

Product Name

ExiPrep Buffer Cartridge 1

1. Chemical and Manufacturer Information

A. Product Name	ExiPrep Buffer Cartridge 1
B. Recommended Usage and Limitations	
Recommended Usage	This product is designed for DNA/RNA extraction from various samples using the automated extraction instrument ExiPrep. Product is used for sample loading.
Limitations of Usage	This product is designed for the purpose of molecular diagnostic experimentation of clinical samples. Product users must be certified for clinical sample handling or trained in molecular biological experimental methods.
C. Manufacturer/Supplier/Distributor Information	
Company Name	Bioneer Corporation
Address	Daedeok-gu Munpyeong-dong 49-3, Daejeon, South Korea
Emergency Contact Number	+82-42-930-8777

2. Risks·Hazards

A. Risk·Hazard Classification	Volatile liquid : Class 2 Acute toxicity (oral): Class 4 Skin corrosion/irritation: Class 4 Extreme eye damage/eye irritation : Class 2 Reproductive cell mutation : Class 1B Reproductive toxicity : Class 1A Specific target organ toxicity (single exposure) : Class 3 (Respiratory system irritation) Specific target organ toxicity (single exposure) : Class 3 (Anesthetic) Specific target organ toxicity (repeat exposure) : Class 1
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B. Caution Items Including Preventative Measures

Warning Symbols



Warning Phrase

Caution

Risk·Hazard Phrase

H225 Highly flammable liquid and vapour.
 H302 Hazardous if swallowed
 H315 Irritation on skin
 H319 Extreme irritation to eyes
 H335 May cause respiratory irritation.
 H336 May cause sleepiness or dizziness
 H340 May cause genetic defects
 H360 May damage fetus or reproductive abilities

H372 Chronic or repeated exposure causes specific target organ damage

Preventative Measure Phrases

Prevention

P201 Obtain special instructions before use.

P202 Do not handle until all safety precautions have been read and understand.

Prevention

P210 Keep away from heat/sparks/open flames/hot surfaces. – No smoking.

P233 Keep container tightly closed.

P240 Ground/bond container and receiving equipment.

P241 Use explosion–proof electrical/ventilating/lighting/equipment.

P242 Use only non–sparking tools.

P243 Take precautionary measures against static discharge.

P260 Do not breathe dust/fume/gas/mist/vapours/spray.

P261 Avoid breathing dust/fume/gas/mist/vapours/spray.

P264 Wash hands thoroughly after handling.

P270 Do not eat, drink or smoke when using this product.

P271 Use only outdoors or in a well–ventilated area.

P280 Wear protective glove/protective clothing/eye protection/face protection.

P281 Use personal protective equipment as required.

Response

P301+P312 Seek medical attention if swallowed and feeling uncomfortable.

P302+P352 IF ON SKIN: Gently wash with plenty of soap and water.

P303+P361+P353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.

P304+P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P308+P313 IF exposed or concerned: Get medical advice/ attention.

P312 Call a POISON CENTER or doctor/physician you feel unwell.

P314 Get medical advice/attention if you feel unwell.

P330 Rinse mouth.

P332+P313 If skin irritation occurs: Get medical advice/ attention.

P337+P313 If eye irritation persists: Get medical advice/attention.

P362 Take off contaminated clothing and wash before reuse.

P370+P378 In case of fire: Use alcohol–resistant form, Dry powder extinguishing agent, Carbon Dioxide for extinction.

Storage

P403+P233 Store in a well–ventilated place. Keep container tightly closed.

P403+P235 Store in a well–ventilated place. Keep cool.

P405 Store locked up.

Disposal

P501 Dispose of contents/container to information seted forth in the relevant laws and regulations.

C. Other Risks·Hazards Not Included in Risk·Hazard Classification (NFPA)

Guanidine chloride

Health

2

Fire

1

Reactivity

0

Ethyl alcohol

Health	2
Fire	3
Reactivity	0
Polyoxyethylene (20) sorbitan monooleate	
Health	0
Fire	1
Reactivity	0

3. Ingredient Information

Ingredient Name	Other Names	CAS No.	% of Total
Guanidine chloride	Aminomethanamidinehydrochloride Aminoformamidinehydrochloride Guanidinium chloride	50-01-1	10
Ethyl alcohol	ETHANOL	64-17-5	30
Polyoxyethylene (20) sorbitan monooleate	Polyethylene glycol sorbitan monooleate Polyoxyethylenesorbitan monooleate Polysorbate 80	9005-65-6	2

