

## <u>JPS-34U</u>

Version: 2.0 Updated : 2021/06/24

#### 1. IDENTIFICATION OF THE SUBSTANCE OR MIXTURE AND OF THE SUPPLIER

#### 2. HAZARDS IDENTIFICATION

2-1.GHS classification of the substance/mixture and any national or regional GHS classification

Acute Toxicity (Oral) : Category 3 Acute Toxicity (Dermal) : Category 3 Acute Toxicity (Inhalation : vapor) : Category 3 Skin Corrosion / Irritation : Category 2 Serious Eye Damage / Irritation : Category 2 Environmental Toxicity : Category 3 flammable liquids : Category 4

# 2-2. GHS label elements, including precautionary statements

Symbols



Signal word Hazard statements

Precautionary statements Prevention Danger

- H301 Toxic if swallowed
- H311 Toxic in contact with skin
- H315 Causes skin irritation
- H319 Causes serious eye irritation
- H331 Toxic if inhaled
- H412 Harmful to aquatic life with long-lasting effects
- H227 Combustible liquid

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

P264 Wash ... thoroughly after handling.

- P270 Do not eat, drink or smoke when using this product.
- P271 Use only outdoors or in a well-ventilated area.
- P273 Avoid release to the environment.

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

	P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
Response	P301+P310 IF SWALLOWED: Immediately call a POISON CENTER/doctor/
	P302+P352 IF ON SKIN: Wash with plenty of water/
	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.
	P312 Call a POISON CENTER/ doctor//if you feel unwell.
	P311 Call a POISON CENTER/ doctor/
	P321 Specific treatment (see on this label).
	P330 Rinse mouth.
	P332+P313 If skin irritation occurs: Get medical advice/attention.
	P337+P313 If eye irritation persists get medical advice/attention.
	P361+P364 Take off immediately all contaminated clothing and wash it before
	reuse.
	P362+P364 Take off contaminated clothing and wash it before reuse.
	P370+P378 In case of fire: Use to extinguish.
Storage	P403+P233 Store in a well ventilated place. Keep container tightly closed.
	P405 Store locked up.
	P403 Store in a well ventilated place.
Disposal	P501 Dispose of contents/container to
2-3 NFPA	
Health	4
Fire	2
Reaction	0

## **3. COMPOSITION/INFORMATION ON INGREDIENTS**

Composition	Synonym	CAS No	wt %
Tetramethylammoium hydroxide	ТМАН	75-59-2	1.0 ~ 10.0
Proprietary Solvent	-	Proprietary	50.0 ~ 60.0
2-butoxyethanol	BUTYL CELLUSOLVE	111-76-2	25.0 ~ 35.0
Proprietary Additive	-	Proprietary	10.0 ~ 15.0
Proprietary Additive	_	Proprietary	1.0 ~ 10.0

## 4. FIRST-AID MEASURES

4.1 Eye contact	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.
4.2 Skin contact	IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
	IF skin irritation occurs: Get medical advice/attention.
	Remove contaminated clothing and shoes and please isolate the contaminated area.
	IF burned : Cool molten material adhering to skin as quickly as possible with water,
	and Do not remove clothes.
	IF ON SKIN: Wash with plenty of soap and water.
4.3 Inhalation	Get medical advice/attention.
	IF breathed in, move person into fresh air. If not breathing, give artificial respiration.
	Consult a physician.
4.4 Ingestion	IF exposed or concerned: Get medical advice/attention.
_	Rinse mouth.
	If the substance is ingested or inhaled, do not breathe artificially using oral oral

Treatment of over exposure should be directed at the control of symptoms and the clinical condition of the patient.

#### **5. FIRE-FIGHTING MEASURES**

5-1. Suitable extinguishing media	Alcohol foam, carbon dioxide or water spray
5-2. Specific hazards arising from the chemical	Thermal decomposition or combustion during water burning can cause irritating and highly toxic gases.
	Heating may cause an container explosion.
	Some burnable but not easily ignited.
	Non-flammable, material itself does not burn, but may decompose during heating,
	resulting in corrosive/toxic fume.
5-3. Special precautions for fire-fighters	Wear protective equipment.
	Leave the area and extinguish fire in safe range.
	Outflow substance may cause pollution.
	Causes severe skin burns and eye damage.
	In case of fire: : If not danger, remove containers.
	Never add water to containers.

