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1 Identification

- · Product identifier
- · Trade name: TNS Probe Solution
- Article number: 400634
- **Application of the substance / the mixture** This product is for research use - Not for human or veterinary diagnostic or therapeutic use.
- · Details of the supplier of the safety data sheet

• **Manufacturer/Supplier:** Cayman Chemical Co. 1180 E. Ellsworth Rd. Ann Arbor, MI 48108 USA

 Information department: Product safety department
 Emergency telephone number: During normal opening times: +1 (734) 971-3335 US/CANADA: 800-424-9300 Outside US/CANADA: 703-741-5970

2 Hazard(s) identification

· Classification of the substance or mixture

Flammable Liquids 4 H227 Combustible liquid.

- · Label elements
- · GHS label elements
- The product is classified and labeled according to the Globally Harmonized System (GHS).
- · Hazard pictograms None
- Signal word Warning
- · Hazard statements

H227 Combustible liquid.

· Precautionary statements

P210 Keep away from flames and hot surfaces. – No smoking.

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

P370+P378 In case of fire: Use CO2, powder or water spray to extinguish.

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

P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

· Classification system:

· NFPA ratings (scale 0 - 4)



Health = 0 Fire = 2 Reactivity = 0

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99.6633%

0.3367%

· HMIS-ratings (scale 0 - 4)



· Other hazards

- · Results of PBT and vPvB assessment
- **PBT:** Not applicable.
- vPvB: Not applicable.

3 Composition/information on ingredients

- · Chemical characterization: Mixtures
- **Description:** Mixture of the substances listed below with nonhazardous additions.

· Dangerous components:

CAS: 67-68-5 Dimethyl sulfoxide RTECS: PV6210000

· Other ingredients

53313-85-2 2-p-ToluidinyInaphthylene-6-sulfonate (sodium salt)

4 First-aid measures

- · Description of first aid measures
- · After inhalation: Supply fresh air; consult doctor in case of complaints.
- After skin contact: Generally the product does not irritate the skin.
- After eye contact: Rinse opened eye for several minutes under running water.
- After swallowing: If symptoms persist consult doctor.
- · Information for doctor:
- Most important symptoms and effects, both acute and delayed No further relevant information available.
- **Indication of any immediate medical attention and special treatment needed** No further relevant information available.

5 Fire-fighting measures

- · Extinguishing media
- Suitable extinguishing agents:

CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.

- Special hazards arising from the substance or mixture No further relevant information available.
- · Advice for firefighters
- · Protective equipment: No special measures required.

6 Accidental release measures

• **Personal precautions, protective equipment and emergency procedures** Wear protective equipment. Keep unprotected persons away.

• Environmental precautions: Dilute with plenty of water.

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(Conto Do not allow to enter sewers/ surface or ground water.	d. from page 2)
 Methods and material for containment and cleaning up: Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust Dispose contaminated material as waste according to section 13. Ensure adequate ventilation. Reference to other sections See Section 7 for information on safe handling. See Section 8 for information on personal protection equipment. See Section 13 for disposal information. Protective Action Criteria for Chemicals 	t).
· PAC-1:	
67-68-5 Dimethyl sulfoxide	150 ppm
· PAC-2:	
67-68-5 Dimethyl sulfoxide	290 ppm
· PAC-3:	
67-68-5 Dimethyl sulfoxide	1,800 ppm

7 Handling and storage

- · Handling:
- Precautions for safe handling

No special precautions are necessary if used correctly. Avoid breathing dust/fume/gas/mist/vapours/spray. Avoid prolonged or repeated exposure.

Keep away from sources of ignition.

Take precautionary measures against static discharge.re.

- Information about protection against explosions and fires: Keep ignition sources away - Do not smoke.
- · Conditions for safe storage, including any incompatibilities
- · Storage: Store in accordance with information listed on the product insert.
- Requirements to be met by storerooms and receptacles: No special requirements.
- Information about storage in one common storage facility: Not required.
- Further information about storage conditions: Keep receptacle tightly sealed.
- Specific end use(s) No further relevant information available.

8 Exposure controls/personal protection

· Additional information about design of technical systems: No further data; see section 7.

- Control parameters
- · Components with limit values that require monitoring at the workplace:
- 67-68-5 Dimethyl sulfoxide
- WEEL Long-term value: 250 ppm

• Additional information: The lists that were valid during the creation were used as basis.

- Exposure controls
- Personal protective equipment:
- General protective and hygienic measures: Wash hands before breaks and at the end of work.
- Breathing equipment: Not required.

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· Protection of hands:



Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation. Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.

Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

• Material of gloves

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

• **Penetration time of glove material** The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

• Eye protection: Goggles recommended during refilling.