4. First-Aid Measures

A. Upon Eye Contact	Flush eyes with water for several minutes. Remove contact lenses if possible. Seek immediate medical attention if eye irritation persists.
B. Upon Skin Contact	Remove contaminated clothing upon contact with skin (or hair). Shower/wash skin. Seek medical attention if you feel irritation. Remove contaminated clothing and shoes, and quarantine the contaminated region In case of minor exposure, prevent further spread of contamination. For burns, cool the affected area with cold water as long as possible, and do not remove clothing that has bound to skin. Wash skin with soap and water.
C. Upon Inhalation	Seek medical attention if exposure or contact is suspected. Upon exposure to excess dust or fumes, ventilate with fresh air. If coughing or other symptoms are present, seek medical attention.
D. Upon Ingestion	Seek medical attention if exposure or contact is suspected. Rinse mouth If ingestion or inhalation is suspected, do not perform mouth-to-mouth resuscitation but use a medical breathing device.
E. Other Cautions	Contact medical service upon exposure and perform emergency measures such as source analysis. Inform medical staff of substance and take all precautionary protection measures.

5. Explosion-Fire Measures

A. Proper(Improper) Extinguishing Material	
Proper(Improper) Extinguishing Material	To extinguish fire related to this material, use alcohol foam, carbon dioxide or water spraying. Use dry sand or earth for fire suppression
B. Specific Hazards from Chemicals	
Specific Hazards from Chemicals	Highly volatile liquid and vapor May cause fire and explosion from extreme polymerization Vapor may cause ignition when near ignition source

Toxic gases may form during heat decomposition or combustion.
May form explosive mixture near and above ignition point.
Container may explode upon heating.
Highly flammable: Easily ignited with heat, sparks or flames.
Leaks may lead to fire/explosions
Vapor explosion hazard indoors, outdoors and in sewers.
Portions may burn but will not ignite easily.
May form explosive mixture when vapor is mixed with air.
Non-volatile. The chemical itself does not burn but heating may disintegrate and form corrosive/toxic fumes.

C. Firefighting Protection and Precautions

Guanidine chloride

Rescuers must wear appropriate protection.
Maintain a safe distance when extinguishing flames.
Mostly lighter than water.
Most vapors are heavier than air, leading to ground-level spreading and accumulation in low ground or enclosed spaces.
May be transported when hot.
May be transported when melted.
Dig a trough to contain the spread of extinguished fluid.
Remove container if conditions are not hazardous.
During tank fires, extinguish at maximum distance or with unmanned extinguishing devices.
For tank fires, cool the container with excess water even after fire is extinguished.
During tank fires, if a high pitched sound emits from the pressure release valve or the tank becomes discolored, retreat immediately.
During tank fires, retreat from a tank consumed in flames.
During tank fires, if the fire is large-scale, use an unmanned extinguishing device or retreat and let the fire burn.

Ethyl alcohol

Rescuers must wear appropriate protection.
Maintain a safe distance when extinguishing flames.
Mostly lighter than water.
Most vapors are heavier than air, leading to ground-level spreading and accumulation in low ground or enclosed spaces.
May be transported when hot.
May be transported when melted.
Dig a trough to contain the spread of extinguished fluid.
Remove container if conditions are not hazardous.
For tank fires, extinguish at maximum distance or with unmanned extinguishing devices.
For tank fires, cool the container with excess water even after fire is extinguished.
During tank fires, if a high pitched sound emits from the pressure release valve or the tank becomes discolored, retreat immediately.
During tank fires, retreat from a tank consumed in flames.
During tank fires, if the fire is large-scale, use an unmanned extinguishing device or retreat and let the fire burn.

Polyoxyethylene (20) sorbitan monooleate

Rescuers must wear appropriate protection.
Maintain a safe distance when extinguishing flames.
Mostly lighter than water.
Most vapors are heavier than air, leading to ground-level spreading and accumulation in low ground or enclosed spaces.
May be transported when hot.

May be transported when melted.

Dig a trough to contain the spread of extinguished fluid.

Remove container if conditions are not hazardous.

For tank fires, extinguish at maximum distance or with unmanned extinguishing devices.

For tank fires, cool the container with excess water even after fire is extinguished.

During tank fires, if a high pitched sound emits from the pressure release valve or the tank becomes discolored, retreat immediately.

