

Safety Data Sheet

Prepared: April 4, 2017

1. Product and Company Information

Product name : GenCheck DNA Extraction kit [Type S/F]
 Product code : GC002-1N
 Kit configuration (1) Lysis Solution M
 (2) Lysis Solution S
 (3) Purification Solution
 (4) Wash Solution 1
 (5) Wash Solution 2
 (6) TE (pH8.0)
 (7) RNase A
 (8) Beads Tube
 (9) Spin Column

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2. Summary of Hazards

(2) Description of Lysis Solution S: SDS (Sodium dodecyl sulfate)

GHS classification: Skin corrosion resistance and irritation : Category 2
 Serious damage and irritation to the eyes : Category 2
 Specific target organ toxicity - Single exposure : Category 3 (respiratory tract irritation)
 Specific target organ toxicity - Repeated exposure : Category 2 (kidney)
 Hazard to aquatic environment - Acute hazard : Category 2

GHS label elements
 Alert statement



Hazard information : H315 Skin irritation
 H319 Serious eye irritation
 H335 May cause respiratory irritation
 H373 May cause damage to the kidney through prolonged or repeated exposure
 H401 Toxic to aquatic life

Notes [Safety measures] P280 Wear protective gloves, eye protection, and face protection.
 P264 Wash hands thoroughly after handling.
 P261 Avoid inhaling fume, steam, and spray
 P271 Use only outdoors or in a well-ventilated area.
 P273 Avoid release to the environment.

[FIRST AID MEASURES] P314 Get medical advice/attention if you feel unwell.
 P362 Take off the contaminated clothing and wash before reuse.
 P302+P352 IF ON SKIN: Wash with plenty of soap and water.
 P304 + P340 IF INHALED: Move victim to fresh air and keep at rest in a position comfortable for breathing.
 P332 + P313 If skin irritation occurs: Get medical advice/attention.
 P337 + P313 If eye irritation persists: Get medical advice/attention.
 P305 + P351 + P338 IF IN EYES: Rinse carefully with water for several minutes when adhered to eyes. If wearing contact lenses, remove at once and continue rinsing.

[Storage] P405 Store locked up.
 P403 + P233 Store in a well-ventilated place. Keep the container tightly closed.

[Disposal] P501 Outsource disposal of content or container to a waste disposal contractor licensed by the prefectural governor.

(3) Description of Purification Solution (Cetyltrimethylammonium bromide)

GHS classification : Germ cell mutagenicity : Category 2
 Reproductive toxicity : Category 2
 Specific target organ toxicity with single exposure : Category 2 (heart, blood system)
 Hazard to aquatic environment - Acute hazard : Category 1
 Hazard to aquatic environment - Chronic hazard : Category 1

GHS label elements
 Alert statement



Danger

Hazard information : H341 Suspected of causing genetic defects.
 H361 Suspected of damaging fertility or the unborn child.
 H371 May cause damage to heart and blood system
 H400 Very toxic to aquatic life.
 H410 Very toxic to aquatic life with long lasting effects.

Notes [Safety measures]

P201 Obtain special instructions before use.
 P202 Do not handle until all safety precautions have been read and understood.
 P260 Do not inhale mist, vapors, and spray.
 P264 Wash hands thoroughly after handling.
 P270 Do not eat, drink, or smoke when using this product.
 P281 Use specified personal protective equipment.
 P273 Avoid release to the environment.

[FIRST AID MEASURES] advice/attention.

P308 + P313 IF exposed or concerned of exposure: Get medical advice/attention.
 P309 + P311 IF exposed or if you feel unwell: Call a POISON CENTER or doctor/physician.

[Storage]

P391 Collect spillage.

[Disposal]

P405 Store locked up.

licensed by the prefectural governor.

P501 Outsource disposal of content or container to a waste disposal contractor

(4) Description of Wash Solution 1

GHS Classification : Acute toxicity, oral : Category 4
 Skin corrosion resistance and irritation : Category 2
 Serious damage and irritation to the eyes : Category 2A

GHS label elements

Alert statement



Warning

Hazard information : H302 Harmful if swallowed.
 H315 Skin irritation
 H319 Serious eye irritation

Notes [Safety measures]

P264 Wash hands thoroughly after handling.
 P270 Do not eat, drink, or smoke when using this product.
 P280 Wear protective gloves, protective clothing, eye protection, and face protection.

