs)	No data available

8.2 Exposure controls

Use appropriate engineering controls such as process enclosure, local exhaust ventilation, or maintaining airborne concentrations below recommended exposure limits.
Emergency eye wash fountains and safety showers should be available in the immediate vicinity of use/handling.

8.3 Personal protective equipment

Respiratory protection	Wear suitable protection tested and approved under appropriate government standards such as KOSHA.
Suitable eye protection	Use tightly fitting safety goggles or face protection. Use eye protection such as face shields or safety glasses certified under appropriate government standard.
Hand protection	Wear suitable gloves tested and approved under appropriate government standards such as KOSHA. Check gloves before use. Dispose of gloves after use according to relevant regulations and GLP standards. Wash and dry hands.
Skin and body protection	Wear suitable chemical-resistant clothing. Choose according to the concentration and amount of material in the work area.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Physical state	liquid
Color	colorless
Odor	Odorless
Odour Threshold	No data available
pH	No data available
Melting point/freezing point	No data available
Boiling point/boiling range	No data available

MATERIAL SAFETY DATA SHEET

Product Name	Buffer AW
Flash point	No data available
Evaporation rate	No data available
Flammability (solid, gas)	No data available
Upper/lower flammability or explosive limits	No data available
Vapour pressure	No data available
Solubility (ies)	No data available
Vapour density	No data available
Specific gravity	No data available
Partial coefficient n-octanol/water	No data available
Auto-ignition temperature	Not determined
Decomposition temperature	No data available
Viscosity	No data available
Molecular weight	No data available

9.2 Other information

No data available

10. STABILITY AND REACTIVITY

10.1 Chemical stability and possibility of hazardous reactions

Stable under recommended storage conditions

10.2 Conditions to avoid

Ignition sources such as heat, sparks, and flames

10.3 Materials to avoid

Strong oxidizing agents, strong bases, strong acids, metals

10.4 Hazardous decomposition products

Decomposition or combustion during burning may release irritating and highly toxic gases.

11. TOXICOLOGICAL INFORMATION

11.1 Routes of exposure

May cause irritation.

11.2 Information on toxicological effects

Acute toxicity

Oral

No data available

Dermal

No data available

Inhalation

No data available

Skin corrosion/irritation

No data available

Serious eye damage/eye irritation

MATERIAL SAFETY DATA SHEET

Product Name	Buffer AW
	No data available
<u>Respiratory sensitisation</u>	No data available
<u>Skin sensitisation</u>	No data available
<u>Carcinogenicity</u>	No data available
<u>Genotoxicity</u>	No data available
<u>Reproductive toxicity</u>	No data available
<u>Specific target organ toxicity - single exposure</u>	No data available
<u>Specific target organ toxicity - repeated exposure</u>	No data available
<u>Other harmful effects</u>	No data available
12. ECOLOGICAL INFORMATION	
12.1 Toxicity	
<u>Toxicity to Fish</u>	No data available
<u>Toxicity to Crustacean</u>	No data available
<u>Toxicity to Algae</u>	No data available
12.2 Persistnece and degradability	
<u>Persistence</u>	No data available
<u>Degradability</u>	No data available
12.3 Bioaccumulative potential	
<u>Bioaccumulation</u>	No data available
<u>Biodegradability</u>	No data available
12.4 Mobility in soil	No data available
12.5 Other adverse effects	No data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Dispose of residues and non-recyclable solutions through a government-approved waste disposal company.

13.2 Disposal considerations

Dispose of in accordance with all applicable environmental laws and regulations.