9 Physical and chemical properties

 Information on basic physical and General Information 	chemical properties	
 Appearance: Form: Color: Odor: Odor threshold: 	Liquid According to product specification Odorless Not determined.	
· pH-value:	Not determined.	
 Change in condition Melting point/Melting range: Boiling point/Boiling range: 	18.5 °C (65.3 °F) 189 °C (372.2 °F)	
· Flash point:	87 °C (188.6 °F)	
· Flammability (solid, gaseous):	Not applicable.	
· Auto igniting:	270 °C (518 °F)	
· Decomposition temperature:	Not determined.	
· Ignition temperature:	Product is not selfigniting.	
· Danger of explosion:	Not determined.	
 Explosion limits: Lower: Upper: 	2.6 Vol % 42 Vol %	
· Vapor pressure at 20 °C (68 °F):	0.56 hPa (0.4 mm Hg)	
 Density at 20 °C (68 °F): Relative density Vapor density 	1.1 g/cm³ (9.1795 lbs/gal) Not determined. Not determined.	
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· Evaporation rate	Not determined.	
· Solubility in / Miscibility with		
Water at 25 °C (77 °F):	1000 g/l	
· Partition coefficient (n-octanol/w	ater): Not determined.	
· Viscosity:		
Dynamic at 20 °C (68 °F):	198 mPas	
Kinematic:	Not determined.	
· Solvent content:		
Organic solvents:	99.7 %	
VOC content:	99.66 %	
	996.6 g/l / 8.32 lb/gal	
Solids content:	0.3 %	
· Other information	No further relevant information available.	

10 Stability and reactivity

- · Reactivity No further relevant information available.
- · Chemical stability
- Thermal decomposition / conditions to be avoided:
- No decomposition if used according to specifications.
- · Possibility of hazardous reactions No dangerous reactions known.
- · Conditions to avoid No further relevant information available.
- · **Incompatible materials:** No further relevant information available.
- · Hazardous decomposition products: No dangerous decomposition products known.

11 Toxicological information

- · Information on toxicological effects
- Acute toxicity:
- · LD/LC50 values that are relevant for classification:

67-68-5 Dimethyl sulfoxide

- Oral LD50 28,300 mg/kg (rat)
 - OECD Test Guideline 401
- Dermal LD50 40,000 mg/kg (rat)

Primary irritant effect:

- on the skin: No irritant effect.
- on the eye: No irritating effect.
- Sensitization: No sensitizing effects known.
- · Additional toxicological information:
- · Carcinogenic categories

· IARC (International Agency for Research on Cancer)

None of the ingredients is listed.

· NTP (National Toxicology Program)

None of the ingredients is listed.

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· OSHA-Ca (Occupational Safety & Health Administration)

None of the ingredients is listed.

12 Ecological information

- · Toxicity
- Aquatic toxicity: No further relevant information available.
- Persistence and degradability No further relevant information available.
- · Behavior in environmental systems:
- · Bioaccumulative potential No further relevant information available.
- · Mobility in soil No further relevant information available.
- Additional ecological information:
- · General notes:

Water hazard class 1 (Self-assessment): slightly hazardous for water

Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.

- Results of PBT and vPvB assessment
- **PBT:** Not applicable.
- **vPvB:** Not applicable.
- Other adverse effects No further relevant information available.

13 Disposal considerations

- · Waste treatment methods
- Recommendation:

Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

- · Uncleaned packagings:
- **Recommendation:** Disposal must be made according to official regulations.
- · Recommended cleansing agent: Water, if necessary with cleansing agents.

UN-Number		
DOT	NA1993	
IMDG, IATA	not regulated	
UN proper shipping name		
DOT	COMBUSTIBLE LIQUID, N.O.S	
IMDG, IATA	not regulated	
Transport hazard class(es)		
DOT		
сомвизтиве		
3		
Class	3 Combustible liquids	
Label	3	

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	(Contd. from page
· ADN/R Class:	not regulated
· Packing group · DOT	III
· IMDG, IATA	not regulated
· Environmental hazards:	Not applicable.
 Special precautions for user 	Not applicable.
 Transport in bulk according to Anne MARPOL73/78 and the IBC Code 	x II of Not applicable.
· Transport/Additional information:	
· DOT · Quantity limitations	On passenger aircraft/rail: 60 L On cargo aircraft only: 220 L
· IATA · Remarks:	When sold in quantities of less than or equal to 1 mL, o 1 g, with an Excepted Quantity Code of E1, E2, E4, or E5, this item meets the De Minimis Quantities exemption, per IATA 2.6.10. Therefore packaging does not have to be labeled as Dangerous Goods/Excepted Quantity.
· UN "Model Regulation":	not regulated

15 Regulatory information

• Safety, health and environmental regulations/legislation specific for the substance or mixture No further relevant information available.

· Sara

• Section 355 (extremely hazardous substances):

None of the ingredients is listed.

· Section 313 (Specific toxic chemical listings):

None of the ingredients is listed.

• TSCA (Toxic Substances Control Act):

67-68-5 Dimethyl sulfoxide

· Hazardous Air Pollutants

None of the ingredients is listed.

· Proposition 65

· Chemicals known to cause cancer:

None of the ingredients is listed.

· Chemicals known to cause reproductive toxicity for females:

None of the ingredients is listed.

· Chemicals known to cause reproductive toxicity for males:

None of the ingredients is listed.

· Chemicals known to cause developmental toxicity:

None of the ingredients is listed.