During tank fires, retreat from a tank consumed in flames.

During tank fires, if the fire is large-scale, use an unmanned extinguishing device or retreat and let the fire burn.

6. Accidental Release Measures

A. Measures and Protection for Personal Protection	<p>Do not inhale dust·fumes·gas·mist·steam·spray.</p> <p>Remove all potential ignition sources.</p> <p>Immediately wipe spills and follow prevention measures.</p>
A. Measures and Protection for Personal Protection	<p>Quarantine the contaminated area.</p> <p>Do not enter contaminated area unless required or equipped with appropriate protective equipment.</p> <p>Remove all potential ignition sources.</p> <p>Ground all instruments when handling material.</p> <p>Stop release if conditions are not hazardous.</p> <p>Do not handle release or broken container without proper protection.</p> <p>You may use vapor suppression foam to minimize vapor formation.</p> <p>Use a plastic sheet to prevent spread.</p> <p>Be aware of conditions and chemicals to avoid.</p>
B. Measures for Environmental Protection	<p>Prevent introduction into waterways, sewers, basements and sealed spaces.</p>
C. Claining and Removal Measures	<p>Construct a bank to extinguish fire and collect water.</p> <p>Absorb spills with inert materials (e.g. dry sand or earth), and dispose of as chemical waste.</p> <p>Absorb liquids and clean contaminated area with detergent and water.</p> <p>Upon major leak, dig a trough away from source.</p> <p>Remove absorbed material using clean explosion-proof equipment.</p>

7. Handling and Storage

A. Handling Precautions	<p>Do not handle until all safety measures and precautions are read and understood.</p> <p>Use explosion-prevention electricity·ventilation·lighting·(...)·equipment.</p> <p>Use static-free tools.</p> <p>Take static prevention measures.</p> <p>Avoid inhalation of dust·fumes·gas·mist·steam·(...)·sprays.</p> <p>Wash hands thoroughly after handling.</p> <p>Do not eat, drink or smoke while using this product.</p> <p>Handle outside or in locations with adequate ventilation.</p> <p>Do not apply pressure, cut, fuse, solder, puncture, work or expose to fire, sparks, static electricity or other ignition sources.</p> <p>Residual material may exist after container is emptied. Follow all MSDS/label precautions.</p> <p>Handle/store with caution.</p>
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Open lid carefully.
 Prevent long-term or continuous exposure to skin.
 Ground all instruments when handling the material.
 Be aware of conditions and chemicals to avoid.
 Caution around heat.
 Do not enter storage areas lacking adequate ventilation.
 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
 Tightly seal container and store in well ventilated area.
 Store in a cool, well ventilated area.
 Completely drain empty drums and adequately seal. Immediately return drum to controller or place appropriately.
 Keep away from food and drinks.

B. Storage Precautions

8. Exposure Prevention and Personal Protection

A. Chemical Exposure Standards, Biological Exposure Standards Etc.

Domestic Regulation

Guanidine chloride	No Information
Ethyl alcohol	TWA – 1000ppm 1900mg/m ³
Polyoxyethylene (20) sorbitan monooleate	No Information

ACGIH Regulation

Guanidine chloride	No Information
Ethyl alcohol	TWA 1000 ppm
Polyoxyethylene (20) sorbitan monooleate	No Information

Biological Exposure Standards

Guanidine chloride	No Information
Ethyl alcohol	No Information
Polyoxyethylene (20) sorbitan monooleate	No Information

B. Proper Physical Management

Use process separation, local ventilation, minimizing air contamination below exposure thresholds etc. for physical management.
 When dust, fumes or mist is generated during use, sufficiently ventilate to maintain air contamination below exposure thresholds.
 Install face and emergency showers where this material is stored or used.