MATERIAL SAFETY DATA SHEET

Product Name

Buffer AW

14. TRANSPORT INFORMATION

14.1 UN number

Not regulated as a dangerous good

14.2 UN Proper shipping name

Not applicable

14.3 Transport hazard class(es)

Not applicable

14.4 Packing group

Not applicable

14.5 Environmental hazards

No data available

14.6 Special precautions for user

Not applicable

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

15. REGULATORY INFORMATION

15.1 Industrial Safety and Health Act

No data available

15.2 Toxic Chemicals Control Act

No data available

15.3 Safety Control of Dangerous Substances Act

No data available

15.4 Wastes Control Act

Dispose of in accordance with all waste control regulations

15.5 Other requirements in domestic and other countries

No data available

16. OTHER INFORMATION

Issued date

2016-03-29

Revision number

3

Revision date

2023-05-16

Reference

Corporate Solution From Thomson Micromedex
 ECB-ESIS (European Chemical Substances Information System)
 ECOTOX Database, EPA
 IUCLID Chemical Data Sheet
 International Chemical Safety Cards (ICSC)
 TOXNET, U.S. National Library of Medicine
 The Chemical Database, The Department of Chemistry at the University of Akron
 Industrial poisoning handbook, Shin Kwang Publishing Co.
 Hazardous materials information management system, National Emergency Management
 Chemicals information system, National Institute of Environmental Research

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

MATERIAL SAFETY DATA SHEET

Product Name

Buffer PW

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product identifier

Product name	Buffer PW
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1.2 Relevant identified uses of the substance or mixture and uses advised against

Use of the substance or mixture	Laboratory chemicals
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1.3 Details of the supplier of the safety data sheet

Name	GENEALL BIOTECHNOLOGY CO., LTD
Address	GeneAll Bldg., 303-7, Dongnam-ro, Songpa-gu, Seoul, 05729, Korea
Information contact	<+82-2-407-0096
E-Mail (competent person)	sales@geneall.com
Emergency Telephone Number	<+82-2-407-0096

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008 [CLP/GHS]

This product is NOT classified as regulated substance and NOT subject to label elements.

2.2 Label elements

Labelling according to Regulation (EC) No 1272/2008 [CLP/GHS]

Hazard pictograms	No data available
Signal word	No data available
Hazardous statements	No data available
Precautionary statements	
Prevention	No data available
Response	No data available
Storage	No data available
Disposal	No data available

2.3 Other Non-GHS Classification

No data available

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance name	CAS No.	Concentration (%)
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No hazardous substance

4. FIRST AID MEASURES

4.1 Description of first aid measures

General informations	Notify doctor/physician about the substance to take necessary actions.
Following eye contact	Rinse cautiously with water for at least 15 minutes. Remove contact lenses. Get medical advice/attention.
Following skin contact	In the case of contact with skin (or hair), remove immediately all contaminated clothing. Rinse skin with water/shower. Immediately seek medical advice/attention, if you feel unwell. Wash before reuse.
Following inhalation	Move patients into fresh air and help them to get rest. Get medical advice/attention if you feel unwell. If not breathing, give artificial respiration.
Following ingestion	If swallowed, rinse mouth, do NOT attempt cardiopulmonary resuscitation. If exposed or concerned, seek medical advice/attention.

5. FIRE FIGHTING MEASURES

5.1 Extinguishing media

MATERIAL SAFETY DATA SHEET

Product Name	Buffer PW
Suitable extinguishing media	Small fire: dry sand, dry chemical, alcohol-resistant foam, water spray, regular foam, carbon dioxide (suitable extinguishing media)
5.2 Special hazards arising from the substance or mixture	
Specific hazards during firefighting	No data available
5.3 Precautions for fire-fighters	
Special protective equipment for firefighters	Wear self-contained breathing apparatus when fighting fire. Spills may cause contamination. If safe to do, remove container from fire area.
5.4 Further information	
No data available	
6. ACCIDENTAL RELEASE MEASURES	
6.1 Personal precautions, protective equipment and emergency procedures	
Personal precautions	Do NOT handle damaged containers or spill without appropriate protection. Avoid contact with the eyes, skin, and clothing.
6.2 Environmental precautions	
Environmental precautions	Do NOT directly release into the environment.
6.3 Methods and material for containment and cleaning up	
Method for cleaning up	Keep in suitable, closed containers for disposal.
7. HANDLING AND STORAGE	
7.1 Precautions for safe handling	
Advice on safe handling	Avoid prolonged or repeated contact with skin. Avoid contact with the eyes, skin, and clothing.
7.2 Conditions for safe storage, including any incompatibilities	
Requirements for storage rooms and vessels	Keep the container tightly sealed. Avoid contact with the eyes, skin, and clothing.
7.3 Specific end use(s)	
Specific end use(s)	Laboratory chemicals.
8. EXPOSURE CONTROLS/PERSONAL PROTECTION	
8.1 Control parameters	
KOSHA exposure limits	No data available
ACGIH exposure limits	No data available
Biological Exposure Indices (BEIs)	No data available
8.2 Exposure controls	
No data available	
8.3 Personal protective equipment	
Respiratory protection	No data available
Suitable eye protection	Wear chemical-resistant eye and face protection.
Hand protection	Wear suitable chemical-resistant gloves.
Skin and body protection	Wear suitable chemical-resistant clothing.
9. PHYSICAL AND CHEMICAL PROPERTIES	
9.1 Information on basic physical and chemical properties	
Physical state	liquid
Color	No data available