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- · Carcinogenic categories
- · EPA (Environmental Protection Agency)
- None of the ingredients is listed.
- TLV (Threshold Limit Value)
- None of the ingredients is listed.
- NIOSH-Ca (National Institute for Occupational Safety and Health)

None of the ingredients is listed.

• Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

16 Other information

All chemicals may pose unknown hazards and should be used with caution. This SDS applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this SDS. Cayman Chemical Company assumes no responsibility for incidental or consequential damages, including lost profits, arising from the use of these data. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this SDS is based on technical data judged to be reliable, Cayman Chemical Company assumes no responsibility for the completeness or accuracy of the information contained herein.

- · Department issuing SDS: Environment protection department.
- · Contact: -
- · Date of preparation / last revision 06/27/2023
- Abbreviations and acronyms:

IMDG: International Maritime Code for Dangerous Goods DOT: US Department of Transportation IATA: International Air Transport Association EINECS: European Inventory of Existing Commercial Chemical Substances ELINCS: European List of Notified Chemical Substances CAS: Chemical Abstracts Service (division of the American Chemical Society) NFPA: National Fire Protection Association (USA) HMIS: Hazardous Materials Identification System (USA) VOC: Volatile Organic Compounds (USA, EU) LC50: Lethal concentration, 50 percent LD50: Lethal dose, 50 percent PBT: Persistent, Bioaccumulative and Toxic vPvB: very Persistent and very Bioaccumulative NIOSH: National Institute for Occupational Safety OSHA: Occupational Safety & Health TLV: Threshold Limit Value PEL: Permissible Exposure Limit **REL: Recommended Exposure Limit** Flammable Liquids 4: Flammable liquids - Category 4



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1 Identification

- · Product identifier
- Trade name: TNS Buffer Solution pH 4.0
- Article number: 400635
- **Application of the substance / the mixture** This product is for research use - Not for human or veterinary diagnostic or therapeutic use.
- · Details of the supplier of the safety data sheet

• **Manufacturer/Supplier:** Cayman Chemical Co. 1180 E. Ellsworth Rd. Ann Arbor, MI 48108 USA

 Information department: Product safety department
 Emergency telephone number: During normal opening times: +1 (734) 971-3335 US/CANADA: 800-424-9300 Outside US/CANADA: 703-741-5970

2 Hazard(s) identification

• Classification of the substance o	or mixture
GHS08 Health hazard	
Specific Target Organ Toxicity - Re 2	peated Exposure H373 May cause damage to organs through prolonged or repeated exposure.
GHS07	
Eye Irritation 2A	H319 Causes serious eye irritation.
 Label elements GHS label elements The product is classified and labele 	ed according to the Globally Harmonized System (GHS). (Contd. on page 2)
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. Hazard nictograms	(Contd. from page
· Hazard pictograms	
GHS07 GHS08	
· Signal word Warnin	g
	components of labeling:
Sodium chloride	
Hazard statements	
H319 Causes serious	
• Precautionary state	nage to organs through prolonged or repeated exposure.
	o not breathe dust/fume/gas/mist/vapors/spray.
	/ash thoroughly after handling.
	/ear eye protection / face protection.
P305+P351+P338 If	in eyes: Rinse cautiously with water for several minutes. Remove contact lense
	resent and easy to do. Continue rinsing.
	et medical advice/attention if you feel unwell.
	eye irritation persists: Get medical advice/attention.
	ispose of contents/container in accordance with local/regional/national/internatio
· Classification syste	
oluconioution oyoto	
· NFPA ratings (scale	
•	e 0 - 4)
Health :	e 0 - 4) = 2
Health = Fire = 0	e 0 - 4) = 2
200 Health = Fire = 0 Reactiv	e 0 - 4) = 2 ity = 0
Health = Fire = 0	e 0 - 4) = 2 ity = 0
200 Health = Fire = 0 Reactiv	a 0 - 4) = 2 ity = 0 a 0 - 4)
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Health = 0 Reactiv HMIS-ratings (scale HEALTH 2 FIRE 0 REACTIVITY 0 Health FIRE 0 Reactiv Cother hazards Results of PBT and PBT: Not applicable.	a 0 - 4) = 2 ity = 0 a 0 - 4) = 2 0 vity = 0 vPvB assessment
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Health = 0 Reactive HMIS-ratings (scale HEALTH 2 FIRE 0 REACTIVITY 0 Cother hazards Results of PBT and PBT: Not applicable. VPvB: Not applicable	a 0 - 4) = 2 ity = 0 a 0 - 4) = 2 0 vity = 0 vPvB assessment
Health = Fire = 0 Reactive HMIS-ratings (scale HEALTH 2 FIRE 0 REACTIVITY 0 Cother hazards Results of PBT and PBT: Not applicable. vPvB: Not applicable. 3 Composition/inf	<pre>a 0 - 4) = 2 ity = 0 a 0 - 4) = 2 0 vity = 0 vPvB assessment e. </pre>
Health = Fire = 0 Reactive HMIS-ratings (scale HEALTH 2 FIRE 0 REACTIVITY 0 Cother hazards Results of PBT and PBT: Not applicable. vPvB: Not applicable. 3 Composition/inf Chemical character	<pre>a 0 - 4) = 2 ity = 0 a 0 - 4) = 2 0 vity = 0 vPvB assessment a. formation on ingredients ization: Mixtures</pre>
Health = Fire = 0 Reactive HMIS-ratings (scale HEALTH 2 FIRE 0 REACTIVITY 0 Cother hazards Results of PBT and PBT: Not applicable. vPvB: Not applicable. SCOMPOSITION/INF	<pre>e 0 - 4) = 2 ity = 0 e 0 - 4) = 2 0 vity = 0 vPvB assessment e. formation on ingredients ization: Mixtures e of the substances listed below with nonhazardous additions.</pre>
Health = Fire = 0 Reactive HIS-ratings (scale HEALTH 2 FIRE 0 REACTIVITY 0 Cother hazards Results of PBT and PBT: Not applicable. VPVB: Not applicable. Structure Chemical character Description: Mixture Dangerous component	<pre>a 0 - 4) = 2 ity = 0 a 0 - 4) = 2 0 vity = 0 vPvB assessment e. formation on ingredients ization: Mixtures e of the substances listed below with nonhazardous additions. ments:</pre>
Health = Fire = 0 Reactive HMIS-ratings (scale HEALTH 2 FIRE 0 REACTIVITY 0 Cother hazards Results of PBT and PBT: Not applicable. vPvB: Not applicable. SCOMPOSITION/INF Chemical character Description: Mixture Dangerous compor CAS: 7647-14-5	<pre>a 0 - 4) = 2 ity = 0 a 0 - 4) = 2 0 vity = 0 vPvB assessment e. formation on ingredients ization: Mixtures e of the substances listed below with nonhazardous additions. ments: Sodium chloride 8.764</pre>
Health = Fire = 0 Reactive HMIS-ratings (scale HEALTH 2 FIRE 0 REACTIVITY 0 Cother hazards Results of PBT and PBT: Not applicable. VPVB: Not applicable. SCOMPOSITION/INF Chemical character Description: Mixture	<pre>a 0 - 4) = 2 ity = 0 a 0 - 4) = 2 0 vity = 0 vPvB assessment e. formation on ingredients ization: Mixtures e of the substances listed below with nonhazardous additions. ments: Sodium chloride 8.764</pre>