C. Personal Protection

Respiratory Protection

Guanidine chloride	<p>Use KOSHA certified respiratory protection appropriate for the particular material and its physical and chemical properties. For particulate chemicals, the following protective equipment is recommended: –Facial dust mask or air-filtration dust mask (high-efficiency particle filter) or electric fan dust mask (dust, mist, fume filter) For gas/liquid chemicals, the following respiratory protection is recommended: –Separated full-facial gas mask (organic chemical, or in case of acidic gases) acid gas mask, OR separated half-facial gas mask (organic chemical, or in case of acidic gases) acid gas mask, or direct full/half-facial gas mask (organic chemical, or in case of acidic gases) OR electric gas mask For lack of oxygen(<19.6%), use an air-supply or self-supply respiratory protection.</p>
Ethyl alcohol	<p>Use KOSHA certified respiratory protection appropriate for the particular material and its physical and chemical properties.</p>

If the exposure threshold is below 10000ppm, use a half-face gas mask with an appropriate (purification) filter with a protection level of above 10, considering the physical and chemical properties of the exposed gas/liquid

If the exposure threshold is below 25000ppm, use a loose-fitting hood/helmet-type electric breathing aid or continuous flow helmet-type gas mask with a protection level above 25, considering the physical and chemical properties of the exposed gas/liquid

If the exposure threshold is below 50000ppm, use a full/half-faced electric breathing mask or full/hood-type air-line mask with a protection level above 50, considering the physical and chemical properties of the exposed gas/liquid

If the exposure threshold is below 1000000ppm, use a (purification) filter type electric full-face gas mask or full/hood type air-line mask with a protection level above 1000, considering the physical and chemical properties of the exposed gas/liquid

If the exposure threshold is below 10000000ppm, use a pressure-demand full/helmet/hood-type air-line mask with a protection level above 10,000

Polyoxyethylene (20) sorbitan monooleate

Use KOSHA certified respiratory protection appropriate for the particular material and its physical and chemical properties.

For lack of oxygen(<19.6%), use an air-supply or self-supply respiratory protection.

Eye Protection

Use breathable protective eyewear for irritative or potentially hazardous particulate material.

Eye Protection

To protect eyes from irritative or other hazardous materials, use one of the following types of protection:

- For particulate material, breathable goggles
- For gaseous organic materials, sealed goggles
- For organic vapors, protective eyewear or breathable goggles

Install facial and emergency wash stations in easily accessible locations.

Hand Protection

Wear appropriate hand protection considering the material chemical and physical properties.

Body Protection

Wear appropriate body protection considering the material chemical and physical properties.

9. Physical and Chemical Properties

A. Appearance

Form

No Information

Color

No Information

B. Odor

No Information

C. Threshold Odor

No Information

D. pH

No Information

E. Freezing/Melting Point

No Information

F. Boiling Point and Range

No Information

G. Flash Point

No Information

H. Evaporation Speed

No Information

I. Flammability (Solid, Gas)

No Information

J. Ignition or Explosion Range (Upper/Lower)

No Information

K. Vapor Pressure

No Information

L. Solubility

No Information

M. Vapor Density

No Information

N. Specific Weight

No Information

O. n-Octanol/Water Solubility Coefficient

No Information

P. Self-Flammability

No Information

Q. decomposition Temperature	No Information
R. Viscosity	No Information
S. Molecular Weight	No Information

Guanidine chloride

A. Appearance	
Form	No Information
Color	No Information
B. Odor	None
C. Threshold Odor	No Information
D. pH	6.2 (10% solution)
E. Freezing/Melting Point	178 ~ 185°C
F. Boiling Point and Range	No Information
G. Flash Point	No Information
H. Evaporation Speed	No Information
I. Flammability (Solid, Gas)	No Information
J. Ignition or Explosion Range (Upper/Lower)	No Information
K. Vapor Pressure	0.00000176 mmHg (25°C (estimated))
L. Solubility	215 g/100mL (20°C)
M. Vapor Density	No Information
N. Specific Weight	1.3
O. n-Octanol/Water Solubility Coefficient	-1.7
P. Self-Flammability	No Information
Q. Decomposition Temperature	No Information
R. Viscosity	No Information
S. Molecular Weight	95.5

Ethyl alcohol

A. Appearance	
Form	Liquid
Color	Colorless
B. Odor	Wine or whiskey odor
C. Threshold Odor	10 ppm
D. pH	No Information
E. Freezing/Melting Point	-114.1 °C
F. Boiling Point and Range	78.5 °C
G. Flash Point	13 °C (c.c.)
H. Evaporation Speed	No Information
I. Flammability (Solid, Gas)	No Information
J. Ignition or Explosion Range (Upper/Lower)	19 / 3.3 %
K. Vapor Pressure	59.3 mmHg (25°C)
L. Solubility	100 g/100mL (25°C)
M. Vapor Density	1.59 (air=1)
N. Specific Weight	0.8 (water=1)
O. n-Octanol/Water Solubility Coefficient	-0.31
P. Self-Flammability	363 °C
Q. Decomposition Temperature	No Information
R. Viscosity	1.17 cP (20°C)