MATERIAL SAFETY DATA SHEET

Product Name	Buffer PW
Odor	No data available
Odour Threshold	No data available
pH	No data available
Melting point/freezing point	No data available
Boiling point/boiling range	No data available
Flash point	No data available
Evaporation rate	No data available
Flammability (solid, gas)	-/-
Upper/lower flammability or explosive limits	No data available
Vapour pressure	No data available
Solubility (ies)	No data available
Vapour density	No data available
Specific gravity	No data available
Partial coefficient n-octanol/water	No data available
Auto-ignition temperature	No data available
Decomposition temperature	No data available
Viscosity	No data available
Molecular weight	No data available

9.2 Other information

No data available

10. STABILITY AND REACTIVITY

10.1 Chemical stability and possibility of hazardous reactions

Stable under recommended storage conditions
 Stable under normal pressure and room temperature condition
 Non-flammable : this material does not burn but may evolve corrosive/toxic fumes when heated.

10.2 Conditions to avoid

No data available

10.3 Materials to avoid

No data available

10.4 Hazardous decomposition products

No data available

11. TOXICOLOGICAL INFORMATION

11.1 Routes of exposure

No data available

11.2 Information on toxicological effects

Acute toxicity

Oral

No data available.

Dermal

No data available.

Inhalation

No data available.

Skin corrosion/irritation

No data available.

Serious eye damage/eye irritation

No data available.

Respiratory sensitisation

MATERIAL SAFETY DATA SHEET

Product Name	Buffer PW
	No data available.
<u>Skin sensitisation</u>	No data available.
<u>Carcinogenicity</u>	No data available.
<u>Genotoxicity</u>	No data available.
<u>Reproductive toxicity</u>	No data available.
<u>Specific target organ toxicity - single exposure</u>	No data available.
<u>Specific target organ toxicity - repeated exposure</u>	No data available.
<u>Other harmful effects</u>	No data available.
12. ECOLOGICAL INFORMATION	
12.1 Toxicity	
<u>Toxicity to Fish</u>	No data available.
<u>Toxicity to Crustacean</u>	No data available.
<u>Toxicity to Algae</u>	No data available.
12.2 Persistence and degradability	
<u>Persistence</u>	No data available.
<u>Degradability</u>	No data available.
12.3 Bioaccumulative potential	
<u>Bioaccumulation</u>	No data available.
<u>Biodegradability</u>	No data available.
12.4 Mobility in soil	No data available.
12.5 Other adverse effects	No data available.
13. DISPOSAL CONSIDERATIONS	
13.1 Waste treatment methods	
Dispose of in accordance with all applicable environmental laws and regulations.	
13.2 Disposal considerations	
Dispose of in accordance with all applicable environmental laws and regulations.	
14. TRANSPORT INFORMATION	
14.1 UN number	This product is NOT categorized under UN number
14.2 UN Proper shipping name	Not applicable
14.3 Transport hazard class(es)	Not applicable
14.4 Packing group	Not applicable
14.5 Environmental hazards	No data available.