[FIRST AID MEASURES]

P362 IF ON SKIN: Take off contaminated clothing and wash before reuse.
 P302+P352 IF ON SKIN: Wash with plenty of soap and water.
 P332 + P313 If skin irritation occurs: Get medical advice/attention.
 P305 + P351 + P338 IF IN EYES: Rinse carefully with water for several minutes when adhered to eyes. If wearing contact lenses, remove at once and continue rinsing.
 P337 + P313 If eye irritation persists: Get medical advice/attention.
 P330 Rinse mouth when swallowed.

[Disposal]

P301 + P312 IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.

P501 Outsource disposal of content or container to a waste disposal contractor licensed by the prefectural governor.

(5) Description of Wash Solution 2 (Ethanol)

GHS Classification	: Flammable liquid	: Category 2
	Serious damage and irritation to the eyes	: Category 2B
	Carcinogenicity	: Category 1A
	Reproductive toxicity	: Category 1A
	Specific target organ toxicity - Single exposure (irritation, anesthetic action)	: Category 3 (respiratory tract)
	Specific target organ toxicity - Repeated exposure (central nervous system)	: Category 1 (liver) Category 2

GHS label elements

Alert statement

**Danger**

Hazard information

:	H225 Highly flammable liquid and vapor
	H320 Eye irritation
	H350 May cause cancer
	H360 May damage fertility or the unborn child
	H335 May cause respiratory irritation
	H336 May cause drowsiness or dizziness
	H372 Causes damage to organs through prolonged or repeated exposure
	H373 May cause damage to organs through prolonged or repeated exposure
Notes [Safety measures]	P201 Obtain special instructions before use.
	P202 Do not handle until all safety precautions have been read and understood.
	P210 Keep away from ignition sources such as heat, sparks, open flames, and high temperature objects. - Non-smoking.
	P233 Keep container tightly closed.
	P240 Ground/bond container and receiving equipment when reloading electrostatically sensitive materials.
	P241 Explosion-proof electrical equipment, ventilation equipment, and lighting equipment must be used.
	P242 Use only non-sparking tools.
	P243 Take precautionary measures against static discharge.
	P260 Do not inhale mist, vapors, and 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 appropriate protective gloves, eye protection, and face protection.
	P281 Use specified personal protective equipment.
[FIRST AID MEASURES]	P312 Call a POISON CENTER or doctor/physician if you feel unwell.
	P314 Get medical advice/attention if you feel unwell.
	P304 + P340 IF INHALED: Move victim to fresh air and keep at rest in a position comfortable for breathing.
	P308 + P313 IF exposed or concerned of exposure: Get medical advice/attention.
	P337 + P313 If eye irritation persists: Get medical advice/attention.
	P370 + P378 In case of fire: Use the appropriate fire extinguishing method.
	P303 + P361 + P353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Wash the skin with water or shower.
	P305 + P351 + P338 IF IN EYES: Rinse carefully with water for several minutes when adhered to eyes. If wearing contact lenses, remove at once and continue rinsing.
[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 Outsource disposal of content or container to a waste disposal contractor licensed by the prefectural governor.

(8) Description of Beads Tubes (Zirconium oxide sintered body)

GHS classification	: Excluded
GHS label elements	: Excluded
Alert statement	: None
Hazard information	: None
Notes	: None

For the hazards not described, classification is either excluded or cannot be classified.

