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SECTION 1. IDENTIFICATION

Product name	:	L(+)-Lactic Acid 80%
Substance name	:	L(+)-lactic acid aqueous solution 80%
Trade name	:	L(+)-Lactic Acid 80%
Molecular formula	:	C3-H6-O3
Chemical identity	:	S(+)-2-Hydroxypropanoic acid
CAS-No.	:	79-33-4
Chemical nature	:	Liquid

Manufacturer or supplier's details

Details of the supplier of the safety data sheet

Company	:	Jungbunzlauer Inc. 95 Wells Avenue, Suite 150 Newton, Massachusetts 02459 USA www.jungbunzlauer.com
Telephone	:	+1 617 969-0900
Telefax	:	+1 617 964-2921
E-mail address Responsi- ble/issuing person	:	msds@jungbunzlauer.com

Emergency telephone number

National Chemical Emergency Centre (NCEC) +1 202 464 2554

Recommended use of the chemical and restrictions on use

Recommended use	: Food additive Personal care Cleaning agent Biocidal product Industrial use Pharmaceutical raw material

Restrictions on use

: None known.

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)

Skin corrosion : Category 1

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Serio	us eye damage	: Category 1	
	label elements rd pictograms		
Signa	al word	: Danger	
Haza	rd statements	: H314 Causes severe skin burns and eye dan	nage.
Preca	autionary statements	: Prevention: P260 Do not breathe vapours. P264 Wash skin thoroughly after handling. P280 Wear protective gloves/ protective cloth face protection.	ning/ eye protection/
		 Response: P301 + P330 + P331 IF SWALLOWED: Rinsinduce vomiting. P303 + P361 + P353 IF ON SKIN (or hair): Tall contaminated clothing. Rinse skin with wa P304 + P340 + P310 IF INHALED: Remove pand keep comfortable for breathing. Immediat CENTER/ doctor. P305 + P351 + P338 + P310 IF IN EYES: Rinwater for several minutes. Remove contact leand easy to do. Continue rinsing. Immediatel CENTER/ doctor. P363 Wash contaminated clothing before reu 	ake off immediately ter/ shower. person to fresh air tely call a POISON nse cautiously with enses, if present y call a POISON
		Storage: P405 Store locked up.	
		Disposal: P501 Dispose of contents/ container to an ap posal plant.	proved waste dis-

Hazards Not Otherwise Classified

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture	:	Mixture

Chemical nature : Liquid

Hazardous components

Chemical name	CAS-No.	Concentration (% w/w)
L(+)-lactic acid	79-33-4	>= 70 - < 90

Non-hazardous ingredients

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Chemical name	CAS-No.	Concentration (% w/w)
H2O	7732-18-5	>= 19.5 - <= 20.5

SECTION 4. FIRST AID MEASURES

General advice	:	Move out of dangerous area. Consult a physician. Show this safety data sheet to the doctor in attendance. Do not leave the victim unattended.
If inhaled	:	If breathed in, move person into fresh air. No artificial respiration, mouth-to-mouth or mouth to nose. Use suitable instruments/apparatus.
		If unconscious, place in recovery position and seek medical advice. If symptoms persist, call a physician.
In case of skin contact	:	Immediate medical treatment is necessary as untreated wounds from corrosion of the skin heal slowly and with difficul- ty. If on skin, rinse well with water. If on clothes, remove clothes.
In case of eye contact	:	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.
		Small amounts splashed into eyes can cause irreversible tis- sue damage and blindness. In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Continue rinsing eyes during transport to hospital. Remove contact lenses. Protect unharmed eye. Keep eye wide open while rinsing. If eye irritation persists, consult a specialist.
If swallowed	:	Clean mouth with water and drink afterwards plenty of water. Keep respiratory tract clear. Do NOT induce vomiting. Do not give milk or alcoholic beverages. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician. Take victim immediately to hospital.
Most important symptoms and effects, both acute and delayed	:	Severe eye irritation Erythema Skin disorders Causes serious eye damage. Causes severe burns.
Protection of first-aiders	:	Wear personal protective equipment.
Notes to physician	:	Treat symptomatically.