S. Molecular Weight	46.07
Polyoxyethylene (20) sorbitan monooleate	
A. Appearance	
Form	Liquid
Color	Yellow to yellow-brown
B. Odor	Distinct odor
C. Threshold Odor	No Information
D. pH	6
E. Freezing/Melting Point	-21 °C
F. Boiling Point and Range	> 100 °C
G. Flash Point	> 149 °C
H. Evaporation Speed	No Information
I. Flammability (Solid, Gas)	No Information
J. Ignition or Explosion Range (Upper/Lower)	- / -
K. Vapor Pressure	1 mmHg
L. Solubility	(soluble)
M. Vapor Density	(>1.0(air=1))
N. Specific Weight	1.06
O. n-Octanol/Water Solubility Coefficient	No Information
P. Self-Flammability	180 °C
Q. Decomposition Temperature	No Information
R. Viscosity	300 cSt (270-430)
S. Molecular Weight	No Information

10. Stability and Reactivity

A. Chemical Stability and Toxic Reaction Potential

Guanidine chloride	Toxic gases may form by decomposition under high heat. Container may explode upon heating. Portions may burn but will not ignite easily. Non-volatile. The chemical itself does not burn but heating may disintegrate and form corrosive/toxic fumes.
Ethyl alcohol	Highly flammable liquid and vapor Toxic gases may form by decomposition under high heat. May violently polymerize and cause fire and explosions May form explosive mixture near and above ignition point. Container may explode upon heating. Highly flammable: Easily ignited with heat, sparks or flames. Leaks may lead to fire/explosions Vapor explosion hazard indoors, outdoors and in sewers. May form explosive mixture when vapor is mixed with air.
Polyoxyethylene (20) sorbitan monooleate	Toxic gases may form by decomposition under high heat. Container may explode upon heating. Portions may burn but will not ignite easily. May form explosive mixture when vapor is mixed with air.

B. Conditions to Avoid

Guanidine chloride	Ignition sources such as heat, sparks, flames.
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Ethyl alcohol	Keep away from heat/sparks/open flames/hot surfaces. No smoking.
Polyoxyethylene (20) sorbitan monooleate	Keep away from heat/sparks/open flames/hot surfaces. No smoking.
C. Chemicals to Avoid	
Guanidine chloride	Flammable material, reducing material
Ethyl alcohol	No Information
Polyoxyethylene (20) sorbitan monooleate	Flammable material, toxic gas
D. Toxic Chemicals Formed with Decomposition	
Guanidine chloride	Irritating and highly toxic gases may form while burning through heat decomposition or combustion. corrosive/toxic fumes.
Ethyl alcohol	corrosive/toxic fumes.
Polyoxyethylene (20) sorbitan monooleate	No Information

11. Toxicology Information

A. Probable Exposure Paths

Guanidine chloride	May cause irritation, vomiting, loss of voice, respiratory distress, headache, lung abnormalities. May cause vomiting, diarrhea, sleep disorder, seizures. May cause irritation. May cause irritation, pupil dialation.
Ethyl alcohol	May cause irritation, respiratory distress, headache, dizziness, sleepiness, loss of motor function. May cause hypothermia or heating, change in blood pressure, vomiting, respiratory distress, irregular heartbeats, sleepiness, loss of direction, vocal impairment, emotional change, loss of motor function, visual impairment, pupil dialation, seizures, loss of consciousness. May cause irritation.
Polyoxyethylene (20) sorbitan monooleate	No Information

B. Health Hazard Information

Acute Toxicity

Oral

Guanidine chloride	LD50 475 mg/kg Rat
Ethyl alcohol	LD50 6200 mg/kg Rat
Polyoxyethylene (20) sorbitan monooleate	LD50 25000 mg/kg Mouse

Skin

Guanidine chloride	LD50 > 2000 mg/kg Rabbit
Ethyl alcohol	No Information
Polyoxyethylene (20) sorbitan monooleate	(-)

Inhalation

Guanidine chloride	LC50 5.319 mg/l 4 hr Rat
Ethyl alcohol	LC50 20000 ppm 10 hr Rat
Polyoxyethylene (20) sorbitan monooleate	(-)

Skin Corrosion or Irritation

Guanidine chloride	Severe irritation from skin irritation tests on rabbits.
Ethyl alcohol	No irritation
Polyoxyethylene (20) sorbitan monooleate	-

Severe Eye Damage or Irritation

Guanidine chloride	Medium irritation from eye irritation tests on rabbits.
Ethyl alcohol	Medium irritation.
Polyoxyethylene (20) sorbitan monooleate	Light irritation.