3. Composition and Ingredient Information

(1) Lysis Solution M		
Chemical compounds, mixture distinction	Mixture	
Chemical name or generic name	Trade secret	
Concentration	Not disclosed	
Chemical properties (chemical formula)	Not disclosed	
CAS number	Not disclosed	
Official Gazette published docket number	Not disclosed	
Hazardous components	None	
(2) Lysis Solution S		
Chemical compounds, mixture distinction	Mixture	
Chemical name or generic name	Sodium dodecyl sulfate	Trade secret
Concentration	20%	Not disclosed
Chemical properties (chemical formula)	C ₁₂ H ₂₅ SO ₄ Na	Not disclosed
CAS number	151-21-3	Not disclosed
Official Gazette published docket number	2-1679	Not disclosed
Hazardous ingredient	Sodium dodecyl sulfate	None
(3) Purification Solution		
Chemical compounds, mixture distinction	Mixture	
Chemical name or generic name	Trade secret	Cetyltrimethylammonium
bromide (CTAB)		
Concentration	Not disclosed	5%
Chemical properties (chemical formula)		Not disclosed C ₁₉ H ₄₂ BrN
CAS number	Not disclosed	57-09-0
Official Gazette published docket number		Not disclosed 2-184, 9-795
Hazardous components	None	CTAB
(4) Wash Solution 1		
Chemical compounds, mixture distinction	Mixture	
Chemical name or generic name	Trade secret	Trade secret
Concentration	>80%	Not disclosed
Chemical properties (chemical formula)		Not disclosed Not disclosed
CAS number	Not disclosed	Not disclosed
Official Gazette published docket number		Not disclosed Not disclosed
Hazardous components	Not disclosed	None
(5) Wash Solution 2		
Chemical compounds, mixture distinction	Mixture	
Chemical name or generic name	Ethanol	Trade secret
Concentration	70%	Not disclosed
Chemical properties (chemical formula)	C ₂ H ₆ O	Not disclosed
CAS number	64-17-5	Not disclosed
Official Gazette published docket number	2-202	Not disclosed
Hazardous components	Ethanol	None
(6) TE (pH8.0)		
Chemical compounds, mixture distinction	Mixture	
Chemical name or generic name	Tris-HCl (pH8.0)	EDTA (pH8.0)
Concentration	10mM	1mM
Chemical properties (chemical formula)	No data	No data
CAS number	Not specified	Not specified
Official Gazette published docket number	Not specified	Not specified
Hazardous components	None	None
(7) RNase A		
Single product, mixture distinction	Mixture	
Chemical name or generic name	RNase A Solution	
Concentration	100 mg/ml	
Chemical properties (chemical formula)	No data	

CAS number	Not specified		
Official Gazette published docket number	Not specified		
Hazardous components	None		
(8) Beads Tube			
Chemical compounds, mixture distinction	Mixture		
Chemical name or generic name	Zirconium oxide	Yttrium Oxide	Hafnium
Concentration	90 to 96%	3 to 7%	1 to 3%
Chemical properties (chemical formula)	ZrO ₂	Y ₂ O ₃	HfO ₂
CAS number	1314-23-4	1314-36-9	12055-23-1
Official Gazette published docket number	1-563	1-560	1-737
Hazardous components	Zirconium oxide	Yttrium oxide	Hafnium

4. First Aid Measures

Description of (1), (6), and (7)

- IF INHALED** : Move victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell.
- IF ON SKIN** : Wash with plenty of soap and water. Get medical advice/attention in case of irritation.
- IF IN EYES** : Rinse with water for 15 minutes or more.
If there is a problem, get medical attention/advice.
- When swallowed** : Rinse mouth with water. Call a POISON CENTER or doctor/physician if you feel unwell.
- The most important acute and delayed symptoms that are expected** : No Data

(2) Description of Lysis Solution S: SDS (Sodium dodecyl sulfate)

- IF INHALED**: Move victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell.
- IF ON SKIN**: Take off all contaminated clothing immediately.
Wash the skin with plenty of water or take a shower. Contact a doctor/physician.
- IF IN EYES**: Rinse carefully with water for several minutes when adhered to eyes. If wearing contact lenses, remove at once and continue rinsing.
Contact a doctor/physician.
- When swallowed**: Rinse mouth with water. Contact a doctor/physician.
- Expected acute and delayed symptoms**
- | | | |
|-------------------------|---|--------------------------------|
| Inhalation | : | Sore throat, cough |
| Skin | : | Redness |
| Eyes | : | Redness, and pain |
| Ingestion | : | Nausea, vomiting, and diarrhea |
| Most important symptoms | : | May cause dermatitis. |

(3) Description of Purification Solution (Cetyltrimethylammonium bromide)

- IF INHALED** : Remove the victim to fresh air and keep at rest in a position comfortable for breathing.
Get medical attention and diagnosis.
- IF ON SKIN** : Wash with plenty of soap and water until the chemicals are removed.
Get medical attention and diagnosis.
If skin irritation occurs: Get medical advice/attention.
Take off all contaminated clothing.
Wash the contaminated clothing before reuse.
- IF IN EYES** : Rinse carefully with water for several minutes when adhered to eyes. If wearing contact lenses, remove at once and continue rinsing.
If eye irritation persists: Get medical advice/attention.
- When swallowed**: Rinse mouth with water. Get medical attention and diagnosis.
- The most important acute and delayed symptoms that are expected** : No Data