## 6. ACCIDENTAL RELEASE MEASURES

6-1. Personal precautions, protective equipment and emergency procedures	Avoid inhalation of fume, gas, mist, steam, spray. Remove all ignition sources.
	Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations.
	Separate the contaminated area. Ground/bond container and receiving equipment. If not danger, stop to leak.
	If no protective equipment, do not touch exposure material and container. Can use vapor suppression foam to reduce vapor production.
6-2. Environmental precautions	Do not let products flow in waterway, drain basement, and sealed room.
6-3. Methods and materials for containment	Soak up with inert absorbent material and dispose of as hazardous waste.
	Absorbed exposed materials with inactivity material(dry sand and soil) and place in a container for proper disposal.
	Alter absorbed exposed materials, clean up with cleaner and water.

#### 7. HANDLING AND STORAGE

7-1. Precautions for safe handling	Do not handle until all safety precautions have been read and understood. Avoid inhalation of fume, gas, mist, steam, spray. Avoid getting any stains on your eyes, skin or clothing. Wash thoroughly after handling. Do not eat, drink or smoke in areas of use or storage Store and use with adequate ventilation. Follow all MSDS/Label precautions as product debris may remain after the container has been emptied. Store and use with adequate ventilation. Open the cover carefully before use Do not contact with skin for a long time. Be aware of substances and conditions to avoid.
	Be ware of high temperatures.

#### 7-2. Conditions for safe storage, including

any incompatibilities

Keep container tightly closed in well-ventilated area.

Store in anti-corrosion container which is decided by manufacturer or government.

Keep away from food and drink.

#### 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8-1. Control parameters	
Domestic regulations	
Tetramethylammoium hydroxide	TWA - 1mg/m3
Proprietary Solvent	No data available
2-butoxyethanol	TWA - 20mg/m3
Proprietary Additive	TWA - 10mg/m3
Proprietary Additive	No data available
ACGIH regulations	
Tetramethylammoium hydroxide	No data available
Proprietary Solvent	No data available
2-butoxyethanol	TWA - 20mg/m3
Proprietary Additive	No data available
Proprietary Additive	No data available
Biological exposure	
Tetramethylammoium hydroxide	No data available
Proprietary Solvent	No data available
2-butoxyethanol	No data available
Proprietary Additive	No data available
Proprietary Additive	No data available
8-2. Appropriate engineering controls	Keep air pollution under exposure standard when occur fume or mist in handle.
	Set up washing/shower system.
8-3 Individual protection measures	

8-3. Individual protection measures

Use proper respiratory, eye, hand, skin, and body protection

### 9. PHYSICAL AND CHEMICAL PROPERTIES

	9-1. Appearance	
	Physical state	Transparent Liquid
	Color	Pale yellow
	9-2. Odor	Specific amine odo
	9-3. Odor threshold	No data available
	9-4. pH	12.6 (10% aq. soln.)
	9-5. Melting point/freezing point	No data available
	9-6. Initial boiling point and boiling range	180℃
	9-7. Flash point	72℃
	9-8. Evaporation rate	No data available
	9-9. Flammability(solid, gas)	No data available
	9-10. Upper flammability or explosive	No data available
li	mits	
	9-11. Vapour pressure	No data available
	9-12. Solubility	100% (water)
	9-13. Relative density	No data available
	9-14. Specific gravity	1.05
	9-15. Partition coefficient : n-	No data available
	9-16. Auto-ignition temperature	No data available

