




SAFETY DATA SHEET

QuickGene-AutoS RNA Tissue Kit (AS-RT)

| Name of substance | Classification acc. to GHS | Pictograms |
|------------------------------|--|---|
| Lysis Buffer LRT-02 | Acute Tox. 4: H302 Skin Irrit. 2: H315 Eye Irrit. 2: H319 |  |
| Wash Buffer WRT-S1 | Flam. Liq. 2: H225 Eye Irrit. 2A: H319 Carc. 1A: H350 Repr. 1A: H360 STOT SE 3: H335, H336 STOT RE 1: H372 STOT RE 2: H373 |  |
| Solubilization Buffer SRT-02 | | |
| Elution Buffer CRT-S1 | | |
| Ethanol | Flam. Liq. 2: H225 Eye Irrit. 2B: H320 Carc. 1A: H350 Repr. 1A: H360 STOT SE 3: H335, H336 STOT RE 1: H372 STOT RE 2: H373 |  |

KURABO INDUSTRIES LTD.

Bio-Medical Department

| | |
|-------------------------|---|
| Address | Advanced Technology Center 2F 14-30 Shimokida-Cho, Neyagawa, Osaka 572-0823, Japan |
| Telephone Number | +81-72-820-3079 |
| FAX Number | +81-72-820-3095 |

Safety Data Sheet

1. Identification of the substance/mixture and of the company/undertaking

Product identifier:

Product name: Lysis Buffer
Product code: LRT-02
SDS NO: LRT02_JPE_1.1

Details of the supplier of the safety data sheet

Manufacturer/Supplier: KURABO INDUSTRIES LTD.
Address: Advanced Technology Center, 14-30 Shimokida-cho, Neyagawa, Osaka, 572-0823 JAPAN
Division: Bio-Medical department
Telephone number: +81-72-820-3079
FAX: +81-72-820-3095

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

Relevant identified uses of the product: Reagents for automated nucleic acid isolation system
Uses advised against: For research use only

2. Hazards identification

GHS classification and label elements of the product

Classification of the substance or mixture

HEALTH HAZARDS Acute toxicity Oral: Category 4
Skin corrosion/irritation: Category 2
Serious eye damage/eye irritation: Category 2

(Note) GHS classification without description: Not applicable/Out of classification/Not classifiable

Label elements



Signal word: Warning

HAZARD STATEMENT

H302 Harmful if swallowed
H315 Causes skin irritation
H319 Causes serious eye irritation

PRECAUTIONARY STATEMENT

Prevention

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

Response

P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P332 + P313 If skin irritation occurs: Get medical advice/attention.
P362 + P364 Take off contaminated clothing and wash it before reuse.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337 + P313 If eye irritation persists: Get medical advice/attention.
P330 Rinse mouth.
P301 + P312 IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.

Disposal

P501 Dispose of contents/container in accordance with local/national regulation.

3. Composition/information on ingredients

Mixture/Substance selection Mixture

| Ingredient name | Content(%) | CAS No. |
|-------------------------------------|------------|-----------|
| guanidinium thiocyanate | 30-40 | 50-01-1 |
| hydrochloride salts of aminoalcohol | 1-5 | - |
| Water | Balance | 7732-18-5 |

Note : The figures shown above are not the specifications of the product.
Generally chemical substances greater than 1% of the total are listed.

4. First-aid measures

Descriptions of first-aid measures
IF INHALED Rescuers should wear proper personal protective equipment suitable for situation. Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell.
IF ON SKIN (or hair) Remove contaminated clothing. Wash with plenty of soap and water. If skin irritation occurs: Get medical advice/attention.
IF IN EYES Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.
IF SWALLOWED Rinse mouth. Call a POISON CENTER or doctor/physician if you feel unwell.

5. Fire-fighting measures

Extinguishing media
Suitable extinguishing media Carbon dioxide, dry chemical and protein based foam.
Extinguishing media to avoid None.
Special fire fighting Keep personnel removed from and upwind of fire. Water runoff can damage the environment.
Procedures Dike and collect water used to fight fire Evacuate area and fight fire from a safe distance.
Protection of fire-fighters Wear adequate personal protective equipment.

6. Accidental release measures

Personnel precautions, protective equipment and emergency measures
 Wear adequate personal protective equipment, see Section 8 (Exposure Controls/Personal Protection)
Environmental precautions
 Prevent from entering into soil, waterways and ground water.
Clean-up methods and materials and containment measures
 Spills should be contained by, and covered with suitable absorbent material and removed for disposal.

7. Handling and storage

Precautions for safe handling
Handling Technical measures Avoid contact with skin, eyes and clothing. Wash hands after handling.
 Local and general ventilation Use only with adequate ventilation.
 Precautions See Section 8 (Exposure Controls/Personal Protection).
 Safehandling advice See Section 10 (Stability and reactivity).
Storage Suitable storage conditions Protect from sunlight. Keep container tightly closed.
 Safepackagingmaterials Use plastic container that have enough toughness.

8. Exposure controls/personal protection

Engineering measures
 Evacuate and ventilate spill area. Provide easy access to water supply and eye wash facilities.
Personal protective equipment
 Respiratory protection Wear suitable respiratory protection.
 Hand protection Wear suitable gloves.
 Eye protection Use eye protection. Use face shield in case of splash risk.
 Skin and body protection Wear suitable protective clothing.
Hygiene measures When using, do not eat, drink or smoke. Avoid contact with eyes. Avoid contact

with skin. Keep away from food and drink. Handle in accordance with good industrial hygiene and safety practice.

9. Physical and Chemical Properties

Information on basic physical and chemical properties

| | |
|---------------------------|--------------------|
| Physical properties | |
| Appearance: | Liquid |
| Color: | Colourless, Clear |
| Odor: | Odourless |
| pH: | 6.5 Approx. |
| Flash point: | Not flammable |
| Auto-ignition temperature | Not flammable |
| Solubility | |
| Solubility in water: | Completely soluble |

10. Stability and Reactivity

| | |
|---|--|
| Chemical stability | Stable under normal storage/handling conditions. |
| Conditions to avoid | Freezing. Protect against direct sunlight. |
| Hazardous decomposition products | CO, CO2 Nitrogen oxides (NOx). |

11. Toxicological Information

| | |
|---|--|
| Acute toxicity | Harmful if swallowed. |
| TestResults | Acute OralLD50Rat:> 500mg/kg |
| Skin corrosion/irritation | moderate |
| Serious eyedamage/eye irritation | May cause slight transient (temporary) eye irritation. |
| Carcinogenicity | Substances in group [1;2A;2B] by IARC (International Agency for Research on Cancer):None |

12. Ecological Information

| | |
|-------------------------------|------------------|
| Bioaccumulation | Not established. |
| Mobilityinsoil | Not established. |
| Otherhazardous effects | Not established |

13. Disposal considerations

When your own wastewater treatment plant is not available, collect entire waste and then charge to a licensed industrial waste management professional with manifests for industrial waste. Follow the laws and regulations in your country while disposing of this product or waste.