(4) Description of Wash Solution 1

- IF INHALED** : Move victim to fresh air and keep at rest in a position comfortable for breathing.
Get medical attention and diagnosis.
- IF ON SKIN** : Take off all contaminated clothing. Quickly wash with plenty of soap and water.
Wash the contaminated clothing before reuse.
Get medical advice/attention.

IF IN EYES	: Rinse carefully with water for several minutes when adhered to eyes. If wearing contact lenses, remove at once and continue rinsing. If eye irritation persists: Get medical advice/attention.
When swallowed	: Rinse mouth with water. Do NOT induce vomiting. Get medical attention and diagnosis.
The most important acute and delayed symptoms that are expected	: No Data
(5) Description of Wash Solution 2 (Ethanol)	
IF INHALED	: Move victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell.
IF ON SKIN	: Take off all contaminated clothing immediately. Wash the skin with water or shower. In the case of skin irritation, get medical advice/attention.
IF IN EYES	: Rinse carefully with water for several minutes when adhered to eyes. If wearing contact lenses, remove at once and continue rinsing. If eye irritation persists: Get medical advice/attention.
When swallowed	: Rinse mouth immediately, and get doctor's/physician's advice.
Expected acute and delayed symptoms	
Inhalation	: Cough, headache, fatigue, and drowsiness
Skin	: Dryness of skin
Eyes	: Redness, pain, and burning sensation
Ingestion	: Burning sensation, headache, confusion, dizziness, and loss of consciousness
Most important symptoms	: May affect the central nervous system. Stimulus, headache, fatigue and lack of concentration may be caused. Ingesting ethanol during pregnancy may have a harmful effect on unborn babies. Long term ingestion can cause cirrhosis of the liver

5. Measures in case of a Fire

Extinguishing agents	: Water spray, fire extinguishing foam, dry powder, carbon dioxide, dry sand, and alcohol-resistant foam (8): An extinguishing agent that is suitable for the surrounding fire must be used because the product is non-flammable.
Extinguishing agent that should not be used fire	: (4), (5): Water should not be sprayed directly towards the source of fire
Specific hazards during a fire	: Since fires can cause irritation or release harmful gases, appropriate protective equipment should be worn so as not to inhale the smoke. (5): Very flammable, and can be easily ignited by heat, spark, and flame The container may explode when heated. The fire may cause irritation, and release toxic or corrosive gases. Highly flammable liquid and vapor
Special methods to extinguish the fire	: Move the containers from the vicinity of the fire if there is no danger. Cut-off all combustion sources of the fire, and extinguish the fire with an appropriate extinguishing agent. As far as possible, carry out fire extinguishing activities from the windward direction. Take appropriate measures to prevent substances that affect the environment from flowing out due to the water that is sprayed to extinguish the fire. (5): If there is a risk of fire spreading by spraying water, then use an appropriate extinguishing agent that is different from among the ones given above instead of spraying water. Extremely low flash point: Use a water spray to extinguish large fires that cannot be extinguished by other fire extinguishing agents. Move the containers from the vicinity of the fire if there is no danger. If the containers cannot be moved, then cool the containers and surroundings by spraying water. Even after extinguishing the fire, cool the containers sufficiently using a large quantity of water.
Protection for firefighters	: When extinguishing the fire, firefighters should wear appropriate breathing equipment and protective clothing for chemicals. (5): Fire extinguishing activities should be performed from the windward direction and avoid inhalation of harmful gases. Respiratory protection equipment should be worn depending on the situation.