## **10. STABILITY AND REACTIVITY**

10.1 Chamical stability and possibility of	Elammable liquid and vanour
10-1. Chemical stability and possibility of	
hazardous reactions	loxic gas occur by decomposition in high temperature.
	As flammable Liquid, it can release vapors that form explosive mixtures at
	temperatures above the flash point.
	Container can be exploded when heated.
	May be corrosive to metals.
	May occur flammable hydrogen gases if contact with metals.
	Can occur corrosive/toxic fume in fire
	IF on inhalation, ingestion, skin contact : toxic. serious injury or death.
	IF on skin and eyes : Causes severe skin burns and eye damage
10-2. Condition to avoid (electrostatic	
discharge, shock, vibration, etc)	Ignition source : Heat, Spark, Flames, Hot surfaces
10-3. Incompatible materials	Metal, Combustible materials, Reducing agents, Irritation, Toxic gas
10-4. Decomposition products	Irritation or toxic gases may be occurred for combustion.

## **11. TOXICOLOGICAL INFORMATION**

11-1. Information on the likely routes of exposure	irritation, dyspnea
	fever, nausea, vomiting, diarrhea, headache, dizziness, sleep disturbance, blood disorders,
	Can be absorbed by body : Skin, inhalation of vapor and aerosol, digestive system
	IF on skin : burns, serious injury or death.
11-2. Health hazards information	
Acute toxicity Oral Tetramethylammoium hydroxide	(ATE mix) LD50 282mg/kg
, ,	LD50 7.5 ~ 50 mg/kg Rat (Female (OECD IG 423, GLP))
Proprietary Solvent 2-butoxyethanol Proprietary Additive Proprietary Additive Dermal Tetramethylammoium hydroxide Proprietary Solvent 2-butoxyethanol Proprietary Additive Proprietary Additive Inhalation Tetramethylammoium hydroxide	LD50 28300 mg/kg R LD50 1414 mg/kg Guinea pig (OECD TG 401, GLP) LD50 27000 mg/kg Rat LD50 90000 mg/kg Rat (LD50 > 90 ml/kg (Rat)) ( <i>ATE mix</i> ) <i>LD50 2,602mg/kg</i> LD50 25 ~ 50 mg/kg Rat (OECD TG 402, GLP) LD50 40000 mg/kg Rat LD50 > 2000 mg/kg Rat No data available No data available
	No data available
Proprietary Solvent 2-butoxyethanol Proprietary Additive Proprietary Additive Skin corrosion/irritation	No data available Vapor LC50> 7.4 mg/l 7 hr Rat Vapor LC50> 2.75 mg/l 4 hr Rat No data available

Tetramethylammoium hydroxide	Strong irritation or corrosion to the eye.
Proprietary Solvent 2-butoxyethanol	Edema score: 0/4, Slight irritability, Rabbit, OECD TG 404 According to the skin irritation test using rabbits, erythema stimulation 2 is sufficient to determine that it is irritating even though not applicable to GHS standards. EU Method B.4
Proprietary Additive	No irritation as a result of skin corrosion/stimulation experiment using rabbit
Proprietary Additive Eye irritation	Not applicable
Tetramethylammoium hydroxide	Skin corrosion Category 1
Proprietary Solvent	OECD TG 405
2-butoxyethanol	OECD TG405, GLP
Proprietary Additive	No irritation, Rabbit
Proprietary Additive	Not applicable
Sensitization - Respiratory	
Tetramethylammoium hydroxide	
	No data avallable
Proprietary Solvent	No data available
2-butoxyethanol	No data available
Proprietary Additive	No data available
Proprietary Additive	No data available
Skin reaction	
Tetramethylammoium hydroxide	No data available
Proprietary Solvent	DPM, OECD TG 429
2-butoxyethanol	OECD TG 406
Proprietary Additive	No data available
Proprietary Additive	No data available
Carcinogenic	
Occupation safety and health acts	
Tetramethylammoium	No data available
Proprietany Solvent	No data available
	No data available
Proprietary Additive	No data available
Proprietary Additive	No data available
Regulations of the Ministry of	
Employment and Labor	
Tetramethylammoium	No data available
hydroxide	
Proprietary Solvent	No data available
2-butoxyethanol	No data available
Proprietary Additive	No data available
Proprietary Additive	No data available
IARC	
Ietramethylammoium	No data available
hydroxide	
Proprietary Solvent	
Proprietary Additive	