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SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media	:	Water mist Dry powder Carbon dioxide (CO2) Foam
Unsuitable extinguishing media	:	High volume water jet
Specific hazards during fire- fighting	:	Exposure to decomposition products may be a hazard to health.
		Do not allow run-off from fire fighting to enter drains or water courses.
Hazardous combustion prod- ucts	:	Carbon monoxide, carbon dioxide and unburned hydrocar- bons (smoke).
Further information	:	Standard procedure for chemical fires. Use water spray to cool unopened containers. In the event of fire and/or explosion do not breathe fumes.
		Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
Special protective equipment for firefighters	:	Use personal protective equipment.
		Wear self-contained breathing apparatus for firefighting if nec- essary.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protec- : tive equipment and emer- gency procedures	:	Material can create slippery conditions. Use personal protective equipment.
Environmental precautions :	:	Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. If the product contaminates rivers and lakes or drains inform respective authorities.
Methods and materials for : containment and cleaning up	:	Clean contaminated surface thoroughly.
		Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Keep in suitable, closed containers for disposal.

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SECTION 7. HANDLING AND STORAGE

Technical measures	:	Avoid temperatures above 200°C.
Local/Total ventilation	:	Ensure adequate ventilation, especially in confined areas.
Advice on protection against fire and explosion	:	Normal measures for preventive fire protection.
Advice on safe handling	:	Do not breathe vapours/dust. Avoid contact with skin and eyes. For personal protection see section 8. Smoking, eating and drinking should be prohibited in the ap- plication area. To avoid spills during handling keep bottle on a metal tray. Dispose of rinse water in accordance with local and national regulations.
Conditions for safe storage	:	Keep in an area equipped with acid resistant flooring. Store in original container.
		Keep container tightly closed in a dry and well-ventilated place. Observe label precautions. Electrical installations / working materials must comply with the technological safety standards.
Further information on stor- age conditions	:	Keep away from direct sunlight.
Materials to avoid	:	Incompatible with bases.
Recommended storage tem- perature	:	> 41 °F
Further information on stor- age stability	:	No decomposition if stored and applied as directed.
Packaging material	:	Suitable material: Plastic container of HDPE, Stainless steel 316L

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workpla Contains no substances with		ontrol parameters supational exposure limit values.
Engineering measures	:	Ensure adequate ventilation, especially in confined areas.
Personal protective equip	ment	t i i i i i i i i i i i i i i i i i i i
Respiratory protection	:	No personal respiratory protective equipment normally re- quired.
		In the case of vapour formation use a respirator with an ap-

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		proved filter. Use NIOSH a	approved respiratory protection.
Hand	protection		
Re	emarks	The suitability	e gloves tested to EN374. y for a specific workplace should be discussed ucers of the protective gloves.
Eye p	rotection	to the workst Safety glasse Eye wash bo Tightly fitting	eyewash stations and safety showers are close ation location. as with side-shields ttle with pure water safety goggles iield and protective suit for abnormal processing
Skin a	and body protection	Long sleeved Footwear pro Impervious cl Choose body	tecting against chemicals
Hygie	ne measures	practice. Take off all c Wash contan When using c When using c	cordance with good industrial hygiene and safety ontaminated clothing immediately. hinated clothing before re-use. do not eat or drink. do not smoke. before breaks and at the end of workday.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance Colour	:	Aqueous solution, viscous colourless, light yellow
Odour	:	characteristic
Odour Threshold	:	Not relevant
рН	:	< 2 (77 °F / 25 °C)
Melting point/freezing point	:	< -112 °F / < -80 °C (ca. 1,013.25 hPa)
Boiling point/boiling range	:	230 - 266 °F / 110 - 130 °C
Flash point	:	Not applicable
Evaporation rate	:	Not applicable
Flammability (solid, gas)	:	Not applicable