6. Measures in case of Accidental Release

Precautions for human body, protective equipment, and emergency procedures	: Workers should wear appropriate protective equipment (See section "8. Exposure Prevention and Protection Measures"), and
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	avoid contact with eye and skin, and inhalation of gases. Setup a 360° perimeter at an appropriate distance from the spillage area as the isolation zone. Do not touch damaged containers or spillage without wearing the appropriate protective clothing. Entry of non-authorized personnel must be prohibited. Stay in the windward direction. Keep away from low-lying areas. Ventilate any closed spaces before entering.
Environmental precautions	: (2), (3), (4), and (8): Should not be released into the environment.
Containment and clean-up methods and materials	: The spilled liquid must be recovered as far as possible using waste cloth and rags, and the spillage area should be completely wiped. (5): Absorb using dry soil, sand, and noncombustible materials, or collect in an empty container that can be covered and sealed. When collecting the absorbed spillage, use clean antistatic tools.

7. Precautions for Handling and Storage

Handling	
Technical measures	: Perform measures for the equipment described in “8. Exposure Prevention and Protection Measures”, and wear protective equipment.
Local and general ventilation	: Provide local and general ventilation described in “8. Exposure Prevention and Protection Measures”.
Precautions for safe handling	: Do not cause impact by rough handling such as overturning, dropping or dragging of the containers. Ensure that there is no leakage, overflow, or scattering. Seal the containers after use. Wear appropriate protective equipment. After handling, wash hand and face with plenty of water, and gargle. Eating food and smoking should be restricted to specified locations. Entry to handling areas must be limited to concerned personnel only. (5): Leakage and vaporization of the liquid should be prevented as much as possible. Do not cause impact by overturning, dropping or dragging the containers. Should not be touched, inhaled, or swallowed. Do not eat, drink, or smoke when using this product. Wash hands thoroughly after handling. Do not inhale, vapor, mist, and spray. Avoid contact with skin. Should not get into the eyes. Obtain instruction manual before use. Do not handle until all safety precautions have been read and understood. Prohibit use of high temperature, spark, or fire in the surrounding area.
Contact avoidance	: Described in “10. Stability and Reactivity”
Storage	
Appropriate storage conditions	: Store between 2 to 10°C. Must be stored in a well-ventilated place. Avoid direct sunlight. Store by keeping away from ignition sources such as heat, sparks, and open flames. - Non-smoking. Store away from oxidizing agents. Store keeping the container tightly closed. Must be stored under lock and key.
Technical measures	: (5): Fires are strictly prohibited
Incompatible materials	: Described in “10. Stability and Reactivity”
Safe container packing materials	: High-Density Polyethylene, Polypropylene

8. Exposure Prevention and Protection Measures

Allowable concentration ACGIH (TLV)	:	Not set
Japan Society for Occupational Health	:	Not set
Facility measures	:	The source should be sealed, and a local exhaust ventilating system should be installed if vapor or mist is generated.

Protective equipment	
Respiratory protection	: Protective mask
Hand protection	: Protective gloves
Eye protection	: Protective goggles
Protection for skin and body	: Wear work clothes with long sleeves

9. Physical and Chemical properties

Appearance (physical state, shape, and color)	: Transparent colorless liquid (8): White powder (9): White solid
Odor	: Odorless (3): Acetic acid odor (5): Ethanol odor
pH	: No data (6): pH 8.0
Freezing point, solidifying point	: No Data
Boiling point, initial boiling point and boiling range	: No data
Ignition point	: No Data
Combustion or explosion range (upper /lower limit)	: No data
Vapor pressure	: No Data
Specific gravity	: No Data
Solubility	: Miscible in water (8), (9): Insoluble
n- octanol/water partition coefficient	: No Data
Spontaneous ignition temperature	: No Data
Decomposition temperature	: No Data

10. Stability and Reactivity

Reactivity	: No Data
Chemical stability	: Can be considered as stable when stored and handled in accordance with the regulations.
Possibility of hazardous reactions	: (2): Produces toxic and corrosive gases such as carbon monoxide and sulfur oxide due to decomposition on burning. The product reacts with strong oxidants and strong acids. (5): Can form explosive peroxides in the air. Gradually reacts with calcium hypochlorite, silver oxide, and ammonia, posing a risk of fire or explosion. Reacts intensely with oxidizing agents such as nitric acid, silver nitrate, mercuric sulfate, and magnesium perchlorate, posing a risk of fire and explosion. The product harms particular type of plastic, rubber, and coatings.
Conditions to avoid	: Sunlight, heat (5): Exposure to high temperature
Incompatible materials	: (2): Strong oxidizing agents and strong acids (4): Strong oxidizing agents, calcium hypochlorite, silver oxide, and ammonia
Hazardous decomposition products	: Carbon monoxide, and carbon dioxide (2): Produces toxic and corrosive gases including carbon monoxide and sulfur oxide.