14. Transport Information

| | |
|---|-----------------------------------|
| UN No, UN CLASS | Not applicable to UN NO. |
| Marine transportation is regulated by IMDG Code. Air transportation is regulated by IATA Dangerous Goods Regulations. | |
| IMDG | Not regulated as dangerous goods. |
| IATA | Not regulated as dangerous goods. |
| Emergency Response Guide Number | 171 |

15. Regulatory Information

Law concerning the Examination and Regulation of Manufacture etc. of Chemical Substances

| | |
|---------------------------------------|----------------|
| Class 1 Specified Chemical Substance: | Not regulated. |
| Class 2 Specified Chemical Substance: | Not regulated. |
| Type 1 Monitoring Chemical Substance: | Not regulated. |
| Type 2 Monitoring Chemical Substance: | Not regulated. |
| Type 3 Monitoring Chemical Substance: | Not regulated. |

Industrial Safety and Health Law

| | |
|---|----------------|
| Dangerous Substances Flammable: | Not regulated. |
| Dangerous Substances Flammable Gases: | Not regulated. |
| Dangerous Substances Oxidizing: | Not regulated. |
| Dangerous Substances Explosives: | Not regulated. |
| Dangerous Substances Ignitable: | Not regulated. |
| Harmful Substances Carcinogen: | Not regulated. |
| Class 1 Designated Chemical Substances: | Not regulated. |
| Class 2 Designated Chemical Substances: | Not regulated. |
| Class 3 Designated Chemical Substances: | Not regulated. |

| | |
|---|----------------|
| Class 1 Organic Solvents Preparations: | Not regulated. |
| Class 2 Organic Solvents Preparations: | Not regulated. |
| Class 3 Organic Solvents Preparations: | Not regulated. |
| Notifiable Substance: | Not regulated. |
| Labeling Requirements: | Not regulated. |
| Others: | Not regulated. |
| Poisonous and Deleterious Substances Control Law | |
| Specified Poisonous Substance – Main Law: | Not regulated. |
| Specified Poisonous Substance – Cabinet Order: | Not regulated. |
| Poisonous Substances – Main Law: | Not regulated. |
| Poisonous Substances – Cabinet Order: | Not regulated. |
| Deleterious Substances – Main Law: | Not regulated. |
| Deleterious Substances – Cabinet Order: | Not regulated. |
| Enforcement Order Article 32-2: | Not regulated. |
| Enforcement Order Article 32-3: | Not regulated. |
| Not Considered Poisonous: | Not regulated. |
| Not Considered Deleterious: | Not regulated. |
| Cabinet Order, Preparations: | Not regulated. |
| Fire Service Law | |
| Class 1 Oxidizing Solids: | Not regulated. |
| Class 2 Flammable Solids: | Not regulated. |
| Class 3 Spontaneous combustibility and Water-reactivity Substances: | Not regulated. |
| Class 4 Flammable Liquids: | Not regulated. |
| Class 5 Self-Reactive Substances: | Not regulated. |
| Class 6 Oxidizing Liquids: | Not regulated. |
| Designated Flammable Substances: | Not regulated. |
| Storage Reporting Substance: | Not regulated. |
| Japan PRTR | |
| Specific Class 1 Designated Substance: | Not regulated. |
| Class 1 Designated Substance: | Not regulated. |
| Class 2 Designated Substance: | Not regulated. |
| Ship Safety Law | Not regulated. |
| Civil Aeronautics law | Not regulated. |
| Japan Marine Pollution Prevention Law | Not regulated. |
| High Pressure Gas Safety law | Not regulated. |
| Gun Powder Control Law | Not regulated. |

16. Other information

GHS classification and labelling

Acute Tox. 4: H302

Skin Irrit. 2: H315

Eye Irrit. 2: H319

Reference Book

Globally Harmonized System of classification and labelling of chemicals, (5th ed., 2013), UN

Recommendations on the TRANSPORT OF DANGEROUS GOODS 19th edit., 2015 UN

Classification, labelling and packaging of substances and mixtures (table3-1 ECNO6182012)

JIS Z 7252:2014, JIS Z 7253:2012

NITE CHRIP (<http://www.safe.nite.go.jp/japan/sougou/view/SystemTop.jp.faces>)

General Disclaimer

This information contained in this data sheet represents the best information currently available to us. However, no warranty is made with respect to its completeness and we assume no liability resulting from its use. It are advised to make their own tests to determinate the safety and suitability of each such product or combination for their own purposes.

Safety Data Sheet

1. Identification of the substance/mixture and of the company/undertaking

Product identifier:

Product name: Wash Buffer
Product code: WRT-S1
SDS NO: WRTS1_JPE_1

Details of the supplier of the safety data sheet

Manufacturer/Supplier: KURABO INDUSTRIES LTD.
Address: Advanced Technology Center, 14-30 Shimokida-cho, Neyagawa, Osaka, 572-0823 JAPAN
Division: Bio-Medical department
Telephone number: +81-72-820-3079
FAX: +81-72-820-3095

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

Relevant identified uses of the product: Reagents for automated nucleic acid isolation system
 Uses advised against: For research use only

2. Hazards identification

GHS classification and label elements of the product

Classification of the substance or mixture

| | |
|-------------------------|--|
| PHYSICAL HAZARDS | Flammable liquids: Category 2 |
| HEALTH HAZARDS | Serious eye damage / eyeirritation: Category 2A Carcinogenicity: Category 1A Reproductive toxicity: Category 1A Specific target organ systemictoxicity – single exposure: Category 3(respiratory tract irritation) Category 3(Narcotic effect) Specific target organ systemictoxicity – Repeated exposure Category 1(liver) Category 2(Central nervous system) |

Label elements


Signal word: Danger

HAZARD STATEMENT

H225 Highly flammable liquid and vapour
 H319 Causes serious eye irritation
 H335 May cause respiratory irritation
 H336 May cause drowsiness or dizziness
 H350 May cause cancer
 H360 May damage fertility or the unborn child
 H372 Causes damage to organs through prolonged or repeated exposure
 H373 May cause damage to organs through prolonged or repeated exposure

PRECAUTIONARY STATEMENT
Prevention

P201 Obtain special instructions before use.
 P202 Do not handle until all safety precautions have been read and understood.
 P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. 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/fumes/gas/mist/vapours/spray.
 P261 Avoid breathing dust/fumes/gas/mist/vapours/spray.
 P264 Wash contaminated parts 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 gloves/protective clothing/eye protection/face protection.

Response

P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
 P304 + P340 IF INHALED: Remove person to fresh air and keep 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: Call a POISON CENTER or doctor/physician.
 P312 Call a POISON CENTER or doctor if you feel unwell.
 P314 Get medical advice/attention if you feel unwell.
 P337 + P313 If eye irritation persists: Get medical advice/attention.
 P370 + P378 In case of fire: Use appropriate media to extinguish.

Storage

P405 Store locked up.
 P403 + P233 Store in a well ventilated place. Keep container tightly closed.
 P235 Keep cool.