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	Flamma	ability (liquids)	:	Not applicable	
		explosion limit / Upper bility limit	:	Not applicable	
	Lower e flamma	explosion limit / Lower bility limit	:	Not applicable	
	Vapour	pressure	:	ca. 0.038 Pa (68	°F / 20 °C)
	Relative	e vapour density	:	No data available	2
	Density	,	:	1.0 - 1.3 g/cm3	
	Solubili Wat	ty(ies) er solubility	:	completely misci	ble
	Partitio octanol	n coefficient: n- /water	:	log Pow: -0.54 (6	8 °F / 20 °C)
	Auto-ig	nition temperature	:	752 °F / 400 °C	
	Decom	position temperature	:	No data available	9
	Viscosi Visc	ty :osity, dynamic	:	18.4 mPa.s (77 °	F / 25 °C)
	Visc	osity, kinematic	:	No data available	9
	Explosi	ve properties	:	Not applicable	
	Oxidiziı	ng properties	:	Not applicable	
	Surface	e tension	:	70.7 mN/m, 1 g/l	, 68 °F / 20 °C
	Metal c	orrosion rate	:	Not corrosive to	metals

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	No decomposition if stored and applied as directed.
Chemical stability	:	No decomposition if stored and applied as directed.
Possibility of hazardous reac- tions	:	No decomposition if stored and applied as directed.
Conditions to avoid	:	Temperature > 200 °C
Incompatible materials	:	Bases Oxidizing agents
Hazardous decomposition products	:	Build-up of dangerous/toxic fumes possible in cases of fire/high temperature. Carbon dioxide (CO2)

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		Carbon mono	xide
ECTION	11. TOXICOLOGICA		
	e toxicity assified based on ava	ailable information	
	onents:		
	actic acid:		
	oral toxicity	Test substance	t, female): 3,543 mg/kg e: Lactic acid The substance or mixture has no acute oral tox
		Test substance	it, male): 4,936 mg/kg e: Lactic acid The substance or mixture has no acute oral tox
Acute	inhalation toxicity	Exposure time Test atmosphe Test substanc Assessment: 1	ere: vapour
Acute	dermal toxicity	Test substance	(Rabbit): 2,000 mg/kg e: Lactic acid The substance or mixture has no acute dermal
Skin d	corrosion/irritation		
Cause	es severe burns.		
<u>Prodι</u> Rema		: Extremely corr	osive and destructive to tissue.
Comp	oonents:		
L(+)-la	actic acid:		
Asses Resul	sure time ssment		r 1 to 4 hours of exposure r 1 to 4 hours of exposure
	us eye damage/eye es serious eye dama <u>c</u>		
<u>Prodι</u> Rema	<u>ict:</u>		eversible eye damage.

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Components:

L(+)	-lactic	acid:
------	---------	-------

Species	:	chicken
Result	:	Severe irritation
Test substance	:	Lactic acid

Respiratory or skin sensitisation

Skin sensitisation

Not classified based on available information.

Respiratory sensitisation

Not classified based on available information.

Components:

L(+)-lactic acid:

Species	:	Guinea pig
Result	:	Does not cause skin sensitisation.

Germ cell mutagenicity

Not classified based on available information.

Components:

L(+)-lactic acid:

Germ cell mutagenicity -	:	In vitro tests did not show mutagenic effects
Assessment		

Carcinogenicity

Not classified based on available information.

Components:

L(+)-lactic aci Species Result Test substance	Rat, male and femaleAnimal testing did not show any carcinogenic effects.				
IARC	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.				
OSHA	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.				
NTP	No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.				

Reproductive toxicity

Not classified based on available information.

0				
Comp	onents:			
L(+)-la	ictic acid:			
STOT	- single exposure			
Not cla	assified based on ava	ilable	information.	
Comp	<u>onents:</u>			
L(+)-la Assess	a ctic acid: sment	:	No data availab	le
	- repeated exposure		information	
	onents:	inabic	information.	
	ictic acid:			
Assess		:		or mixture is not classified as specific targe repeated exposure.
Repea	ted dose toxicity			
Comp	<u>onents:</u>			
L(+)-la	ictic acid:			
Specie		:	Rat	
	- ation Route	:	886 mg/kg Dermal	
	ure time	:	13 wk	
	er of exposures	÷	5 d/wk	
Dose		÷	886 mg/kg bw	
	ubstance	:	Lactic acid	
Assess	sment	:	slight irritation	
Specie		:	Rat, female	
NOAE		:	50,000 mg/l	
	ation Route	÷	Oral 13 wk	
	ure time er of exposures		13 WK 1/d	
Dose		:	5%	
	ubstance	÷	Calcium lactate	
Assess		:	No adverse effe	ects
-	ation toxicity assified based on ava	ilable	information.	
<u>Comp</u>	onents:			
L(+)-la	ictic acid:			
• •	a available			