MATERIAL SAFETY DATA SHEET

Product Name

Buffer PW

14.6 Special precautions for user

For personal protection see section 8.

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

15. REGULATORY INFORMATION**15.1 Industrial Safety and Health Act**

Not applicable

15.2 Toxic Chemicals Control Act

Not applicable

15.3 Safety Control of Dangerous Substances Act

Not applicable

15.4 Wastes Control Act

In accordance with international laws and regulations of country.

15.5 Other requirements in domestic and other countries

Not applicable

16. OTHER INFORMATION**Issued date**

2016-10-28

Revision number

2

Revision date

2023-10-12

Reference

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- END OF SAFETY DATA SHEET -

MATERIAL SAFETY DATA SHEET

Product Name

Buffer EB

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product identifier

Product name Buffer EB

1.2 Relevant identified uses of the substance or mixture and uses advised against

Use of the substance or mixture Laboratory chemicals

1.3 Details of the supplier of the safety data sheet

Name GENEALL BIOTECHNOLOGY CO., LTD
 Address GeneAll Bldg., 303-7, Dongnam-ro, Songpa-gu, Seoul, 05729, Korea
 Information contact <+82-2-407-0096
 E-Mail (competent person) sales@geneall.com
 Emergency Telephone Number <+82-2-407-0096

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008 [CLP/GHS]

This product is NOT classified as regulated substance and NOT subject to label elements.

2.2 Label elements

Labelling according to Regulation (EC) No 1272/2008 [CLP/GHS]

Hazard pictograms No data available
 Signal word No data available
 Hazardous statements No data available
 Precautionary statements
 Prevention No data available
 Response No data available
 Storage No data available
 Disposal No data available

2.3 Other Non-GHS Classification

No data available

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance name

CAS No.

Concentration (%)

No hazardous substance

4. FIRST AID MEASURES

4.1 Description of first aid measures

General informations Notify doctor/physician about the substance to take necessary actions.
 Following eye contact Rinse cautiously with water for at least 15 minutes.
 Remove contact lenses.
 Get medical advice/attention.
 Following skin contact In the case of contact with skin (or hair), remove immediately all contaminated clothing.
 Rinse skin with water/shower.
 Immediately seek medical advice/attention, if you feel unwell.
 Wash before reuse.
 Following inhalation Move patients into fresh air and help them to get rest.
 Get medical advice/attention if you feel unwell.
 If not breathing, give artificial respiration.

MATERIAL SAFETY DATA SHEET

Product Name	Buffer EB
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Following ingestion

If swallowed, rinse mouth, do NOT attempt cardiopulmonary resuscitation.
If exposed or concerned, seek medical advice/attention.

5. FIRE FIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media

Small fire: dry sand, dry chemical, alcohol-resistant foam, water spray, regular foam, carbon dioxide (suitable extinguishing media)

5.2 Special hazards arising from the substance or mixture

Specific hazards during firefighting

No data available

5.3 Precautions for fire-fighters

Special protective equipment for firefighters

Wear self-contained breathing apparatus when fighting fire.
Spills may cause contamination.
If safe to do, remove container from fire area.

5.4 Further information

No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions

Do NOT handle damaged containers or spill without appropriate protection.
Avoid contact with the eyes, skin, and clothing.

6.2 Environmental precautions

Environmental precautions

Do NOT directly release into the environment.

6.3 Methods and material for containment and cleaning up

Method for cleaning up

Keep in suitable, closed containers for disposal.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Advice on safe handling

Avoid prolonged or repeated contact with skin.
Avoid contact with the eyes, skin, and clothing.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage rooms and vessels

Keep the container tightly sealed.
Avoid contact with the eyes, skin, and clothing.