Disposal

P501 Dispose of contents/container in accordance with local/national regulation.

3. Composition/information on ingredients

Mixture/Substance selection Mixture

| Ingredient name | Content(%) | CAS No. |
|-----------------|------------|-----------|
| ethanol | 65 – 75 | 64-17-5 |
| Water | Balance | 7732-18-5 |

Note : The figures shown above are not the specifications of the product.
 Generally chemical substances greater than 1% of the total are listed.

4. First-aid measures

Descriptions of first-aid measures
IF INHALED Rescuers should wear proper personal protective equipment suitable for situation.
 Remove person to fresh air and keep comfortable for breathing.
 Call a POISON CENTER or doctor/physician if you feel unwell.
IF ON SKIN (or hair) Remove contaminated clothing. Wash with plenty of soap and water.
 If skin irritation occurs: Get medical advice/attention.
IF IN EYES Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
 If eye irritation persists: Get medical advice/attention.
IF SWALLOWED Rinse mouth.
 Call a POISON CENTER or doctor/physician if you feel unwell.

5. Fire-fighting measures

Extinguishing media
Suitable extinguishing media Carbon dioxide, dry chemical and alcohol-resistant foam, water spray.
Extinguishing media to avoid None.
Specific hazards arising from the chemical product Flammable.
Protection of fire-fighters Wear adequate personal protective equipment. Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear.

6. Accidental release measures

Personnel precautions, protective equipment and emergency measures
 For indoor, provide adequate ventilation process until the end of working.
 Wear adequate personal protective equipment, see Section 8 (Exposure Controls/Personal Protection)
Environmental precautions
 To be careful not discharged to the environment without being properly handled waste water contaminated.
 See Section 12 for additional ecological information.
Clean-up methods and materials and containment measures
 Spills should be contained by, and covered with suitable absorbent material and removed for disposal.

7. Handling and storage**Precautions for safe handling**

| | | |
|-----------------|-------------------------------|--|
| Handling | Technical measures | Avoid contact with skin, eyes and clothing. Wash hands after handling. |
| | Local and general ventilation | Use only with adequate ventilation. |
| | Precautions | See Section 8 (Exposure Controls/Personal Protection). |
| Storage | Safe handling advice | See Section 10 (Stability and reactivity). |
| | Suitable storage conditions | Protect from sunlight. Keep container tightly closed. |
| | Safe packaging materials | Use plastic container that have enough toughness. |

8. Exposure controls/personal protection**Engineering measures**

Evacuate and ventilate spill area. Provide easy access to water supply and eye wash facilities.

Exposure limits

| Chemical Name | JSOH (Japan) | ISHL (Japan) | ACGIH |
|-----------------|--------------|--------------|----------------|
| Ethanol 64-17-5 | N/A | N/A | STEL: 1000 ppm |

Personal protective equipment

| | |
|--------------------------|---|
| Respiratory protection | Wear suitable respiratory protection. |
| Hand protection | Wear suitable gloves. |
| Eye protection | Use eye protection. Use face shield in case of splash risk. |
| Skin and body protection | Wear suitable protective clothing. |

Hygiene measures Handle in accordance with good industrial hygiene and safety practice.

9. Physical and Chemical Properties**Information on basic physical and chemical properties**

| Physical properties | |
|---------------------------|--------------------|
| Appearance: | Liquid |
| Color: | Colourless, Clear |
| Odor: | Alcohol odor |
| pH: | 7.6 |
| Flash point: | no data |
| Auto-ignition temperature | no data |
| Solubility | |
| Solubility in water: | Completely soluble |

10. Stability and Reactivity

| | |
|---|---|
| Chemical stability | Stable under normal storage/handling conditions. |
| Conditions to avoid | Freezing. Extremes of temperature and direct sunlight, Heat, flames and sparks. |
| Hazardous decomposition products | CO, CO2 Nitrogen oxides (NOx). |

11. Toxicological Information**Acute toxicity**

| Chemical Name | Oral LD50 | Dermal LD50 | Inhalation LC50 |
|---------------|----------------|-------------|-------------------|
| Ethanol | 6200mg/kg(Rat) | N/A | 20000ppm/10H(Rat) |

| Chemical Name | Acute toxicity –oral– source information | Acute toxicity –dermal– source information | Acute toxicity –inhalation gassource information |
|---------------|--|--|--|
| Ethanol | LD50(Rat) : 6,200 mg/kg, 11,500 mg/kg, 17,800 mg/kg, 13,700 mg/kg(PATY(6th, 2012)), 15,010 mg/kg, 7,000–11,000 | LDLo(Rabbit) = 20,000 mg/kg(SIDS(2005)) | Based on the NITE GHS classification results. |

| Chemical Name | Acute toxicity –inhalation vapor– source information | Acute toxicity –inhalation dustsource information | Acute toxicity –inhalation mistsource information |
|---------------|---|---|---|
| Ethanol | LC50(Rat) = 63,000 ppmV (DFGOT vol.12 (1999)), 66,280 ppmV(124.7 mg/L) (SIDS | Based on the NITE GHS classification results. | Based on the NITE GHS classification results. |

Skin corrosion/irritation

| Chemical Name | Skin corrosion irritation source information |
|---------------|---|
| Ethanol | Based on the NITE GHS classification results. |

Serious eyedamage/eye irritation

| Chemical Name | Serious eye damage source information |
|---------------|---|
| Ethanol | Based on the NITE GHS classification results. |

Respiratory or skin sensitization

| Chemical Name | Respiratory, Skin sensitization source information |
|---------------|--|
| Ethanol | Based on the NITE GHS classification results. |

Reproductive cell mutagenicity

| Chemical Name | Mutagenic source information |
|---------------|---|
| Ethanol | Based on the NITE GHS classification results. |

Carcinogenicity

| Chemical Name | Carcinogenicity source information |
|---------------|------------------------------------|
| Ethanol | A3 (ACGIH (7th, 2012)) |

| Chemical Name | NTP | IARC | ACGIH | JSOH (Japan) |
|-----------------|-------|---------|-------|--------------|
| Ethanol 64-17-5 | Known | Group 1 | A3 | - |

Reproductive toxicity

| Chemical Name | Reproductive toxicity source information |
|---------------|---|
| Ethanol | Based on the NITE GHS classification results. |

STOT-single exposure

| Chemical Name | STOT -single exposure- source information |
|---------------|---|
| Ethanol | Based on the NITE GHS classification results. |

STOT-repeated exposure

| Chemical Name | STOT -repeated exposure- source information |
|---------------|---|
| Ethanol | Based on the NITE GHS classification results. |

Aspiration hazard

| Chemical Name | Aspiration Hazard source information |
|---------------|---|
| Ethanol | Based on the NITE GHS classification results. |

12. Ecological Information**Bioaccumulation**

| Chemical Name | Algae/aquatic plants | Fish | Crustacea |
|---------------|-------------------------------------|---|------------------------------------|
| Ethanol | EC50: Chlorella alga 1000 mg/L 96 h | LC50: Fathead minnow >100mg/L 96h LC50: Oncorhynchus mykiss =11200ppm 96h | EC50: Daphnia magna 5463 mg/L 48 h |

Persistence and degradability Degree of decomposition: 89 % by BOD

Bioaccumulative potential No information available

Mobility in soil No information available

Hazard to the ozone layer Mobility No information available

13. Disposal considerations

When your own wastewater treatment plant is not available, collect entire waste and then charge to a licensed industrial waste management professional with manifests for industrial waste. Follow the laws and regulations in your country while disposing of this product or waste.