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Expe	rience with human e	xposu	ire	
Produ	uct:			
Inhala	ation	:		Respiratory system nformation available.
Skin o	contact	:	Target Organs: S Symptoms: May	Skin cause skin irritation in susceptible persons.
Еуе с	ontact	:	Target Organs: E Symptoms: Redr	
Inges	tion	:	Target Organs: I Symptoms: No ir	Digestive organs nformation available.
Furth	er information			
<u>Produ</u>			NI. 1.4	
Rema	Irks	:	No data available	9

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity		
Components:		
L(+)-lactic acid:		
Toxicity to fish	:	LC50 (Oncorhynchus mykiss (rainbow trout)): 130 mg/l Exposure time: 96 h Test substance: Lactic acid Remarks: Not classified
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 130 mg/l End point: Immobilization Exposure time: 48 h Test substance: Lactic acid Remarks: Not classified due to data which are conclusive although insufficient for classification.
Toxicity to algae/aquatic plants	:	EC50 (Pseudokirchneriella subcapitata (algae)): > 2,800 mg/l Exposure time: 72 h Test substance: Lactic acid Remarks: Not classified due to data which are conclusive although insufficient for classification.
		NOEC (Pseudokirchneriella subcapitata (green algae)): 1,900 mg/l Exposure time: 70 h Test substance: Lactic acid Remarks: Not classified due to data which are conclusive although insufficient for classification.
Toxicity to fish (Chronic tox- icity)	:	LOEC (Fish (Oreochromus mossambica)): ca. 2.18 mg/l Exposure time: 90 d

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			Test substance: L Remarks: Enviror nario is not releva	nmental exposure assessment for this sce-
Toxici	ty to microorganisms	:	Exposure time: 3 Test Type: Respin Test substance: L Remarks: Not cla	ration inhibition
Toxici isms	ty to terrestrial organ-	:	LC50 (Colinus vir Exposure time: 14 Test substance: L	
Persis	stence and degradabil	lity		
Comp	onents:			
L(+)-la	actic acid:			
Biode	gradability	:	Closed Bottle test Inoculum: activate Biochemical oxyg Biodegradation: a Exposure time: 28 Method: OECD T Test substance: L Remarks: Readily	ed sludge en demand 80 % 3 d est Guideline 301 .(+)-Lactic acid
			Ready biodegrad Method: QSAR Test substance: L Remarks: Readily	actic acid
Stabili	ty in water	:	Remarks: Not app	blicable
Bioac	cumulative potential			
Comp	onents:			
	actic acid:			
Bioaco	cumulation	:	•	oduct is miscible in water and readily biode- water and soil. Accumulation is not expected.
	on coefficient: n- bl/water	:	log Pow: -0.54 (68	8 °F / 20 °C)
Mobili	ity in soil			
Comp	onents:			
L(+)-la Mobilit	actic acid: ty	:		on, Mackay Level III Fugacity Model lease, disperses through ground water.