7.3 Specific end use(s)

Specific end use(s)

Laboratory chemicals.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

KOSHA exposure limits

No data available

ACGIH exposure limits

No data available

Biological Exposure Indices (BEIs)

No data available

8.2 Exposure controls

No data available

MATERIAL SAFETY DATA SHEET

Product Name

Buffer EB

8.3 Personal protective equipment

Respiratory protection	No data available
Suitable eye protection	Wear chemical-resistant eye and face protection.
Hand protection	Wear suitable chemical-resistant gloves.
Skin and body protection	Wear suitable chemical-resistant clothing.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Physical state	liquid
Color	No data available
Odor	No data available
Odour Threshold	No data available
pH	No data available
Melting point/freezing point	No data available
Boiling point/boiling range	No data available
Flash point	No data available
Evaporation rate	No data available
Flammability (soild, gas)	-/-
Upper/lower flammability or explosive limits	No data available
Vapour pressure	No data available
Solubility (ies)	No data available
Vapour density	No data available
Specific gravity	No data available
Partial coefficient n-octanol/water	No data available
Auto-ignition temperature	No data available
Decomposition temperature	No data available
Viscosity	No data available
Molecular weight	No data available

9.2 Other information

No data available

10. STABILITY AND REACTIVITY

10.1 Chemical stability and possibility of hazardous reactions

Stable under recommended storage conditions
 Stable under normal pressure and room temperature condition
 Non-flammable : this material does not burn but may evolve corrosive/toxic fumes when heated.

10.2 Conditions to avoid

No data available

10.3 Materials to avoid

No data available

10.4 Hazardous decomposition products

MATERIAL SAFETY DATA SHEET

Product Name

Buffer EB

No data available

11. TOXICOLOGICAL INFORMATION

11.1 Routes of exposure

No data available

11.2 Information on toxicological effects

Acute toxicity

Oral

No data available.

Dermal

No data available.

Inhalation

No data available.

Skin corrosion/irritation

No data available.

Serious eye damage/eye irritation

No data available.

Respiratory sensitisation

No data available.

Skin sensitisation

No data available.

Carcinogenicity

No data available.

Genotoxicity

No data available.

Reproductive toxicity

No data available.

Specific target organ toxicity - single exposure

No data available.

Specific target organ toxicity - repeated exposure

No data available.

Other harmful effects

No data available.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to Fish

No data available.

Toxicity to Crustacean

No data available.

Toxicity to Algae

No data available.

12.2 Persistence and degradability

Persistence

No data available.

Degradability

No data available

12.3 Bioaccumulative potential

MATERIAL SAFETY DATA SHEET

Product Name	Buffer EB
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Bioaccumulation

No data available

Biodegradability

No data available

12.4 Mobility in soil

No data available

12.5 Other adverse effects

No data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Dispose of in accordance with all applicable environmental laws and regulations.

13.2 Disposal considerations

Dispose of in accordance with all applicable environmental laws and regulations.

14. TRANSPORT INFORMATION

14.1 UN number

This product is NOT categorized under UN number

14.2 UN Proper shipping name

Not applicable

14.3 Transport hazard class(es)

Not applicable

14.4 Packing group

Not applicable

14.5 Environmental hazards

No data available

14.6 Special precautions for user

For personal protection see section 8.

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

15. REGULATORY INFORMATION

15.1 Industrial Safety and Health Act

Not applicable

15.2 Toxic Chemicals Control Act

Not applicable

15.3 Safety Control of Dangerous Substances Act

Not applicable

15.4 Wastes Control Act

In accordance with international laws and regulations of country.

15.5 Other requirements in domestic and other countries

Not applicable

16. OTHER INFORMATION

Issued date

2016-05-17

Revision number

2

Revision date

2023-10-11

MATERIAL SAFETY DATA SHEET

Product Name

Buffer EB

Reference

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- END OF SAFETY DATA SHEET -

MATERIAL SAFETY DATA SHEET

Product Name

RNase A

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product identifier

Product name RNase A

1.2 Relevant identified uses of the substance or mixture and uses advised against

Use of the substance or mixture Laboratory chemicals

1.3 Details of the supplier of the safety data sheet

Name GENEALL BIOTECHNOLOGY CO., LTD
 Address GeneAll Bldg., 303-7, Dongnam-ro, Songpa-gu, Seoul, 05729, Korea
 Information contact <+82-2-407-0096
 E-Mail (competent person) sales@geneall.com
 Emergency Telephone Number <+82-2-407-0096

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008 [CLP/GHS]

This product is NOT classified as regulated substance and NOT subject to label elements.