14. Transport Information**International regulation**

| | |
|--|--|
| Marine transportation | Marine transportation is regulated by IMDG Code. |
| Air transportation | Air transportation is regulated by IATA Dangerous Goods Regulations. |
| UN code | 1170 |
| Class | 3 |
| Proper Shipping Name | Ethanol solution |
| Packing group | II |
| Marine pollutant | Not applicable |
| MARPOL 73/78 Annex II and liquid substances to be bulk loaded by IBC code | Not applicable |

15. Regulatory Information

International Inventories

| | |
|---------------|--------|
| EINECS/ELINCS | Listed |
| TSCA | Listed |

Japanese regulations

Law concerning the Examination and Regulation of Manufacture etc. of Chemical Substances

Regulated. (2)-202

Industrial Safety and Health Act

Notifiable Substances (Law Art.57-2, Enforcement Order Art.18-2 Attached Table No.9)No.61
Dangerous Substances – Flammable Substance (Enforcement Order Attached Table 1 Item4)
Harmful Substances Whose Names Are to be Indicated on the Label (Law Art.57, Para.1,
Enforcement Order Art.18)

Poisonous and Deleterious Substances Control Law

Not regulated.

Fire Service Law

Class 4 Flammable Liquids: Regulated. alcohols (water soluble)

Regulations for the carriage and storage of dangerous goods in ship

Flammable Liquids (Ordinance Art.3, Ministry of Transportation Ordinance Regarding
Transport by Ship and Storage, Attached Table 1)

Japan PRTR

Not regulated.

Civil Aeronautics law

Flammable Liquids (Ordinance Art.194, MITL Notification for Air Transportation of Explosives etc., Attached Table 1)

Japan Marine Pollution Prevention Law

Enforcement ordinance Appendix No. 1 Noxious liquid substance Category Z

16. Other information

GHS classification and labelling

Flam. Liq. 2: H225
Eye Irrit. 2A: H319
Carc. 1A: H350
Repr. 1A: H360
STOT SE 3: H335, H336
STOT RE 1: H372
STOT RE 2: H373

Reference Book

Globally Harmonized System of classification and labelling of chemicals, (5th ed., 2013), UN
Recommendations on the TRANSPORT OF DANGEROUS GOODS 19th edit., 2015 UN
Classification, labelling and packaging of substances and mixtures (table3-1 ECNO6182012)
JIS Z 7252:2014, JIS Z 7253:2012
NITE CHRIP (<http://www.safe.nite.go.jp/japan/sougou/view/SystemTop.jp.faces>)

General Disclaimer

This information contained in this data sheet represents the best information currently available to us. However, no warranty is made with respect to its completeness and we assume no liability resulting from its use. It are advised to make their own tests to determinate the safety and suitability of each such product or combination for their own purposes.

Safety Data Sheet

1. Identification of the substance/mixture and of the company/undertaking

Product identifier:

Product name: Solubilization Buffer
Product code: SRT-02
SDS NO: SRT02_JPE_1.1

Details of the supplier of the safety data sheet

Manufacturer/Supplier: KURABO INDUSTRIES LTD.
Address: Advanced Technology Center, 14-30 Shimokida-cho, Neyagawa, Osaka, 572-0823 JAPAN
Division: Bio-Medical department
Telephone number: +81-72-820-3079
FAX: +81-72-820-3095

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

Relevant identified uses of the product: Reagents for automated nucleic acid isolation system
 Uses advised against: For research use only

2. Hazards identification

GHS classification and label elements of the product

Classification of the substance or mixture
 Not applicable to GHS classification

Label elements

No hazard pictogram
 No Signal word

3. Composition/information on ingredients

Mixture/Substance selection Mixture

| Ingredient name | Content(%) | CAS No. |
|---|------------|-----------|
| polyoxyethylene sorbitan fatty acid ester | 10-20 | — |
| hydrochloride salts of aminoalcohol | 1-5 | — |
| Water | Balance | 7732-18-5 |

Note : The figures shown above are not the specifications of the product.
 Generally chemical substances greater than 1% of the total are listed.

4. First-aid measures

| | |
|---|---|
| Descriptions of first-aid measures | Rescuers should wear proper personal protective equipment suitable for situation. |
| IF INHALED | Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell. |
| IF ON SKIN (or hair) | Remove contaminated clothing. Wash with plenty of soap and water. If skin irritation occurs: Get medical advice/attention. |
| IF IN EYES | Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention. |
| IF SWALLOWED | Rinse mouth. Call a POISON CENTER or doctor/physician if you feel unwell. |

5. Fire-fighting measures

| | |
|-------------------------------------|--|
| Extinguishing media | |
| Suitable extinguishing media | Carbon dioxide, dry chemical and protein based foam. |
| Extinguishing media to avoid | None. |
| Special fire fighting | Keep personnel removed from and upwind of fire. Water runoff can damage the environment. |
| Procedures | Dike and collect water used to fight fire Evacuate area and fight fire from a safe distance. |
| Protection of fire-fighters | Wear adequate personal protective equipment. |

6. Accidental release measures

| | |
|---|--|
| Personnel precautions, protective equipment and emergency measures | |
| Wear adequate personal protective equipment, see Section 8 (Exposure Controls/Personal Protection) | |
| Environmental precautions | |
| Prevent from entering into soil, waterways and ground water. | |
| Clean-up methods and materials and containment measures | |
| Spills should be contained by, and covered with suitable absorbent material and removed for disposal. | |

7. Handling and storage

| | | |
|--------------------------------------|-------------------------------|--|
| Precautions for safe handling | | |
| Handling | Technical measures | Avoid contact with skin, eyes and clothing. Wash hands after handling. |
| | Local and general ventilation | Use only with adequate ventilation. |
| | Precautions | See Section 8 (Exposure Controls/Personal Protection). |
| | Safe handling advice | See Section 10 (Stability and reactivity). |
| Storage | Suitable storage conditions | Protect from sunlight. Keep container tightly closed. |
| | Safe packaging materials | Use plastic container that have enough toughness. |

8. Exposure controls/personal protection

| | |
|---|---|
| Engineering measures | |
| Evacuate and ventilate spill area. Provide easy access to water supply and eye wash facilities. | |
| Personal protective equipment | |
| Respiratory protection | Wear suitable respiratory protection. |
| Hand protection | Wear suitable gloves. |
| Eye protection | Use eye protection. Use face shield in case of splash risk. |
| Skin and body protection | Wear suitable protective clothing. |
| Hygiene measures | |
| Handle in accordance with good industrial hygiene and safety practice. | |