Proprietary Additive	No data available
OSHA	
Tetramethylammoium hydroxide	No data available
Proprietary Solvent	No data available
2-butoxyethanol	No data available
Proprietary Additive	No data available
Proprietary Additive	No data available
ACGIH	
Tetramethylammoium	No data available
hydroxide	
Proprietary Solvent	No data available
2-butoxyethanol	No data available
Proprietary Additive	No data available
Proprietary Additive	No data available
NTP	
Tetramethylammoium	No data available
hydroxide	
Proprietary Solvent	No data available
2-butoxyethanol	No data available
Proprietary Additive	No data available
Proprietary Additive	No data available
EU CLP	
Tetramethylammoium	
hydroxide	No data available
Proprietary Solvent	No data available
2-butoxyethanol	No data available
Proprietary Additive	No data available
Proprietary Additive	No data available
Germ cell mutagenicity	
Tetramethylammoium	In vitro mammal (Chinese hamster) chromosomal aberration test shows negative
bydroxide	(OECD TG 473, GLP) with or without metabolic activity
nyaroxide	As a result of the return mutation test using microorganisms in the test tube it is
	negative (OECD TG 471, GLP) with an without metabolic activity
	In vitro genetic mutation test results show negative (OECD TG 476, GLD) with or
	In vito genetic indiation test results show negative (OECD 19 470, GEP) with or
	without metabolic activity.
Proprietary Solvent	invitro - return mutation test using bacteria: negative (TA97, TA98, TA100, TA1535,
	TA1537, irrespective of metabolic activity), OECD TG 471
2-butoxyethanol	OECD TG471 using microorganisms in vitro, chromosome abnormality test using
,	mammalian cells, OECD TG473 results negative, and OECD TG474 results negative in
	vivo mammalian bone marrow cells
Proprietany Additive	invitro - a return mutation test using bacteria: negative (regardless of S. tynimurium
Tophetary Additive	TA1E2E TA1E27 TA09 TA100 motobalic activity)
<b>-</b>	TAT555, TAT557, TA96, TAT00, Iffelabolic activity)
Proprietary Additive	Not applicable
Reproduction-toxicity	
Tetramethylammoium	Reproductive toxicity tests show saliva secretion, decreased exercise activity,
hydroxide	difficulty opening and closing eyelids, loss of hair, and weight loss in females
	(NOAEL = 5 mg/kg bw/day). 18% mortality in 20 mg/kg group in F1 (NOAEL = 20
	mg/kg bw/day) (OECD Guideline 421, GLP) Not considered for reproductive toxicity-
	related effects
Proprieton, Solvent	No data available
Fiophetaly solvent	