2.2 Label elements

Labelling according to Regulation (EC) No 1272/2008 [CLP/GHS]

Hazard pictograms No data available
 Signal word No data available
 Hazardous statements No data available
 Precautionary statements
 Prevention No data available
 Response No data available
 Storage No data available
 Disposal No data available

2.3 Other Non-GHS Classification

No data available

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance name	CAS No.	Concentration (%)
RIBONUCLEASE A TYPE I	9001-99-4	2-10

4. FIRST AID MEASURES

4.1 Description of first aid measures

General informations Notify doctor/physician about the substance to take necessary actions.
 Following eye contact In case of contact with substance, flush the eyes immediately with water for at least 20 minutes. Immediately seek medical advice/attention.
 Following skin contact In case of contact with substance, flush the skin immediately with water for at least 20 minutes. Remove contaminated clothing and footwear and isolate contaminated areas. Take off contaminated clothing and wash before reuse. Get an immediate medical treatment.
 Following inhalation Get an immediate medical treatment. Move to an area with fresh air. Try artificial respiration, if not breathe. Provide oxygen, if it is hard to breathe.
 Following ingestion Do not give any food to an unconscious person. Get an immediate medical treatment.

5. FIRE FIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media Small fire: dry sand, dry chemical, alcohol-resistant foam, water spray, regular foam, carbon dioxide (suitable extinguishing media)
 Large fire: Use water spray/mist, general foam (suitable extinguishing media)

MATERIAL SAFETY DATA SHEET

Product Name	RNase A
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5.2 Special hazards arising from the substance or mixture

Specific hazards during firefighting

Can be ignited by heat, sparks, or flames.
If heated, containers may explode.
Some may combust but does not ignite easily.
Can produce irritant and toxic gases in case of fire.
Inhalation of the substance may be harmful.
Some liquids may produce vapors that can cause dizziness or asphyxiation.

5.3 Precautions for fire-fighters

Special protective equipment for firefighters

Move containers from fire area if it's not dangerous.
Some may be transported at high temperatures.
Spills may cause contamination. Contact may cause burns to skin and eyes.
Dig a ditch for the disposal of the fire fighting water and keep the material from dispersing.
In case of tank fire:
Cool the container with plenty of water even after the fire is extinguished.
If there's a high-pitched sound or the tank changes color, leave immediately.
Keep away from the tank covered in flames.

5.4 Further information

No information available.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions

Remove all ignition sources. Stop the leak, if it's not dangerous.
Be aware of the substances and conditions to avoid.
Ventilate the contaminated area.
Do not touch the exposed material. Prevent dust formation.

6.2 Environmental precautions

Environmental precautions

Avoid spread into waterway, sewers, drains, or confined areas.

6.3 Methods and material for containment and cleaning up

Method for cleaning up

(small leaks) Wash the contaminated area with plenty of water.
(small leaks) Absorb it with sand or an inert material and place it into a container.
(large leaks) Make a ditch keeping distance from the leaks.
Use a clean shovel to place the spilled material into a clean, dry container.
Loosely close the container and move it away from the spill area.
Cover with plastic sheet to prevent spread and keep dry.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Advice on safe handling

Be aware of the substances and conditions to avoid.
Wash thoroughly after handling.
Work with reference to section 8.
Be cautious of high temperatures.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage rooms and vessels

Keep container tightly closed.
Store in a cool, dry place.
Be aware of the substances and conditions to avoid.