9. Physical and Chemical Properties

| | |
|--|-----------------------------------|
| Information on basic physical and chemical properties | |
| Physical properties | |
| Appearance: | Liquid |
| Color: | Colourless to light yellow, Clear |
| Odor: | Practically odourless |
| pH: | 6 Approx. |
| Flash point: | Not flammable |
| Auto-ignition temperature | Not flammable |
| Solubility | |
| Solubility in water: | Completely soluble |

10. Stability and Reactivity

| | |
|---|--|
| Chemical stability | Stable under normal storage/handling conditions. |
| Conditions to avoid | Freezing. Protect against direct sunlight. |
| Hazardous decomposition products | CO, CO2 Nitrogen oxides (NOx). |

11. Toxicological Information

| | |
|----------------------------------|-----------------------------------|
| Acute toxicity | |
| Test Results | Acute Oral LD50 Rat: > 2000 mg/kg |
| Skin corrosion/irritation | No irritation |

Serious eyedamage/eye irritation non irritant
Carcinogenicity Substances in group [1;2A;2B] by IARC (International Agency for Research on Cancer):None

12. Ecological Information

Bioaccumulation Not established.
Mobilityinsoil Not established.
Otherhazardous effects Not established

13. Disposal considerations

When your own wastewater treatment plant is not available, collect entire waste and then charge to a licensed industrial waste management professional with manifests for industrial waste. Follow the laws and regulations in your country while disposing of this product or waste.

14. Transport Information

UN No, UN CLASS Not applicable to UN NO.
 Marine transportation is regulated by IMDG Code. Air transportation is regulated by IATA Dangerous Goods Regulations.
IMDG Not regulated as dangerous goods.
IATA Not regulated as dangerous goods.
Emergency Response Guide Number 171

15. Regulatory Information

Law concerning the Examination and Regulation of Manufacture etc. of Chemical Substances

Class 1 Specified Chemical Substance: Not regulated.
 Class 2 Specified Chemical Substance: Not regulated.
 Type 1 Monitoring Chemical Substance: Not regulated.
 Type 2 Monitoring Chemical Substance: Not regulated.
 Type 3 Monitoring Chemical Substance: Not regulated.

Industrial Safety and Health Law

Dangerous Substances Flammable: Not regulated.
 Dangerous Substances Flammable Gases: Not regulated.
 Dangerous Substances Oxidizing: Not regulated.
 Dangerous Substances Explosives: Not regulated.
 Dangerous Substances Ignitable: Not regulated.
 Harmful Substances Carcinogen: Not regulated.
 Class 1 Designated Chemical Substances: Not regulated.
 Class 2 Designated Chemical Substances: Not regulated.
 Class 3 Designated Chemical Substances: Not regulated.
 Class 1 Organic Solvents Preparations: Not regulated.
 Class 2 Organic Solvents Preparations: Not regulated.
 Class 3 Organic Solvents Preparations: Not regulated.
 Notifiable Substance: Not regulated.
 Labeling Requirements: Not regulated.
 Others: Not regulated.

Poisonous and Deleterious Substances Control Law

Specified Poisonous Substance – Main Law: Not regulated.
 Specified Poisonous Substance – Cabinet Order: Not regulated.
 Poisonous Substances – Main Law: Not regulated.
 Poisonous Substances – Cabinet Order: Not regulated.
 Deleterious Substances – Main Law: Not regulated.
 Deleterious Substances – Cabinet Order: Not regulated.
 Enforcement Order Article 32-2: Not regulated.
 Enforcement Order Article 32-3: Not regulated.
 Not Considered Poisonous: Not regulated.
 Not Considered Deleterious: Not regulated.
 Cabinet Order, Preparations: Not regulated.

Fire Service Law

Class 1 Oxidizing Solids: Not regulated.
 Class 2 Flammable Solids: Not regulated.
 Class 3 Spontaneous combustibility and Water-reactivity Substances: Not regulated.
 Class 4 Flammable Liquids: Not regulated.

| | |
|--|----------------|
| Class 5 Self-Reacting Substances: | Not regulated. |
| Class 6 Oxidizing Liquids: | Not regulated. |
| Designated Flammable Substances: | Not regulated. |
| Storage Reporting Substance: | Not regulated. |
| Japan PRTR | |
| Specific Class 1 Designated Substance: | Not regulated. |
| Class 1 Designated Substance: | Not regulated. |
| Class 2 Designated Substance: | Not regulated. |
| Ship Safety Law | Not regulated. |
| Civil Aeronautics law | Not regulated. |
| Japan Marine Pollution Prevention Law | Not regulated. |
| High Pressure Gas Safety law | Not regulated. |
| Gun Powder Control Law | Not regulated. |

16. Other information

Reference Book

Globally Harmonized System of classification and labelling of chemicals, (5th ed., 2013), UN
Recommendations on the TRANSPORT OF DANGEROUS GOODS 19th edit., 2015 UN
Classification, labelling and packaging of substances and mixtures (table3-1 ECNO6182012)
JIS Z 7252:2014, JIS Z 7253:2012
NITE CHRIP (<http://www.safe.nite.go.jp/japan/sougou/view/SystemTop.jp.faces>)

General Disclaimer

This information contained in this data sheet represents the best information currently available to us. However, no warranty is made with respect to its completeness and we assume no liability resulting from its use. It are advised to make their own tests to determinate the safety and suitability of each such product or combination for their own purposes.

Safety Data Sheet

1. Identification of the substance/mixture and of the company/undertaking

Product identifier:

Product name: Elution Buffer
Product code: CRT-S1
SDS NO: CRTS1_JPE_1.1

Details of the supplier of the safety data sheet

Manufacturer/Supplier: KURABO INDUSTRIES LTD.
Address: Advanced Technology Center, 14-30 Shimokida-cho, Neyagawa, Osaka, 572-0823 JAPAN
Division: Bio-Medical department
Telephone number: +81-72-820-3079
FAX: +81-72-820-3095

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

Relevant identified uses of the product: Reagents for automated nucleic acid isolation system
 Uses advised against: For research use only

2. Hazards identification

GHS classification and label elements of the product

Classification of the substance or mixture
 Not applicable to GHS classification

Label elements

No hazard pictogram
 No Signal word

3. Composition/information on ingredients

Mixture/Substance selection Mixture

| Ingredient name | Content(%) | CAS No. |
|-----------------|------------|-----------|
| Water | 80-100 | 7732-18-5 |

Note : The figures shown above are not the specifications of the product.
 Generally chemical substances greater than 1% of the total are listed.

4. First-aid measures

Descriptions of first-aid measures Rescuers should wear proper personal protective equipment suitable for situation.

IF INHALED Remove person to fresh air and keep comfortable for breathing.
 Call a POISON CENTER or doctor/physician if you feel unwell.

IF ON SKIN(or hair) Remove contaminated clothing. Wash with plenty of soap and water.
 If skin irritation occurs: Get medical advice/attention.