Respiratory Hypersensitivity

Guanidine chloride	No Information
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Ethyl alcohol	No Information
Polyoxyethylene (20) sorbitan monooleate	-
Skin Hypersensitivity	
Guanidine chloride	Negative (Guinea Pig)
Ethyl alcohol	No Information
Polyoxyethylene (20) sorbitan monooleate	-
Carcinogenic Properties	
Industrial Safety Regulation	
Guanidine chloride	No Information
Ethyl alcohol	No Information
Polyoxyethylene (20) sorbitan monooleate	No Information
Department of Labor Notice	
Guanidine chloride	No Information
Ethyl alcohol	No Information
Polyoxyethylene (20) sorbitan monooleate	No Information
IARC	
Guanidine chloride	No Information
Ethyl alcohol	Group 1
Polyoxyethylene (20) sorbitan monooleate	No Information
OSHA	
Guanidine chloride	No Information
Ethyl alcohol	No Information
Polyoxyethylene (20) sorbitan monooleate	No Information
ACGIH	
Guanidine chloride	No Information
Ethyl alcohol	A3
Polyoxyethylene (20) sorbitan monooleate	No Information
NTP	
Guanidine chloride	No Information
Ethyl alcohol	No Information
Polyoxyethylene (20) sorbitan monooleate	No Information
EU CLP	
Guanidine chloride	No Information
Ethyl alcohol	No Information
Polyoxyethylene (20) sorbitan monooleate	No Information
Reproductive Cell Mutation Properties	
Guanidine chloride	Microbe reverse mutation test: Negative, Chromosomal aberration test: Negative
Ethyl alcohol	White rat and mouse dominant lethal dose testing – Positive Reports of aneuploidy in mouse reproductive cells.
Polyoxyethylene (20) sorbitan monooleate	No Information
Reproductive Toxicity	
Guanidine chloride	No Information
Ethyl alcohol	Several reports of habitual large-quantity consumption of alcohol in humans having ill effects on fetuses including deformation.
Polyoxyethylene (20) sorbitan monooleate	No Information
Target Organ Toxicity (Single Exposure)	
Guanidine chloride	Irritation in respiratory system.

Ethyl alcohol	Affects human central nervous system and causes headache, fatigue, loss of focus. Inhalation may cause tracheal irritation, lightheadedness and pathologic somnolence.
Polyoxyethylene (20) sorbitan monooleate	No Information
Target Organ Toxicity (Repeat Exposure)	
Guanidine chloride	No Information
Ethyl alcohol	Affects human liver, nervous system (seizures, hallucinations etc.).
Polyoxyethylene (20) sorbitan monooleate	No Information
Inhalation Toxicity	
Guanidine chloride	No Information
Ethyl alcohol	No Information
Polyoxyethylene (20) sorbitan monooleate	No Information

12. Ecological Information

A. Biological Toxicity

Fish

Guanidine chloride	LC50 1758 mg/l 48 hr
Ethyl alcohol	LC50 42 mg/l 96 hr Oncorhynchus mykiss
Polyoxyethylene (20) sorbitan monooleate	LC50 817.890 mg/l 96 hr

Crustacean

Guanidine chloride	No Information
Ethyl alcohol	EC50 2 mg/l 48 hr Daphnia magna
Polyoxyethylene (20) sorbitan monooleate	LC50 13188.484 mg/l 48 hr

Avian

Guanidine chloride	No Information
Ethyl alcohol	No Information
Polyoxyethylene (20) sorbitan monooleate	EC50 62.072 mg/l 96 hr

B. Persistency and Degradability

Persistency

Guanidine chloride	No Information
Ethyl alcohol	No Information
Polyoxyethylene (20) sorbitan monooleate	log Kow 0.70

Degradability

Guanidine chloride	No Information
Ethyl alcohol	BOD5/COD 0.57
Polyoxyethylene (20) sorbitan monooleate	No Information

C. Bioconcentration

Concentration

Guanidine chloride	No Information
Ethyl alcohol	No Information
Polyoxyethylene (20) sorbitan monooleate	BCF 3.162