	2-butoxyethanol	Generation 2 gen genital toxicity test (NTP) results showed NOAEL (Parent Toxic)=720 mg/kg bw/day due to weight loss, reproductive function, and NOAEL (F1, F2)=720 mg/kg bw/day due to infant weight loss, no effect on reproductive toxicity was observed. No developmental toxicity or malformation effects were observed as a result of the developmental toxicity test (OECD TG414) using rats NOAEL=100 mg/kg bw/day, NOAEL>200 mg/kg bw/day
	Proprietary Additive	Oral gastroscopic nutrition in male and female rats over two generations did not affect the growth, reproduction and reproductive function through the second generation as a result of exposure time. One female rat's offspring did not affect developmental toxicity rat
Specifi	Proprietary Additive	Not applicable
(single expo	isure)	
	Tetramethylammoium hydroxide	Acute oral toxicity tests using rats show coma, sagging eyelids, difficulty breathing, poor exercise, reduced body temperature, reduced moisture in nose and mouth, dead mice observed stomach abnormalities (OECD TG 425, GLP)
		Acute percutaneous toxicity tests using rats show squatting, hypertrophy, crooked posture, irregular breathing, decreased breathing speed, narrow eyelid cracking, decreased activity, numbness in male rats at 400 mg/kg. Exaggerated walking, slanted posture, irregular breathing, decreased breathing speed, decreased activity, narrow eyelid cracking, coat bristling, colorless enteric eye discharge, numbness, corneal reflex delay, ductile and hepatic cramps were observed in females. Not applied to classification in this category due to decreased activity, irregular breathing, narrow eyelid cracking, cramps observation (OECD TG 402, GLP) acute toxicity effects at 500 mg/kg bw
	Proprietary Solvent	No data available
	2-butoxyethanol	Mouse-based respiratory stimulation test indicates RD502818 ppm is not minimum or sensory stimulation
	Proprietary Additive Proprietary Additive	No data available Not applicable
Speciti	c target organ toxicity	
(repeated ex	xposure) Tetramethylammojum	
	hydroxide	No data available
	Proprietary Solvent	No data available
	2-butoxyethanol	A 90-day repeated oral toxicity test using rats showed slight cytoplasm abnormalities in liver and tissue pathology, but no harmful effects were observed. NOAEL <69 mg/kg bw/day, NOAEL
	Proprietary Additive	No data available
Aspira	Proprietary Additive tion Hazard	Not applicable
	Tetramethylammoium	No data available
	Proprietary Solvent	No data available
	2-butoxyethanol Proprietany Additive	No data available
	Proprietary Additive	No data available
Other	Hazard	
	Tetramethylammoium hydroxide	No data available
	Proprietary Solvent	No data available

2-butoxyethanol Proprietary Additive Proprietary Additive No data available No data available No data available

## **12. ECOLOGICAL INFORMATION**

12-1. Ecot	oxicity	
Fish	-	
	2-butoxyethanol	LC50 1474 mg/ł 96 hr Oncorhynchus mykiss (OECD Guideline 203)
	Proprietary Additive	LC50 54000 mg/l 96 hr Oncorhynchus mykiss
	Proprietary Solvent	LC50 > 25 g/ł 24 hr Danio rerio
	Tetramethylammoium	1 C50 462 mail 96 hr Pimenhales prometas (OECD Guideline 203)
hydroxide		Leso 402 mg/t so in timephales prometas (oleo Galacime 203)
	Proprietary Additive	No data available
Shellf	ish	
	2-butoxyethanol	EC50 1800 mg/ł 48 hr Daphnia magna (OECD TG 202)
	Proprietary Additive	LC50 1955 mg/ł 48 hr Daphnia magna
	Proprietary Solvent	EC50 24.6 g/ł 48 hr Daphnia magna
	Tetramethylammoium	EC50 3 mg/ $\ell$ 48 hr Daphnia magna (OECD Guideline 202, GLP)
hydroxide	Duan viatan ( A daliti ya	No data available
Algac	Proprietary Additive	
Algae	2-butoxvethanol	EC50 911 mg/l 72 hr Selenastrum capricornutum (OECD TG 201)
	Proprietary Additive	EC3 > 10000  mg/l 8  day Scenedesmus guadricauda
	Proprietary Solvent	$FC50 \ 17 \ g/l \ 72 \ hr \ Pseudokirchneriella subcapitata$
	Tetramethylammojum	ErC50 96.3 mg/l 72 hr other (Pseudokirchneriella subcapitata, OECD Guideline 201
hvdroxide	readinearylanniolann	GLP)
	Proprietary Additive	No data available
12-2. Pers	istence and degradability	
Persis	tence	
	2-butoxyethanol	log Kow 0.81 (25 °C, pH=7, BASF standard method)
	Proprietary Additive	01 -1.75 log Kow
	Proprietary Solvent	01 -1.35 log Kow
hydroxide	Tetramethylammoium	log Kow -2.47 (estimation)
	Proprietary Additive	log Kow -1.38
Degra	adability	
	2-butoxyethanol	No data available
	Proprietary Additive	BOD5/COD COD, TOC 0hr 0%, 0%, 2hr 14%, 18%, 4hr 32%,
	Description Calment	38%, 24hr : 92%, 93%
	Proprietary Solvent	after the start of the study
	Tetramethylammojum	after the start of the study.
hydroxide	renamenyianinoidin	No data available
nyaroxiae	Proprietary Additive	No data available
12-3. Bioa	ccumulative potential	
Bioc	oncentration	
	2-butoxyethanol	No data available
	Proprietary Additive	01 3 BCF
	Proprietary Solvent	01 3.16 BCF
	Tetramethylammoium	
hydroxide		BCL 2
	Proprietary Additive	No data available
Biod	egradability	
	2-butoxyethanol	90.4 % 28 day (OECD TG 301G)