IF IN EYES Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
 If eye irritation persists: Get medical advice/attention.

IF SWALLOWED Rinse mouth.
 Call a POISON CENTER or doctor/physician if you feel unwell.

5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media Carbon dioxide, dry chemical and protein based foam.

Extinguishing media to avoid None.

Special fire fighting Keep personnel removed from and upwind of fire. Water runoff can damage the environment.

Procedures Dike and collect water used to fight fire Evacuate area and fight fire from a safe distance.

Protection of fire-fighters Wear adequate personal protective equipment.

6. Accidental release measures

Personnel precautions, protective equipment and emergency measures

Wear adequate personal protective equipment, see Section 8 (Exposure Controls/Personal Protection)

Environmental precautions

Prevent from entering into soil, waterways and ground water.

Clean-up methods and materials and containment measures

Spills should be contained by, and covered with suitable absorbent material and removed for disposal.

7. Handling and storage

Precautions for safe handling

| | | |
|-----------------|-------------------------------|--|
| Handling | Technical measures | Avoid contact with skin, eyes and clothing. Wash hands after handling. |
| | Local and general ventilation | Use only with adequate ventilation. |
| Storage | Precautions | See Section 8 (Exposure Controls/Personal Protection). |
| | Safeguarding advice | See Section 10 (Stability and reactivity). |
| | Suitable storage conditions | Protect from sunlight. Keep container tightly closed. |
| | Safepackaging materials | Use plastic container that have enough toughness. |

8. Exposure controls/personal protection

Engineering measures

Evacuate and ventilate spill area. Provide easy access to water supply and eye wash facilities.

Personal protective equipment

| | |
|--------------------------|---|
| Respiratory protection | Wear suitable respiratory protection. |
| Hand protection | Wear suitable gloves. |
| Eye protection | Use eye protection. Use face shield in case of splash risk. |
| Skin and body protection | Wear suitable protective clothing. |

Hygiene measures

Handle in accordance with good industrial hygiene and safety practice.

9. Physical and Chemical Properties

Information on basic physical and chemical properties

| | |
|---------------------------|--------------------|
| Physical properties | |
| Appearance: | Liquid |
| Color: | Colourless, Clear |
| Odor: | Odourless |
| pH: | 6.5 |
| Flash point: | Not flammable |
| Auto-ignition temperature | Non combustible |
| Solubility | |
| Solubility in water: | Completely soluble |
| Viscosity | Like water |

10. Stability and Reactivity

| | |
|---|--|
| Chemical stability | Stable under normal storage/handling conditions. |
| Conditions to avoid | Freezing. Protect against direct sunlight. |
| Hazardous decomposition products | CO, CO2 Nitrogen oxides (NOx). |

11. Toxicological Information

Acute toxicity

Test Results Acute Oral LD50 Rat: > 2000 mg/kg

Skin corrosion/irritation

No irritation

Serious eyedamage/eye irritation

non irritant

Carcinogenicity

Substances in group [1;2A;2B] by IARC (International Agency for Research on Cancer):None

12. Ecological Information

| | |
|--------------------------------|------------------|
| Bioaccumulation | Not established. |
| Mobility in soil | Not established. |
| Other hazardous effects | Not established |

13. Disposal considerations

When your own wastewater treatment plant is not available, collect entire waste and then charge to a licensed industrial waste management professional with manifests for industrial waste. Follow the laws and regulations in your country while disposing of this product or waste.

14. Transport Information

| | |
|---|-----------------------------------|
| UN No, UN GLASS | Not applicable to UN NO. |
| Marine transportation is regulated by IMDG Code. Air transportation is regulated by IATA Dangerous Goods Regulations. | |
| IMDG | Not regulated as dangerous goods. |
| IATA | Not regulated as dangerous goods. |

15. Regulatory Information

Law concerning the Examination and Regulation of Manufacture etc. of Chemical Substances

| | |
|---------------------------------------|----------------|
| Class 1 Specified Chemical Substance: | Not regulated. |
| Class 2 Specified Chemical Substance: | Not regulated. |
| Type 1 Monitoring Chemical Substance: | Not regulated. |
| Type 2 Monitoring Chemical Substance: | Not regulated. |
| Type 3 Monitoring Chemical Substance: | Not regulated. |

Industrial Safety and Health Law

| | |
|---|----------------|
| Dangerous Substances Flammable: | Not regulated. |
| Dangerous Substances Flammable Gases: | Not regulated. |
| Dangerous Substances Oxidizing: | Not regulated. |
| Dangerous Substances Explosives: | Not regulated. |
| Dangerous Substances Ignitable: | Not regulated. |
| Harmful Substances Carcinogen: | Not regulated. |
| Class 1 Designated Chemical Substances: | Not regulated. |
| Class 2 Designated Chemical Substances: | Not regulated. |
| Class 3 Designated Chemical Substances: | Not regulated. |
| Class 1 Organic Solvents Preparations: | Not regulated. |
| Class 2 Organic Solvents Preparations: | Not regulated. |
| Class 3 Organic Solvents Preparations: | Not regulated. |
| Notifiable Substance: | Not regulated. |
| Labeling Requirements: | Not regulated. |
| Others: | Not regulated. |

Poisonous and Deleterious Substances Control Law

| | |
|--|----------------|
| Specified Poisonous Substance – Main Law: | Not regulated. |
| Specified Poisonous Substance – Cabinet Order: | Not regulated. |
| Poisonous Substances – Main Law: | Not regulated. |
| Poisonous Substances – Cabinet Order: | Not regulated. |
| Deleterious Substances – Main Law: | Not regulated. |
| Deleterious Substances – Cabinet Order: | Not regulated. |
| Enforcement Order Article 32-2: | Not regulated. |
| Enforcement Order Article 32-3: | Not regulated. |
| Not Considered Poisonous: | Not regulated. |
| Not Considered Deleterious: | Not regulated. |
| Cabinet Order, Preparations: | Not regulated. |

Fire Service Law

| | |
|---|----------------|
| Class 1 Oxidizing Solids: | Not regulated. |
| Class 2 Flammable Solids: | Not regulated. |
| Class 3 Spontaneous combustibility and Water-reactivity Substances: | Not regulated. |
| Class 4 Flammable Liquids: | Not regulated. |
| Class 5 Self-Reactive Substances: | Not regulated. |
| Class 6 Oxidizing Liquids: | Not regulated. |
| Designated Flammable Substances: | Not regulated. |
| Storage Reporting Substance: | Not regulated. |

Japan PRTR

| | |
|--|----------------|
| Specific Class 1 Designated Substance: | Not regulated. |
| Class 1 Designated Substance: | Not regulated. |
| Class 2 Designated Substance: | Not regulated. |

| | |
|--|----------------|
| Ship Safety Law | Not regulated. |
| Civil Aeronautics law | Not regulated. |
| Japan Marine Pollution Prevention Law | Not regulated. |
| High Pressure Gas Safety law | Not regulated. |
| Gun Powder Control Law | Not regulated. |

16. Other information

Reference Book

Globally Harmonized System of classification and labelling of chemicals, (5th ed., 2013), UN
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Classification, labelling and packaging of substances and mixtures (table3-1 ECNO6182012)
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General Disclaimer

This information contained in this data sheet represents the best information currently available to us. However, no warranty is made with respect to its completeness and we assume no liability resulting from its use. It are advised to make their own tests to determinate the safety and suitability of each such product or combination for their own purposes.