Biodegradability

Guanidine chloride	(Active sludge, domestic sewage)
Ethyl alcohol	75 (%) 20 day (Aerobic, other, easily degraded)
Polyoxyethylene (20) sorbitan monooleate	No Information

D. Soil Mobility

Guanidine chloride	No Information
Ethyl alcohol	No Information
Polyoxyethylene (20) sorbitan monooleate	No Information

E. Other Toxic Effects

Guanidine chloride	No Information
Ethyl alcohol	No Information
Polyoxyethylene (20) sorbitan monooleate	No Information

13. Disposal Information

A. Disposal Method

Guanidine chloride	1) If possible, pre-separate oil and water.
Ethyl alcohol	1) If possible, pre-separate oil and water.
Polyoxyethylene (20) sorbitan monooleate	1) If possible, pre-separate oil and water.

B. Disposal Considerations

Guanidine chloride	Observe all local and national environmental regulations if applicable.
Ethyl alcohol	Observe all local and national environmental regulations if applicable.
Polyoxyethylene (20) sorbitan monooleate	Observe all local and national environmental regulations if applicable.

14. Transport Information

A. UN No.

Guanidine chloride	No classification information
Ethyl alcohol	1170
Polyoxyethylene (20) sorbitan monooleate	No classification information

B. Proper Shipping Name

Guanidine chloride	Not Applicable
Ethyl alcohol	ETHANOL(ETHYL ALCOHOL) or ETHANOL SOLUTION(ETHYL ALCOHOL SOLUTION)
Polyoxyethylene (20) sorbitan monooleate	Not Applicable

C. Shipping Hazard Classification

Guanidine chloride	Not Applicable
Ethyl alcohol	3
Polyoxyethylene (20) sorbitan monooleate	Not Applicable

D. Container Classification

Guanidine chloride	Not Applicable
Ethyl alcohol	2
Polyoxyethylene (20) sorbitan monooleate	Not Applicable

E. Marine Pollutant

Guanidine chloride	No Information
Ethyl alcohol	No Information
Polyoxyethylene (20) sorbitan monooleate	No Information

F. Special Safety Measures for Users Regarding Shipping or Shipping Measures

Fire Emergency Measures

Guanidine chloride	Not Applicable
Ethyl alcohol	F-E
Polyoxyethylene (20) sorbitan monooleate	Not Applicable

Release Emergency Measures

Guanidine chloride	Not Applicable
Ethyl alcohol	S-D
Polyoxyethylene (20) sorbitan monooleate	Not Applicable

15. Regulatory Status

Guanidine chloride	Managed chemical
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	Work environment measurement chemical (Measurement period : 6 mo.)
Ethyl alcohol	Exposure limited chemical
Polyoxyethylene (20) sorbitan monooleate	No Information
A. Industrial Safety and Health Regulation	
Guanidine chloride	No Information
Ethyl alcohol	No Information
Polyoxyethylene (20) sorbitan monooleate	No Information
B. Hazardous Chemical Management Regulation	
Guanidine chloride	No Information
Ethyl alcohol	Type 4 Alcohols 400ℓ
Polyoxyethylene (20) sorbitan monooleate	No Information
C. Dangerous Material Management Regulation	
Guanidine chloride	Designated waste
Ethyl alcohol	Designated waste
Polyoxyethylene (20) sorbitan monooleate	Designated waste
D. Waste Management Regulation	
E. Other Domestic and International Regulations	
Domestic Regulation	
Guanidine chloride	Not Applicable
Ethyl alcohol	Not Applicable
Polyoxyethylene (20) sorbitan monooleate	Not Applicable
Residual Organic Contaminant Management Regulation	
International Regulations	
Guanidine chloride	Not Applicable
Ethyl alcohol	Not Applicable
Polyoxyethylene (20) sorbitan monooleate	Not Applicable
OSHA Regulation	
Guanidine chloride	Not Applicable
Ethyl alcohol	Not Applicable
Polyoxyethylene (20) sorbitan monooleate	Not Applicable
CERCLA Regulation	
Guanidine chloride	Not Applicable
Ethyl alcohol	Not Applicable
Polyoxyethylene (20) sorbitan monooleate	Not Applicable
EPCRA 302 Regulation	
Guanidine chloride	Not Applicable
Ethyl alcohol	Not Applicable
Polyoxyethylene (20) sorbitan monooleate	Not Applicable
EPCRA 304 Regulation	
Guanidine chloride	Not Applicable
Ethyl alcohol	Not Applicable
Polyoxyethylene (20) sorbitan monooleate	Not Applicable
EPCRA 313 Regulation	
Guanidine chloride	Not Applicable
Ethyl alcohol	Not Applicable
Polyoxyethylene (20) sorbitan monooleate	Not Applicable
Rotterdam Convention Substance	
Guanidine chloride	Not Applicable