(Contd. on page 3)

US -

87.4%

Safety Data Sheet acc. to OSHA HCS

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(Contd. from page 2)

· Other ingredients

CAS: 7732-18-5 Water RTECS: ZC0110000

4 First-aid measures

· Description of first aid measures

General information:

Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.

- After inhalation: Supply fresh air; consult doctor in case of complaints.
- After skin contact: Generally the product does not irritate the skin.
- · After eye contact:
- Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
- · After swallowing: If symptoms persist consult doctor.
- · Information for doctor:
- Most important symptoms and effects, both acute and delayed No further relevant information available.
- Indication of any immediate medical attention and special treatment needed No further relevant information available.

5 Fire-fighting measures

- Extinguishing media
- **Suitable extinguishing agents:** Use fire fighting measures that suit the environment. A solid water stream may be inefficient.
- Special hazards arising from the substance or mixture 67-56-1During heating or in case of fire poisonous gases are produced.
- Advice for firefighters
- · Protective equipment: Mouth respiratory protective device.

6 Accidental release measures

- Personal precautions, protective equipment and emergency procedures Mount respiratory protective device.
- Environmental precautions: Dilute with plenty of water.
- Do not allow to enter sewers/ surface or ground water. Methods and material for containment and cleaning up: Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust). Dispose contaminated material as waste according to section 13.
- Ensure adequate ventilation.
- Reference to other sections See Section 7 for information on safe handling.
- See Section 8 for information on personal protection equipment.

See Section 13 for disposal information.

Protective Action Criteria for Chemicals

· PAC-1:

None of the ingredients is listed.

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(Contd. from page 3)

· PAC-2:

None of the ingredients is listed.

· PAC-3:

None of the ingredients is listed.

7 Handling and storage

- · Handling:
- **Precautions for safe handling** Ensure good ventilation/exhaustion at the workplace. Prevent formation of aerosols.
- Information about protection against explosions and fires: Keep respiratory protective device available.
- · Conditions for safe storage, including any incompatibilities
- Storage: Store in accordance with information listed on the product insert.
- Requirements to be met by storerooms and receptacles: No special requirements.
- Information about storage in one common storage facility: Not required.
- Further information about storage conditions: Keep receptacle tightly sealed.
- Specific end use(s) No further relevant information available.

8 Exposure controls/personal protection

· Additional information about design of technical systems: No further data; see section 7.

- · Control parameters
- Components with limit values that require monitoring at the workplace: The product does not contain any relevant quantities of materials with critical values that have to be
- monitored at the workplace.
- · Additional information: The lists that were valid during the creation were used as basis.
- · Exposure controls
- Personal protective equipment:
- General protective and hygienic measures:
- Keep away from foodstuffs, beverages and feed.
- Immediately remove all soiled and contaminated clothing.
- Wash hands before breaks and at the end of work.
- Store protective clothing separately.
- Avoid contact with the eyes.