Safety Data Sheet

1. Identification of the substance/mixture and of the company/undertaking

Product identifier:

Product name: Ethanol
Product code: Ethanol
SDS NO: ETOH_JPE_1.1

Details of the supplier of the safety data sheet

Manufacturer/Supplier: KURABO INDUSTRIES LTD.
Address: Advanced Technology Center, 14-30 Shimokida-cho, Neyagawa, Osaka, 572-0823 JAPAN
Division: Bio-Medical department
Telephone number: +81-72-820-3079
FAX: +81-72-820-3095

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

Relevant identified uses of the product: Reagents for automated nucleic acid isolation system
 Uses advised against: For research use only

2. Hazards identification

GHS classification and label elements of the product

Classification of the substance or mixture

| | |
|-------------------------|--|
| PHYSICAL HAZARDS | Flammable liquids: Category 2 |
| HEALTH HAZARDS | Serious eye damage / eye irritation: Category 2B |
| | Carcinogenicity: Category 1A |
| | Reproductive toxicity: Category 1A |
| | Specific target organ systemictoxicity – single exposure: |
| | Category 3(respiratory tract irritation) |
| | Category 3(Narcotic effect) |
| | Specific target organ systemictoxicity – Repeated exposure |
| | Category 1(liver) |
| | Category 2(Central nervous system) |

Label elements


Signal word: Danger

HAZARD STATEMENT

H225 Highly flammable liquid and vapor
 H320 Causes 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

PRECAUTIONARY STATEMENT
Prevention

P201 Obtain special instructions before use.
 P202 Do not handle until all safety precautions have been read and understood.
 P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. 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/fumes/gas/mist/vapours/spray.
 P261 Avoid breathing dust/fumes/gas/mist/vapours/spray.
 P264 Wash contaminated parts 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 gloves/protective clothing/eye protection/face protection.

Response

- P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
- P304 + P340 IF INHALED: Remove person to fresh air and keep 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: Call a POISON CENTER or doctor/physician.
- P312 Call a POISON CENTER or doctor if you feel unwell.
- P314 Get medical advice/attention if you feel unwell.
- P337 + P313 If eye irritation persists: Get medical advice/attention.
- P370 + P378: In case of fire: Use CO2, dry chemical, or foam to extinguish.

Storage

- P405 Store locked up.
- P403 + P233 Store in a well ventilated place. Keep container tightly closed.
- P235 Keep cool.

Disposal

- P501 Dispose of contents/container in accordance with local/national regulation.

3. Composition/information on ingredients

Mixture/Substance selection Substance

| Ingredient name | Content(%) | CAS No. |
|-----------------|------------|---------|
| Ethanol | 99.5 | 64-17-5 |

Note : The figures shown above are not the specifications of the product.
 Generally chemical substances greater than 1% of the total are listed.

4. First-aid measures

| | |
|---|--|
| Descriptions of first-aid measures | Use personal protective equipment as required. |
| IF INHALED | Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell. |
| IF ON SKIN (or hair) | Remove contaminated clothing. Wash with plenty of soap and water. If symptoms persist, Get medical advice/attention. |
| IF IN EYES | Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediate medical attention is required. |
| IF SWALLOWED | Rinse mouth. Never give anything by mouth to an unconscious person. Call a physician or poison control center immediately. Do not induce vomiting without medical advice. |

5. Fire-fighting measures

| | |
|---|--|
| Extinguishing media | |
| Suitable extinguishing media | Dry chemical, CO2, water spray or alcohol-resistant foam, Water spray (fog) |
| Extinguishing media to avoid | No information available. |
| Special extinguishing method | No information available. |
| Specific hazards arising from the chemical product | Extremely flammable |
| Protection of fire-fighters | Use personal protective equipment as required. Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear. |

6. Accidental release measures

Personnel precautions, protective equipment and emergency measures

For indoor, provide adequate ventilation process until the end of working. Deny unnecessary entry other than the people involved by, for example, using a rope. While working, wear appropriate protective equipments to avoid adhering it on skin, or inhaling the gas. Work from windward, and retract the people downwind

Environmental precautions

To be careful not discharged to the environment without being properly handled waste water contaminated. See Section 12 for additional ecological information.

Clean-up methods and materials and containment measures

Absorb dry sand, earth, sawdust and the waste. Collect empty container that can be sealed.

Recovery, neutralization

No information available

Secondary disaster prevention measures

Clean contaminated objects and areas thoroughly observing environmental regulations.

7. Handling and storage**Precautions for safe handling**

| | | |
|-----------------|-------------------------------|--|
| Handling | Technical measures | Highly flammable. Avoid contact with high temperature objects, spark, and strong oxidizing agents. |
| | Local and general ventilation | Use with local exhaust ventilation. |
| | Precautions | Do not rough handling containers, such as upsetting, falling, giving a shock, and dragging. Prevent leakage, overflow, and scattering. Not to generate steam and dust in vain. Seal the container after use. After handling, wash hands and face, and then gargle. In places other than those specified, should not be smoking or eating and drinking. Should not be brought contaminated protective equipment and gloves to rest stops. Deny unnecessary entry of non-emergency personnel to the handling area. |
| Storage | Safe handling advice | Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). |
| | Suitable storage conditions | Store away from sunlight in well-ventilated place at room temperature (preferably cool). Keep container tightly closed. |
| | Safe packaging materials | Glass |
| | Incompatible substances | Strong oxidizing agents |

8. Exposure controls/personal protection**Engineering measures**

In case of indoor workplace, seal the source or use a local exhaust system. Provide the safety shower facility, and hand- and eye-wash facility. And display their position clearly.

Exposure limits

| Chemical Name | JSOH (Japan) | ISHL (Japan) | ACGIH |
|--------------------|--------------|--------------|----------------|
| Ethanol 64-17-5 | N/A | N/A | STEL: 1000 ppm |

Personal protective equipment

| | |
|--------------------------|--|
| Respiratory protection | gas mask for organic gas |
| Hand protection | Protection gloves |
| Eye protection | protective eyeglasses or chemical safety goggles |
| Skin and body protection | Wear suitable protective clothing, protective boots. |

Hygiene measures

When using do not eat, drink or smoke.