11. Toxicological Information

Description of Sodium dodecyl sulfate	
Acute toxicity	: Oral Rat LD ₅₀ : 1200 mg/kg Content: 20% LD ₅₀ : 6000 mg/kg Not classified : Skin Rabbit LD ₅₀ : 580 mg/kg Content: 20% LD ₅₀ : 2900 mg/kg Not classified : Inhalation No Data
Skin corrosion and irritation	: Skin irritation and corrosion studies using rabbits (OECD TG 404, GLP) PII: 6.0, 6.78 "highly irritating". Classified as Category 2 because there is no description on recovery
Serious damage or irritation to the eyes	: Eye irritation and corrosion studies in rabbits (OECD TG 405, GLP) "Modified Maximum Average Scores: 16.00; moderately irritating, 59.17; irritating, 60.50; irritating". Classified as Category 2
Respiratory or skin sensitization	: Respiratory sensitization : No data : Skin sensitization : Maximization studies using a guinea pig: Negative Not classified
Germ cell mutagenicity	: Micronucleus test of germ cells in vivo mutagenicity studies: Negative Not classified
Carcinogenicity	: No Data

Reproductive toxicity	: No Data
Specific target organ toxicity - Single exposure	: Respiratory tract irritation was observed with aerosol exposure in mouse, rabbit, and guinea pigs. Respiratory tract irritation was observed with short-term exposure. Classified as Category 3 (respiratory tract irritation)
Specific target organ toxicity- Repeated exposure:	There is a description "Vacuolar degeneration of epithelial cells in renal tubules and atrophy of renal glomeruli observed" in the 2-week feeding studies conducted using rats. Classified as Category 2 (kidney)
Aspiration hazard	: No Data
Description of CTAB	
Acute toxicity	: Oral Rat LD ₅₀ : 410 mg/kg Content: 5% LD ₅₀ : 8200 mg/kg Not classified : Skin No Data : Inhalation No Data
Skin corrosion and irritation	: Mice 30 minutes, 1 hour and 2-hour application studies "Irritation of moderate degree" Classified as Category 2 Not classified as the content is less than 10%
Serious damage or irritation to the eyes	: Eye irritation studies using rabbits "Severe irritation". Classified as Category 2A Not classified as the content is less than 10%
Respiratory sensitization or skin sensitization	: No data
Germ cell mutagenicity	: Somatic cell in vivo mutagenicity studies (chromosomal aberration test): Negative. Classified as Category 2
Carcinogenicity	: No Data
Reproductive toxicity	: With teratogenicity studies in mice and rats, reduction in the live born number and survival rate 3 days after birth with a dose where the parent animal develops general toxicity was observed. Classified as Category 2
Specific target organ toxicity - Single exposure	: Description of "Unstable blood pressure, cardiac ischemia, and methemoglobinemia" for humans Damage to heart and blood system. Classified as Category 1. Since content is > 1% and < 10%. Classified as Category 2
Specific target organ toxicity - Repeated exposure	: No data
Aspiration hazard	: No Data
Description of Wash Solution 1	
Acute toxicity	: Oral Rat LD ₅₀ : < 2000 mg/kg : Category 4 Skin No Data Inhalation Rat LC ₅₀ > 5 mg/L : Not classified
Skin corrosion and irritation	: Studies using rabbits, highly irritating : Category 2
Serious damage or irritation to the eyes	: Studies using rabbits, irritating : Category 2A
Respiratory sensitization or skin sensitization	: No data
Germ cell mutagenicity	: No Data
Carcinogenicity	: No Data
Reproductive toxicity	: No Data
Specific target organ toxicity - Single exposure	: No data
Specific target organ toxicity - Repeated exposure	: No data
Aspiration hazard	: No Data
Description of ethanol	
Acute toxicity:	Oral Rat LD ₅₀ = 6200 - 15000 mg/kg : Not classified Skin Rabbit LDLo = 20,000 mg/kg bw : Not classified Inhalation (vapors) Rat LC ₅₀ = 20,661 ppmV (4h): Not classified
Skin corrosion resistance and irritation	: Rabbit exposure studies (OECD TG 404), not irritating, Not classified
Serious damage or irritation to the eyes	: Rabbit Draize studies (OECD TG405), moderate irritation, and there is almost complete recovery from the symptoms within 7 days. Classified as Category 2B
Respiratory sensitization or skin sensitization	: No data
Germ cell mutagenicity	: Negative in standard in vivo and in vitro mutagenicity studies: Not classified
Carcinogenicity: ACGIH: A3 IARC	: Ingestion of ethanol and its metabolite acetaldehyde induces malignant tumors in the esophagus. Classified as Category 1A
Reproductive toxicity	: Drinking above a certain amount causes miscarriages or increases the risk of miscarriage. Habitual drinking of pregnant women Alcohol causes fetal growth suppression, microcephaly, characteristic facial features, and mental disorders. Classified as