Avoid contact with the eyes and skin.

· Breathing equipment:

In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.

Protection of hands:



Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation. Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.

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(Contd. from page 4) Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

· Material of gloves

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

Penetration time of glove material The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

• Eye protection:



Tightly sealed goggles

9 Physical and chemical properties

Appearance:	
Form:	Liquid
Color:	According to product specification
Odor:	Characteristic
Odor threshold:	Not determined.
pH-value at 20 °C (68 °F):	4
Change in condition	
Melting point/Melting range:	Undetermined.
Boiling point/Boiling range:	100 °C (212 °F)
Flash point:	Not applicable.
Flammability (solid, gaseous):	Not applicable.
Decomposition temperature:	Not determined.
Ignition temperature:	Product is not selfigniting.
Danger of explosion:	Product does not present an explosion hazard.
Explosion limits:	
Lower:	Not determined.
Upper:	Not determined.
Vapor pressure at 20 °C (68 °F):	23 hPa (17.3 mm Hg)
Density:	Not determined.
Relative density	Not determined.
Vapor density	Not determined.
Evaporation rate	Not determined.
Solubility in / Miscibility with	
Water:	Fully miscible.

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	(Contd. from page 5)
Not determined	
Not determined.	
87.4 %	
0.00 %	
0.0 g/l / 0.00 lb/gal	
12.6 %	
No further relevant information available.	
	87.4 % 0.00 % 0.0 g/l / 0.00 lb/gal 12.6 %

10 Stability and reactivity

- · Reactivity No further relevant information available.
- · Chemical stability
- Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.
- Possibility of hazardous reactions No dangerous reactions known.
- Conditions to avoid No further relevant information available.
- · Incompatible materials: No further relevant information available.
- Hazardous decomposition products: No dangerous decomposition products known.

11 Toxicological information

· Information on toxicological effects

• Acute toxicity:

7647-14-5 Sodiu	um chloride		
Oral	LDLO	1,000 mg/kg (man)	
	TDLO	650 ml/kg (man)	
	LD50	4,000 mg/kg (mouse)	
		3,000 mg/kg (rat)	
	LD50	4 g/kg (mouse)	
Inhalative	LC50	320 mg/m³ (mouse)	
	TCLO	0.63 mg/m³ (hmn)	
	LCLO	29,300 mg/m³/7h (mouse)	
Irritation of skin	Irritation	500 mg/24h (rabbit) mild	
Irritation of eyes	Irritation	100 mg/24h (rabbit) moderate	
	Intraperitoneal LD50	2,602 mg/kg (mouse)	
	Subcutaneous LD50	31.6 mg/kg (rat)	
	Intravenous LD50	59.5 mg/kg (rat)	
	Data	15 mg/3D (hmn) mild	
	Subcutaneous LD50	3 g/kg (mouse)	

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		(Contd. from page 6)
77-92-9 citri	ic acid	
Oral	LD50	5,040 mg/kg (mouse)
 on the eye: Sensitizatio Additional t 	: No irritant effect. Irritating effect. on: No sensitizing effect coxicological informa t shows the following	
· Carcinogen	ic categories	
· IARC (Interi	national Agency for F	Research on Cancer)
None of the	ingredients is listed.	
· NTP (Nation	nal Toxicology Progr	ram)
None of the	ingredients is listed.	
	•	
	<u> </u>	& Health Administration)

12 Ecological information

- · Toxicity
- Aquatic toxicity: No further relevant information available.
- Persistence and degradability No further relevant information available.
- Behavior in environmental systems:
- · **Bioaccumulative potential** No further relevant information available.
- Mobility in soil No further relevant information available.
- · Additional ecological information:
- · General notes:

Water hazard class 1 (Self-assessment): slightly hazardous for water

Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.

- · Results of PBT and vPvB assessment
- · PBT: Not applicable.
- · vPvB: Not applicable.
- Other adverse effects No further relevant information available.

13 Disposal considerations

- · Waste treatment methods
- · Recommendation:

Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

- · Uncleaned packagings:
- Recommendation: Disposal must be made according to official regulations.
- · Recommended cleansing agent: Water, if necessary with cleansing agents.

(Contd. on page 8)

Printing date 06/27/2023

Revision date 06/27/2023

Trade name: TNS Buffer Solution pH 4.0

(Contd. from page 7)

4 Transport information	
· UN-Number · DOT, IMDG, IATA	not regulated
 UN proper shipping name DOT, IMDG, IATA 	not regulated
· Transport hazard class(es)	
· DOT, ADN, IMDG, IATA · Class	not regulated
 Packing group DOT, IMDG, IATA 	not regulated
· Environmental hazards:	Not applicable.
· Special precautions for user	Not applicable.
 Transport in bulk according to Annex MARPOL73/78 and the IBC Code 	t II of Not applicable.
· UN "Model Regulation":	not regulated

15 Regulatory information

• Safety, health and environmental regulations/legislation specific for the substance or mixture No further relevant information available.