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		ution among environ- compartments	:	Koc: < 20.9, log k Method: OECD T Remarks: Lactic a	est Guideline 121
S	Stability	y in soil	:	Remarks: Readily	/ biodegradable.
С	Other a	adverse effects			
<u>P</u>	Produc	<u>>t:</u>			
C)zone-	Depletion Potential	:	tection of Stratos Substances Remarks: This pr tured with a Class	FR Protection of Environment; Part 82 Pro- oheric Ozone - CAA Section 602 Class I oduct neither contains, nor was manufac- s I or Class II ODS as defined by the U.S. otion 602 (40 CFR 82, Subpt. A, App.A + B).
	Addition nation	nal ecological infor-	:	No data available	
<u>C</u>	Compo	onents:			
L	.(+)-la	ctic acid:			
	Results Issess	s of PBT and vPvB ment	:	This substance is lating and toxic (F	not considered to be persistent, bioaccumu- PBT).
	Addition nation	nal ecological infor-	:	No data available	

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods Waste from residues	:	In accordance with local and national regulations.
		Do not dispose of waste into sewer. Do not contaminate ponds, waterways or ditches with chemi- cal or used container. Send to a licensed waste management company.
Contaminated packaging	:	Empty remaining contents. Dispose of as unused product. Do not re-use empty containers.

SECTION 14. TRANSPORT INFORMATION

International Regulations

IATA-DGR		
UN/ID No.	:	UN 3265
Proper shipping name	:	Corrosive liquid, acidic, organic, n.o.s. (lactic acid)

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Labels Packin aircraft	g instruction (cargo) g instruction (passen-	:	8 III Class 8 - Corrosiv 856 852	ve substances
Class Packin Labels EmS C Marine	nber shipping name g group		UN 3265 CORROSIVE LIQ (lactic acid) 8 III 8 F-A, S-B no	UID, ACIDIC, ORGANIC, N.O.S.

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

Not applicable for product as supplied.

National Regulations

_ _ _

DOT		
UN/ID/NA number :	ι	JN 3265
Proper shipping name :		Corrosive liquid, acidic, organic, n.o.s. (lactic acid)
Class :	8	3
Packing group :	I	11
Labels :	(CORROSIVE
ERG Code :		153
Marine pollutant :	r	าด
•		

Special precautions for user

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

SECTION 15. REGULATORY INFORMATION

CERCLA Reportable Quantity

This material does not contain any components with a CERCLA RQ.

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 302 Extremely Hazardous Substances Threshold Planning Quantity

This material does not contain any components with a section 302 EHS TPQ.

SARA 311/312 Hazards	:	Skin corrosion or irritation Serious eye damage or eye irritation
SARA 313	:	This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

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Clean Air Act

This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCMI Intermediate or Final VOC's (40 CFR 60.489).

Clean Water Act

This product does not contain any Hazardous Substances listed under the U.S. CleanWater Act, Section 311, Table 116.4A.

This product does not contain any Hazardous Chemicals listed under the U.S. CleanWater Act, Section 311, Table 117.3.

This product does not contain any toxic pollutants listed under the U.S. Clean Water Act Section 307

This product does not contain any priority pollutants related to the U.S. Clean Water Act

US State Regulations

Massachusetts Right To Know

No components are subject to the Massachusetts Right to Know Act.

Pennsylvania Right To Know

L(+)-lactic acid	Not Assigned
H2O	Not Assigned

Maine Chemicals of High Concern

Product does not contain any listed chemicals

Vermont Chemicals of High Concern

Product does not contain any listed chemicals

Washington Chemicals of High Concern

Product does not contain any listed chemicals

The components of this product are reported in the following inventories:

TCSI	:	On the inventory, or in compliance with the inventory
TSCA	:	All substances listed as active on the TSCA inventory
AIIC	:	On the inventory, or in compliance with the inventory
DSL	:	All components of this product are on the Canadian DSL
ENCS	:	On the inventory, or in compliance with the inventory
ISHL	:	On the inventory, or in compliance with the inventory
KECI	:	On the inventory, or in compliance with the inventory
PICCS	:	On the inventory, or in compliance with the inventory
IECSC	:	On the inventory, or in compliance with the inventory
NZIoC	:	On the inventory, or in compliance with the inventory

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REACH

This substance has been registered according to Regulation (EC) No. 1907/2006 (REACH).

TSCA list

No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

SECTION 16. OTHER INFORMATION

Full text of other abbreviations

AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI -Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ -Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB -Very Persistent and Very Bioaccumulative

Items where relevant changes have been made to the previous version are highlighted in the body of this document by two vertical lines, red letters and grey shading.

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The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

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