Specific target organ toxicity - Single exposure	Category 1A : Stupor, drowsiness, and mild paralysis were observed in human inhalation exposure studies. Classified as Category 3 (anesthetic action) Inhalation exposure of the test substance vapor in humans causes irritation to the eyes and upper respiratory tract even at low concentrations. Classified as Category 3 (respiratory tract irritation)
Specific target organ toxicity - Repeated exposure:	High intake of alcohol by humans over an extended period adversely affects almost all organs, but the organ that is most affected is the liver. The failure starts with fatty degeneration, progresses through the stages of necrosis and fibrosis to cirrhosis of the liver. Classified as Category 1 (liver) Patients with severe dependence due to alcohol intake are mentioned as having withdrawal symptoms such as tremor, convulsions, and delirium accompanied by frequent nausea, weakness, anxiety, perspiration, intentional behavior to obtain alcohol, and prominent hyperreflexia. Classified as Category 2 (central nervous system)
Aspiration hazard	: No Data

12. Ecological Information

Description of Sodium dodecyl sulfate Ecotoxicity: Crustaceans (American lobster)	: LC ₅₀ = 0.72 mg/L /96H LC ₅₀ = 4mg/L /96H as the content is 20%. Hazard to aquatic environment - Acute hazard was classified as Category 2.
Persistence and degradability	: Rapid degradation. Bioaccumulation: No bioaccumulation (LogKow = 1.6) Rapid degradation and since bioaccumulation property is presumed not to exist, hazard to the aquatic environment was not classified.
Mobility in soil Harm to ozone layer Other adverse effects	: No data : No data : No data
Description of CTAB Ecotoxicity	: blue-green algae (microcystis) : EC ₅₀ = 0.03mg/L /96H EC ₅₀ = 0.50 mg/L /96H as the content is 5%. Hazard to aquatic environment - Acute hazard was classified as Category 1.
Persistence and degradability Bioaccumulation	: No rapid degradation (degradation index due to BOD: 0%) : Bioaccumulation (BCF = 741) takes place Since EC ₅₀ ≥ 1mg/L, and BCF > 500 or more, hazard to aquatic environment was classified as Category 1.
Mobility in soil Harm to ozone layer Other adverse effects	: No data : No data : No data
Description of Wash Solution 1 Ecotoxicity Persistence and degradability Bioaccumulation Mobility in soil Harm to ozone layer Other adverse effects	: No Data : No data : No Data : No data : No data : No data
Description of ethanol Ecological toxicity	: Fish (fathead minnow) LC50 > 100mg/L /96H (SIDS, 2005) Hazard to aquatic environment - Acute hazard was not classified.
Persistence and degradability Ecological accumulation	: Resolution: 89% by BOD (J-CHECK) : Water solubility is good (water solubility = 1.00 ×106mg/L (PHYSPROP Database, 2005)) Hazard to the aquatic environment was not classified because decomposition is high, water solubility is good, and ecotoxicity is low.
Mobility in soil Harm to ozone layer Other adverse effects	: No data : No data : No data

13. Disposal Considerations

Disposal of residue	: Follow the relevant regulations as well as the local government standards for disposal. Outsource disposal to a waste disposal contractor licensed by the prefectural governor or to the local government if they provide the service.
Contaminated containers and packing materials	: The containers must be cleaned and recycled or disposed based on the relevant regulations and local government standards. When disposing of empty containers, completely remove the contents before disposal.