· Sara

· Section 355 (extremely hazardous substances):

None of the ingredients is listed.

· Section 313 (Specific toxic chemical listings):

None of the ingredients is listed.

• TSCA (Toxic Substances Control Act):

All components have the value ACTIVE.

· Hazardous Air Pollutants

None of the ingredients is listed.

· Proposition 65

· Chemicals known to cause cancer:

None of the ingredients is listed.

· Chemicals known to cause reproductive toxicity for females:

None of the ingredients is listed.

· Chemicals known to cause reproductive toxicity for males:

None of the ingredients is listed.

· Chemicals known to cause developmental toxicity:

None of the ingredients is listed.

Carcinogenic categories

· EPA (Environmental Protection Agency)

None of the ingredients is listed.

(Contd. on page 9)

Printing date 06/27/2023

Revision date 06/27/2023

Trade name: TNS Buffer Solution pH 4.0

(Contd. from page 8)

• TLV (Threshold Limit Value)

None of the ingredients is listed.

· NIOSH-Ca (National Institute for Occupational Safety and Health)

None of the ingredients is listed.

• Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

16 Other information

All chemicals may pose unknown hazards and should be used with caution. This SDS applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this SDS. Cayman Chemical Company assumes no responsibility for incidental or consequential damages, including lost profits, arising from the use of these data. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this SDS is based on technical data judged to be reliable, Cayman Chemical Company assumes no responsibility for the completeness or accuracy of the information contained herein.

- · Department issuing SDS: Environment protection department.
- · Contact: -
- Date of preparation / last revision 06/27/2023

 Abbreviations and acronyms: IMDG: International Maritime Code for Dangerous Goods DOT: US Department of Transportation IATA: International Air Transport Association EINECS: European Inventory of Existing Commercial Chemical Substances ELINCS: European List of Notified Chemical Substances CAS: Chemical Abstracts Service (division of the American Chemical Society) NFPA: National Fire Protection Association (USA) HMIS: Hazardous Materials Identification System (USA) VOC: Volatile Organic Compounds (USA, EU) LC50: Lethal concentration, 50 percent LD50: Lethal dose, 50 percent PBT: Persistent, Bioaccumulative and Toxic vPvB: very Persistent and very Bioaccumulative NIOSH: National Institute for Occupational Safety OSHA: Occupational Safety & Health TLV: Threshold Limit Value PEL: Permissible Exposure Limit **REL: Recommended Exposure Limit** Eye Irritation 2A: Serious eye damage/eye irritation - Category 2A Specific Target Organ Toxicity - Repeated Exposure 2: Specific target organ toxicity (repeated exposure) - Category 2



Printing date 06/27/2023

Revision date 06/27/2023

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1 Identification

- · Product identifier
- Trade name: TNS Buffer Solution pH 4.5
- Article number: 400636
- **Application of the substance / the mixture** This product is for research use - Not for human or veterinary diagnostic or therapeutic use.
- · Details of the supplier of the safety data sheet

• **Manufacturer/Supplier:** Cayman Chemical Co. 1180 E. Ellsworth Rd. Ann Arbor, MI 48108 USA

 Information department: Product safety department
 Emergency telephone number: During normal opening times: +1 (734) 971-3335 US/CANADA: 800-424-9300 Outside US/CANADA: 703-741-5970

2 Hazard(s) identification

• Classification of the substance o	or mixture
GHS08 Health hazard	
Specific Target Organ Toxicity - Re 2	peated Exposure H373 May cause damage to organs through prolonged or repeated exposure.
GHS07	
Eye Irritation 2A	H319 Causes serious eye irritation.
 Label elements GHS label elements The product is classified and labele 	ed according to the Globally Harmonized System (GHS). (Contd. on page 2)
	03

Printing date 06/27/2023

Revision date 06/27/2023

(Contd. on page 3)

US

 Hazard pictograms Wash thoroughly after handling. P260 Do not breathe dust/fume/gas/mist/vapors/spray. P264 Wash thoroughly after handling. P280 Wear eye protection / face protection. P305+P351+P338 If in eyes: Rinse cautiously with water for several minut present and easy to do. Continue rinsing. P314 Get medical advice/attention if you feel unwell. P337+P313 If eye irritation persists: Get medical advice/attention. 	
 Signal word Warning Hazard-determining components of labeling: Sodium chloride Hazard statements H319 Causes serious eye irritation. H373 May cause damage to organs through prolonged or repeated exposus Precautionary statements P260 Do not breathe dust/fume/gas/mist/vapors/spray. P264 Wash thoroughly after handling. P280 Wear eye protection / face protection. P305+P351+P338 If in eyes: Rinse cautiously with water for several minut present and easy to do. Continue rinsing. P314 Get medical advice/attention if you feel unwell. 	
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P314 present and easy to do. Continue rinsing. P314 Get medical advice/attention if you feel unwell.	es. Remove contact lenses
P314 Get medical advice/attention if you feel unwell.	
P337+P313 If eye initiation persists: Get medical advice/attention.	
P501 Dispose of contents/container in accordance with local/	/regional/national/internation
regulations.	
· Classification system:	
• NFPA ratings (scale 0 - 4)	
Health = 2	
Fire = 0	
2 0 Reactivity = 0	
· HMIS-ratings (scale 0 - 4)	
$\frac{\text{HEALTH}}{2} \text{ Health} = 2$	
Reactivity = 0	
· Other hazards	
· Results of PBT and vPvB assessment	
· PBT: Not applicable.	
· vPvB: Not applicable.	
3 Composition/information on ingredients	
Chemical characterization: Mixtures	
• Description: Mixture of the substances listed below with nonhazardous ac	dditions.
Dangerous components:	0.704
CAS: 7647-14-5 Sodium chloride RTECS: VZ4725000	8.764
CAS: 77-92-9 citric acid RTECS: GE7350000	3.836