9. Physical and Chemical Properties**Information on basic physical and chemical properties**

| Physical properties | |
|--|---------------------|
| Appearance: | Liquid |
| Color: | Colourless, Clear |
| Odor: | characteristic odor |
| pH: | No data available |
| Melting point/freezing point: | -117°C |
| Boiling point, initial boiling point and boiling range | 78°C |
| Flash point: | 13°C |
| Upper/lower flammability or explosive limits | |
| Upper: | 19.0 vol% |
| Lower: | 3.3 vol% |
| Specific Gravity / Relative density: | 0.789-0.791 |
| Auto-ignition temperature: | 371°C |
| Solubility | |
| Water , Diethyl ether: | soluble |
| n-Octanol/water partition coefficient:(log Pow): | -0.32 |
| Auto-ignition temperature: | 371°C |

10. Stability and Reactivity

| | |
|---|--|
| Chemical stability | Stable under recommended storage conditions. |
| Reactivity | No data available |
| Hazardous reactions | May cause ignition on contact with strong oxidizing agents |
| Conditions to avoid | Extremes of temperature and direct sunlight, Heat, flames and sparks |
| Incompatible materials | Strong oxidizing agents |
| Hazardous decomposition products | Carbon monoxide (CO), Carbon dioxide (CO ₂) |

11. Toxicological Information**Acute toxicity**

| Chemical Name | Oral LD50 | Dermal LD50 | Inhalation LC50 |
|---------------|----------------|-------------|-------------------|
| Ethanol | 6200mg/kg(Rat) | N/A | 20000ppm/10H(Rat) |

| Chemical Name | Acute toxicity –oral– source information | Acute toxicity –dermal– source information | Acute toxicity – inhalation gassource information |
|---------------|--|---|---|
| Ethanol | LD50(Rat) : 6,200 mg/kg, 11,500 mg/kg, 17,800 mg/kg, 13,700 mg/kg(PATY(6th, 2012)), 15,010 mg/kg, 7,000–11,000 | LDLo(Rabbit) = 20,000 mg/kg(SIDS(2005)) | Based on the NITE GHS classification results. |

| Chemical Name | Acute toxicity – inhalation vapor– source information | Acute toxicity – inhalation dustsource information | Acute toxicity – inhalation mistsource information |
|---------------|---|--|--|
| Ethanol | LC50(Rat) = 63,000 ppmV (DFGOT vol.12 (1999)), 66,280 ppmV(124.7 mg/L) (SIDS | Based on the NITE GHS classification results. | Based on the NITE GHS classification results. |

Skin corrosion/irritation

| Chemical Name | Skin corrosion irritation source information |
|---------------|---|
| Ethanol | Based on the NITE GHS classification results. |

Serious eyedamage/eye irritation

| Chemical Name | Serious eye damage source information |
|---------------|---|
| Ethanol | Based on the NITE GHS classification results. |

Respiratory or skin sensitization

| Chemical Name | Respiratory, Skin sensitization source information |
|---------------|--|
| Ethanol | Based on the NITE GHS classification results. |

Reproductive cell mutagenicity

| Chemical Name | Mutagenic source information |
|---------------|---|
| Ethanol | Based on the NITE GHS classification results. |

Carcinogenicity

| Chemical Name | Carcinogenicity source information |
|---------------|------------------------------------|
| Ethanol | A3 (ACGIH (7th, 2012)) |

| Chemical Name | NTP | IARC | ACGIH | JSOH (Japan) |
|-----------------|-------|---------|-------|--------------|
| Ethanol 64–17–5 | Known | Group 1 | A3 | – |

Reproductive toxicity

| Chemical Name | Reproductive toxicity source information |
|---------------|---|
| Ethanol | Based on the NITE GHS classification results. |

STOT–single exposure

| Chemical Name | STOT –single exposure– source information |
|---------------|---|
| Ethanol | Based on the NITE GHS classification results. |

STOT–repeated exposure

| Chemical Name | STOT –repeated exposure– source information |
|---------------|---|
| Ethanol | Based on the NITE GHS classification results. |

Aspiration hazard

| Chemical Name | Aspiration Hazard source information |
|---------------|---|
| Ethanol | Based on the NITE GHS classification results. |

12. Ecological Information

Bioaccumulation

| Chemical Name | Algae/aquatic plants | Fish | Crustacea |
|---------------|-------------------------------------|---|------------------------------------|
| Ethanol | EC50: Chlorella alga 1000 mg/L 96 h | LC50: Fathead minnow >100mg/L 96h LC50: Oncorhynchus mykiss =11200ppm 96h | EC50: Daphnia magna 5463 mg/L 48 h |

Persistence and degradability Degree of decomposition: 89 % by BOD

Bioaccumulative potential No information available

Mobility in soil No information available

Hazard to the ozone layer Mobility No information available

13. Disposal considerations**Waste from residues**

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Contaminated container and contaminated packaging

Disposal should be in accordance with applicable regional, national and local laws and regulations.

14. Transport Information

| | | |
|----------------|--|--------------------------|
| ADR/RID | UN number | 1170 |
| | Class | 3 |
| | Proper Shipping Name | Ethanol |
| | Packing group | II |
| | Marine pollutant | Not applicable |
| IMDG | UN number | 1170 |
| | Class | 3 |
| | Proper Shipping Name | Ethanol |
| | Packing group | II |
| | Marine pollutant | Not applicable |
| | MARPOL 73/78 Annex II and liquid substances to be bulk loaded by IBC code | No information available |
| IATA | UN number | 1170 |
| | Class | 3 |
| | Proper Shipping Name | Ethanol solution |
| | Packing group | II |
| | Environmentally Hazardous Substance | Not applicable |

15. Regulatory Information**International Inventories**

| | |
|----------------------|--------|
| EINECS/ELINCS | Listed |
| TSCA | Listed |

Japanese regulations**Law concerning the Examination and Regulation of Manufacture etc. of Chemical Substances**

Regulated. (2)-202

Industrial Safety and Health Act

Notifiable Substances (Law Art.57-2, Enforcement Order Art.18-2 Attached Table No.9)No.61

Dangerous Substances – Flammable Substance (Enforcement Order Attached Table 1 Item4)

Harmful Substances Whose Names Are to be Indicated on the Label (Law Art.57, Para.1, Enforcement Order Art.18)

Poisonous and Deleterious Substances Control Law Not regulated.

Fire Service Law

Category IV, alcohols, dangerous grade 2 water-soluble

Regulations for the carriage and storage of dangerous goods in ship

Flammable Liquids (Ordinance Art.3, Ministry of Transportation Ordinance Regarding Transport by Ship and Storage, Attached Table 1)

Japan PRTR Not regulated.

Civil Aeronautics law

Flammable Liquids (Ordinance Art.194, MITL Notification for Air Transportation of Explosives etc., Attached Table 1)

Japan Marine Pollution Prevention Law

Enforcement ordinance Appendix No. 1 Noxious liquid substance Category Z

16. Other information

GHS classification and labelling

Flam. Liq. 2: H225
Eye Irrit. 2B: H320
Carc. 1A: H350
Repr. 1A: H360
STOT SE 3: H335, H336
STOT RE 1: H372
STOT RE 2: H373

Reference Book

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Classification, labelling and packaging of substances and mixtures (table3-1 ECNO6182012)
JIS Z 7252:2014, JIS Z 7253:2012
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