14. Precautions for Transportation

UN number	: 1170
Product Name	: Ethanol or its solution Ethanol (Ethyl Alcohol) or Ethanol Solution (Ethyl Alcohol Solution)
Class	: 3
Container grade	: II
Marine pollutants	: Not applicable
International standards	
Land regulatory information	: In accordance with the provisions of ADR/RID.
Maritime regulatory information	: In accordance with the provisions of IMO.
Aviation regulations information	: In accordance with the provisions of ICAO/IATA.
Japan regulations	
Land regulatory information	: In accordance with the provisions of Fire Service Act.
Maritime regulatory information	: In accordance with the provisions of Ship Safety Act.
Aviation regulations information	: In accordance with the provisions of Civil Aeronautics Act.
Special safety measures	: During transport, direct sunlight, damage to the container, and corrosion should be avoided, and stacked such that there is no leakage. Food and feed should not be transported together with ethanol. Do not stack heavy objects. The yellow card must be retained during transfer.
Policy number for emergency first aid measures	: 127

15. Applicable Law

Description of Sodium dodecyl sulfate	
Fire Service Law	: Not applicable
Poisonous and Deleterious Substances Control Law	: Not applicable
Industrial Safety and Health Act	: Hazardous chemical compounds (Paragraph 14, Article 24 regulation) Specific hazardous chemicals (Paragraph 15, Article 24 regulation)
Law Promoting the Management of Chemical Substances (PRTR Law) No. 275	: Class I designated chemical substance
Description of Cetyltrimethylammonium bromide	
Fire Service Law	: Not applicable
Poisonous and Deleterious Substances Control Law	: Not applicable Industrial Safety and Health Act: Hazardous chemical compounds (Paragraph 14, Article 24 regulation) Specific hazardous chemicals (Paragraph 15, Article 24 regulation)
Law Promoting the Management of Chemical Substances (PRTR Law) substance No. 85	: Class II designated chemical
Description of Wash Solution 1 (undisclosed)	
Fire Service Law	: Not applicable
Poisonous and Deleterious Substances Control Law	: Not applicable Industrial Safety and Health Act: Hazardous chemical compounds (Paragraph 14, Article 24 regulation)

	Specific hazardous chemicals (Paragraph 15, Article 24 regulation)
Law Promoting the Management of Chemical Substances (PRTR Law)	: Not applicable
Description of Ethanol	
Fire Service Act	: Class 4 dangerous goods alcohols (water soluble) Danger grade 2
Poisonous and Deleterious Substances Control Law	: Not applicable
Industrial Safety and Health Act	: Hazardous chemical compounds (Paragraph 14, Article 24 regulation) Hazardous substance (Act, No. 2, Article 57; Enforcement ordinance, No. 2, Article 18) requiring notification of name No. 61 Appendix 1/4 Dangerous goods Flammable substances
Law Promoting the Management of Chemical Substances (PRTR Law)	: Not applicable
Description of Zirconium oxide sintered body	
Fire Service Law	: Not applicable
Poisonous and Deleterious Substances Control Law	: Not applicable
Industrial Safety and Health Act	: Zirconium oxide: No. 2, Article 57 (Ordinance No. 2, Article 18), hazardous substance requiring notification of name No. 313 Yttrium oxide: No. 2, Article 57 (Ordinance No. 2, Article 18), hazardous substance requiring notification of name No. 54 Hafnium: No. 2, Article 57 (Ordinance No. 2, Article 18), hazardous substance requiring notification of name No. 438
Law Promoting the Management of Chemical Substances (PRTR Law)	: Not applicable

16. Other Information

- Reference Chemical Risk Information Platform (CHRIP)
http://www.safe.nite.go.jp/japan/sougou/view/SystemTop_jp.faces
 Ministry of Health, Labour, and Welfare safety site
http://anzeninfo.mhlw.go.jp/anzen_pg/GHS_MSD_FND.aspx
 SDS provided by vendors supplying the reagents

* Since this data sheet is mainly for the general handling of the product as a reagent, explanations have not been provided with sufficient consideration to handling for non-reagent applications and large quantities.

The latest information has been described but does not cover all the information.

- * When new information is obtained, it may be added or corrected.
- * The values are given as reference information for safe handling and does not give any guarantee whatsoever.
- * To use in special conditions, safety measures based on the environment of the usage location are required to be implemented.