87.4%

Safety Data Sheet acc. to OSHA HCS

Printing date 06/27/2023

Revision date 06/27/2023

Trade name: TNS Buffer Solution pH 4.5

(Contd. from page 2)

· Other ingredients

CAS: 7732-18-5 Water RTECS: ZC0110000

4 First-aid measures

· Description of first aid measures

· General information:

Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.

- After inhalation: Supply fresh air; consult doctor in case of complaints.
- After skin contact: Generally the product does not irritate the skin.
- After eye contact:
- Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
- · After swallowing: If symptoms persist consult doctor.
- · Information for doctor:
- Most important symptoms and effects, both acute and delayed No further relevant information available.
- Indication of any immediate medical attention and special treatment needed No further relevant information available.

5 Fire-fighting measures

- Extinguishing media
- **Suitable extinguishing agents:** Use fire fighting measures that suit the environment. A solid water stream may be inefficient.
- Special hazards arising from the substance or mixture 67-56-1During heating or in case of fire poisonous gases are produced.
- Advice for firefighters
- · Protective equipment: Mouth respiratory protective device.

6 Accidental release measures

- Personal precautions, protective equipment and emergency procedures Mount respiratory protective device.
- Environmental precautions: Dilute with plenty of water.
- Do not allow to enter sewers/ surface or ground water. Methods and material for containment and cleaning up: Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust). Dispose contaminated material as waste according to section 13. Ensure adequate ventilation.
- Reference to other sections
 See Section 7 for information on safe handling.
 See Section 8 for information on personal protection equipment.
 See Section 13 for disposal information.
- Protective Action Criteria for Chemicals

· PAC-1:

None of the ingredients is listed.

(Contd. on page 4)

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Printing date 06/27/2023

Revision date 06/27/2023

Trade name: TNS Buffer Solution pH 4.5

(Contd. from page 3)

· PAC-2:

None of the ingredients is listed.

· PAC-3:

None of the ingredients is listed.

7 Handling and storage

- · Handling:
- **Precautions for safe handling** Ensure good ventilation/exhaustion at the workplace. Prevent formation of aerosols.
- Information about protection against explosions and fires: Keep respiratory protective device available.
- · Conditions for safe storage, including any incompatibilities
- Storage: Store in accordance with information listed on the product insert.
- Requirements to be met by storerooms and receptacles: No special requirements.
- Information about storage in one common storage facility: Not required.
- Further information about storage conditions: Keep receptacle tightly sealed.
- Specific end use(s) No further relevant information available.

8 Exposure controls/personal protection

· Additional information about design of technical systems: No further data; see section 7.

- · Control parameters
- **Components with limit values that require monitoring at the workplace:** The product does not contain any relevant quantities of materials with critical values that have to be

The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.

- · Additional information: The lists that were valid during the creation were used as basis.
- · Exposure controls
- · Personal protective equipment:
- General protective and hygienic measures:
- Keep away from foodstuffs, beverages and feed.
- Immediately remove all soiled and contaminated clothing.

Wash hands before breaks and at the end of work.

Store protective clothing separately.

Avoid contact with the eyes.

Avoid contact with the eyes and skin.

· Breathing equipment:

In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.

Protection of hands:



Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation. Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.

(Contd. on page 5)

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Trade name: TNS Buffer Solution pH 4.5

(Contd. from page 4) Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

· Material of gloves

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

• **Penetration time of glove material** The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

• Eye protection:



Tightly sealed goggles

9 Physical and chemical properties

Appearance:	
Form:	Liquid
Color:	According to product specification
Odor:	Characteristic
Odor threshold:	Not determined.
pH-value at 20 °C (68 °F):	4.5
Change in condition	
Melting point/Melting range:	Undetermined.
Boiling point/Boiling range:	100 °C (212 °F)
Flash point:	Not applicable.
Flammability (solid, gaseous):	Not applicable.
Decomposition temperature:	Not determined.
Ignition temperature:	Product is not selfigniting.
Danger of explosion:	Product does not present an explosion hazard.
Explosion limits:	
Lower:	Not determined.
Upper:	Not determined.
Vapor pressure at 20 °C (68 °F):	23 hPa (17.3 mm Hg)
Density:	Not determined.
Relative density	Not determined.
Vapor density	Not determined.
Evaporation rate	Not determined.
Solubility in / Miscibility with	
Water:	Fully miscible.