7.3 Specific end use(s)

Specific end use(s)

Laboratory chemicals.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

KOSHA exposure limits

No data available

ACGIH exposure limits

No data available

Biological Exposure Indices (BEIs)

No data available

8.2 Exposure controls

MATERIAL SAFETY DATA SHEET

Product Name	RNase A
	Use appropriate engineering controls and local exhaust ventilation below recommended exposure limits.
8.3 Personal protective equipment	
Respiratory protection	Wear respiratory protection, according to the physical and chemical properties of the exposed material which has been tested and approved under appropriate government standard. Proper protective apparatus for respiration such like Face filter dust mask, air filter dust mask, electric fan attached dust mask is recommended. If oxygen levels are insufficient (<19.6%), wear supplied-air respirators or self-contained breathing apparatus.
Suitable eye protection	Wear protective goggles that are breathable to safeguard your eyes against particulate matter that may cause eye irritation or other health hazards.
Hand protection	Wear suitable chemical-resistant gloves, considering physical and chemical properties of chemical substances.
Skin and body protection	Wear suitable chemical-resistant clothing, considering physical and chemical properties of chemical substances.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Physical state	liquid
Color	colorless
Odor	No data available
Odour Threshold	No data available
pH	No data available
Melting point/freezing point	No data available
Boiling point/boiling range	No data available
Flash point	No data available
Evaporation rate	No data available
Flammability (solid, gas)	No data available
Upper/lower flammability or explosive limits	-/-
Vapour pressure	No data available
Solubility (ies)	No data available
Vapour density	No data available
Specific gravity	No data available
Partial coefficient n-octanol/water	No data available
Auto-ignition temperature	No data available
Decomposition temperature	No data available
Viscosity	No data available
Molecular weight	No data available

9.2 Other information

No data available

10. STABILITY AND REACTIVITY

10.1 Chemical stability and possibility of hazardous reactions

Stable under ambient temperature and pressure conditions.
If heated, containers may explode.
Some may combust but does not ignite easily.
Can produce irritant and toxic gases in case of fire.
Inhalation of the substance may be harmful.
Some liquids may produce vapors that can cause dizziness or asphyxiation.

10.2 Conditions to avoid

Ignition sources such as heat, sparks, and flames

10.3 Materials to avoid

flammable material, irritant/toxic gas

10.4 Hazardous decomposition products

MATERIAL SAFETY DATA SHEET

Product Name	RNase A
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No data available

11. TOXICOLOGICAL INFORMATION

11.1 Routes of exposure

No data available

11.2 Information on toxicological effects

Acute toxicity

Oral

No data available.

Dermal

No data available.

Inhalation

No data available.

Skin corrosion/irritation

No data available.

Serious eye damage/eye irritation

No data available.

Respiratory sensitisation

No data available.

Skin sensitisation

No data available.

Carcinogenicity

No data available.

Genotoxicity

No data available.

Reproductive toxicity

No data available.

Specific target organ toxicity - single exposure

No data available.

Specific target organ toxicity - repeated exposure

No data available.

Other harmful effects

No data available.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to Fish

No data available.

Toxicity to Crustacean

No data available.

Toxicity to Algae

No data available.

12.2 Persistence and degradability

Persistence

No data available.

Degradability

No data available

12.3 Bioaccumulative potential

Bioaccumulation

No data available

Biodegradability

No data available

12.4 Mobility in soil

No data available

12.5 Other adverse effects

No data available

MATERIAL SAFETY DATA SHEET

Product Name

RNase A

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Dispose of in accordance with all applicable environmental laws and regulations.

13.2 Disposal considerations

Dispose of in accordance with all applicable environmental laws and regulations.

14. TRANSPORT INFORMATION

14.1 UN number

This product is NOT categorized under UN number

14.2 UN Proper shipping name

Not applicable

14.3 Transport hazard class(es)

Not applicable

14.4 Packing group

Not applicable

14.5 Environmental hazards

No data available

14.6 Special precautions for user

For personal protection see section 8.

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

15. REGULATORY INFORMATION

15.1 Industrial Safety and Health Act

No data available

15.2 Toxic Chemicals Control Act

No data available

15.3 Safety Control of Dangerous Substances Act

No data available

15.4 Wastes Control Act

Dispose of as hazardous waste in compliance with local and national regulations.

15.5 Other requirements in domestic and other countries

Not applicable

16. OTHER INFORMATION

Issued date

2016-02-12

Revision number

2

Revision date

2023-05-22

Reference

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- END OF SAFETY DATA SHEET -