	Proprietary Additive	60 01 2 hr
	Proprietary Solvent	0 01 0 day
	Tetramethylammoium	100 % 28 day (Ready biodegradability test, OECD Guideline
hydroxide		301 B, GLP)
	Proprietary Additive	No data available
12-4. Mo	bility in soil	
	2-butoxyethanol	No data available
	Proprietary Additive	No data available
	Proprietary Solvent	No data available
	Tetramethylammoium	No data available
hydroxide		
	Proprietary Additive	No data available
12-5. Oth	ner adverse effects	
	2-butoxyethanol	Fish Danio rerio: NOEC14d>100 mg/L OECD TG 204
	Proprietary Additive	No data available
	Proprietary Solvent	No data available
	Tetramethylammoium	Shellfish:Daphnia magna, NOEC, 11d, = $30\mu$ g/L, EPA/600/4-85/014, GLP,
hydroxide		Algae:Pseudokirchneriella subcapitata, NOEC, 72h, = 6.25mg/L, OECD Guideline 201,
	Proprietary Additive	No data available
12-6. Ozo	one Layer Hazard	Not applicable

### **13. DISPOSAL CONSIDERATIONS**

13-1. Methods of disposal 13-2. Caution of disposal

Follow federal, state and local regulations. Consider the notice in regulations.

### **14. TRANSPORT INFORMATION**

14-1. IMDG Code (UN No.)	2922		
14-2. Shipment name	Corrosive liquids, toxic, n.o.s.		
14-3. Packing	8, 6.1		
14-4. Container grade	П		
14-5. Marine pollutant	No data available		
Special precaution which a user to be aware of or needs to comply with in connection with			
Fire	F-A		
Leak	S-B		

## **15. REGULATORY INFORMATION**

15-1. The regulation by the industry Safety and Health Act

	Hazardous materials : 2-butoxyethanol
	Working environment measurement materials (period : 6 month) : 2-butoxyethanol Special Medical Examination materials (period : 12 month) : 2-butoxyethanol
	Exposure standard materials : : 2-butoxyethanol
1E 2. The regulation by the hazardous	Not applicable
15-2. The regulation by the Dangerous	
Goods	4 class third petroleum (water soluble) 4000ℓ
Safety Management Act	
15-4. Regulation by the Waste	Specified waste
Management Act	Specified waste
15-5. Regulations by other domestic and	
foreign law Domestic regulatory	
Domestic regulatory	
Persistent organic pollutant	Not applicable
management system	

Foreign regulatory	
OSHA regulation	Not applicable
CERCLA regulation	Not applicable
EPCRA 302 regulation	Not applicable
EPCRA 304 regulation	Not applicable
EPCRA 313 regulation	Not applicable
Rotterdam Convention material	Not applicable
Stockholm Convention material	Not applicable
Montreal Protocol material	Not applicable
EU classify information (Confirmation classification results)	Acute Tox. 3 * Acute Tox. 3 * Acute Tox. 3 * Skin Irrit. 2 Eye Irrit. 2
EU classify information (Risk phrases)	H331 H311 H301 H315 H319
EU classify information (Safety phrases)	Not applicable

## **16. OTHER INFORMATION**

16-1. Source of data	
	HSDB
	IARC
	ACGIH
	IUCLID
	SIDS
	NLM
	OECD SIDS
	EU IUCLID
	NITE
	ICSC
	MERCK
16-2. Initial reported date	2016-10-11
16-3. Revision No.	
Revision No.	2 times
최종 개정일자	2021-06-24
16-4. Others	

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