Ethyl alcohol	Not Applicable
Polyoxyethylene (20) sorbitan monooleate	Not Applicable
Stockholm Convention Substance	
Guanidine chloride	Not Applicable
Ethyl alcohol	Not Applicable
Polyoxyethylene (20) sorbitan monooleate	Not Applicable
Montreal Protocol Substance	
Guanidine chloride	Xn; R22Xi; R36/38
Ethyl alcohol	F; R11
Polyoxyethylene (20) sorbitan monooleate	Not Applicable
EU Classification (Confirmed Classification Result)	
Guanidine chloride	R22, R36/38
Ethyl alcohol	R11
Polyoxyethylene (20) sorbitan monooleate	Not Applicable
EU Classification (Risk Phrases)	
Guanidine chloride	S2, S22
Ethyl alcohol	S2, S7, S16
Polyoxyethylene (20) sorbitan monooleate	Not Applicable

EU Classification (Safety Phrases)

16. Other References

A. Source of Information

Guanidine chloride

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

ECB-ESIS(European chemical Substances Information System)(<http://ecb.jrc.it/esis>)

ECOTOX Database, EPA(<http://cfpub.epa.gov/ecotox>)

IUCLID Chemical Data Sheet, EC-ECB

International Chemical Safety Cards(ICSC)(<http://www.nihs.go.jp/ICSC>)

TOXNET, U.S. National Library of Medicine(<http://toxnet.nlm.nih.gov>)

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

Korea dangerous material inventory management system, National Emergency Management Agency
(<http://www.nema.go.kr/hazmat/>)

National Chemical Information Portal, National Institute of Environmental Research(<http://ncis.nier.go.kr>)

Ethyl alcohol

HSDB(Form)

HSDB(Color)

HSDB(B.Odor)

HSDB(C. Threshold odor)

HSDB(E. Freezing/Melting Point)

HSDB(F.Boiling Point and Range)

HSDB(G. Flash point)

ICSC(H. Ignition or Explosion Range (Upper/Lower))

HSDB(K. Vapor Pressure)

HSDB(L. Solubility)

HSDB(M. Vapor density)

ICSC(N. Specific Weight)

HSDB(O. n-Octanol/Water Solubility Coefficient)
HSDB(P. Self-Flammability)
HSDB(R. Viscosity)
HSDB(S. Molecular Weight)
ECOTOX(Fish)
ECOTOX(Crustacean)
IUCLID(resolvability)
IUCLID(Biodegradability)
HSDB(D. Soil Mobility)
ECB-ESIS(European chemical Substances Information System)(<http://ecb.jrc.it/esis>)
ECOTOX Database, EPA(<http://cfpub.epa.gov/ecotox>)
HSDB, U.S. National Library of Medicine(<http://toxnet.nlm.nih.gov>)
IUCLID Chemical Data Sheet, EC-ECB
International Chemical Safety Cards(ICSC)
Korea dangerous material inventory management system, National Emergency Management Agency
(<http://www.nema.go.kr/hazmat/>)

Polyoxyethylene (20) sorbitan monooleate

(MERCK)(Color)
(MERCK)(D. pH)
(Korea Occupational Safety and Health Agency)(M. Vapor density)
(MERCK)(S. Molecular Weight)
(MERCK)(R. Viscosity)
(TOMES;RTECS)(Oral)
(TOMES;RTECS)(Severe Eye Damage or Irritation)
ECOSAR(Fish)
ECOSAR(Crustacean)
ECOSAR(Avian)
Ecological Structure Activity Relationships(ECOSAR)(Persistency)
Ecological Structure Activity Relationships(ECOSAR)(Concentration)

B. Initial Issue Date 2010-11-29

C. Revision Count and Latest Revision Date

Revision Count 0

Latest Revision Date 0

D. Other

This Material Safety Data Sheet (MSDS) is based on, edited and partially modified from a MSDS obtained from the Korean Occupational Safety & Health Agency.

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