Printing date 06/27/2023

Revision date 06/27/2023

Trade name: TNS Buffer Solution pH 4.5

	(Contd. from pag	e 5)
 Viscosity: Dynamic: Kinematic: 	Not determined. Not determined.	
 Solvent content: Water: VOC content: 	87.4 % 0.00 % 0.0 g/l / 0.00 lb/gal	
Solids content:	12.6 %	
· Other information	No further relevant information available.	

10 Stability and reactivity

- · Reactivity No further relevant information available.
- · Chemical stability
- Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.
- Possibility of hazardous reactions No dangerous reactions known.
- Conditions to avoid No further relevant information available.
- · Incompatible materials: No further relevant information available.
- Hazardous decomposition products: No dangerous decomposition products known.

11 Toxicological information

· Information on toxicological effects

• Acute toxicity:

7647-14-5 Sodiu	um chloride		
Oral	LDLO	1,000 mg/kg (man)	
	TDLO	650 ml/kg (man)	
	LD50	4,000 mg/kg (mouse)	
		3,000 mg/kg (rat)	
	LD50	4 g/kg (mouse)	
Inhalative	LC50	320 mg/m³ (mouse)	
	TCLO	0.63 mg/m³ (hmn)	
	LCLO	29,300 mg/m³/7h (mouse)	
Irritation of skin	Irritation	500 mg/24h (rabbit) mild	
Irritation of eyes	Irritation	100 mg/24h (rabbit) moderate	
	Intraperitoneal LD50	2,602 mg/kg (mouse)	
	Subcutaneous LD50	31.6 mg/kg (rat)	
	Intravenous LD50	59.5 mg/kg (rat)	
	Data	15 mg/3D (hmn) mild	
	Subcutaneous LD50	3 g/kg (mouse)	

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Trade name: TNS Buffer Solution pH 4.5

		(Contd. from page 6)
77-92-9 citric a	cid	
Oral	LD50	5,040 mg/kg (mouse)
 Additional toxic 	irritant effect. ating effect. lo sensitizing effects l cological informatior	
· Carcinogenic c	ategories	
· IARC (Internation	onal Agency for Rese	earch on Cancer)
None of the ingr	edients is listed.	
· NTP (National 1	Coxicology Program)	
None of the ingr	edients is listed.	
OSHA-Ca (Occ	upational Safety & H	ealth Administration)
None of the ingr	adiants is listed	

12 Ecological information

- · Toxicity
- · Aquatic toxicity: No further relevant information available.
- Persistence and degradability No further relevant information available.
- Behavior in environmental systems:
- · Bioaccumulative potential No further relevant information available.
- Mobility in soil No further relevant information available.
- · Additional ecological information:
- · General notes:

Water hazard class 1 (Self-assessment): slightly hazardous for water

Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.

- · Results of PBT and vPvB assessment
- · PBT: Not applicable.
- · vPvB: Not applicable.
- Other adverse effects No further relevant information available.

13 Disposal considerations

- · Waste treatment methods
- · Recommendation:

Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

- · Uncleaned packagings:
- Recommendation: Disposal must be made according to official regulations.
- · Recommended cleansing agent: Water, if necessary with cleansing agents.

(Contd. on page 8)

Printing date 06/27/2023

Revision date 06/27/2023

Trade name: TNS Buffer Solution pH 4.5

(Contd. from page 7)

4 Transport information	
· UN-Number · DOT, IMDG, IATA	not regulated
 UN proper shipping name DOT, IMDG, IATA 	not regulated
· Transport hazard class(es)	
[·] DOT, ADN, IMDG, IATA [·] Class	not regulated
 Packing group DOT, IMDG, IATA 	not regulated
· Environmental hazards:	Not applicable.
· Special precautions for user	Not applicable.
 Transport in bulk according to Annex MARPOL73/78 and the IBC Code 	I of Not applicable.
· UN "Model Regulation":	not regulated

15 Regulatory information

• Safety, health and environmental regulations/legislation specific for the substance or mixture No further relevant information available.

· Sara

· Section 355 (extremely hazardous substances):

None of the ingredients is listed.

· Section 313 (Specific toxic chemical listings):

None of the ingredients is listed.

• TSCA (Toxic Substances Control Act):

All components have the value ACTIVE.

· Hazardous Air Pollutants

None of the ingredients is listed.

· Proposition 65

· Chemicals known to cause cancer:

None of the ingredients is listed.

· Chemicals known to cause reproductive toxicity for females:

None of the ingredients is listed.

· Chemicals known to cause reproductive toxicity for males:

None of the ingredients is listed.

· Chemicals known to cause developmental toxicity:

None of the ingredients is listed.

Carcinogenic categories

· EPA (Environmental Protection Agency)

None of the ingredients is listed.

(Contd. on page 9)

US

Printing date 06/27/2023

Revision date 06/27/2023

Trade name: TNS Buffer Solution pH 4.5

(Contd. from page 8)

• TLV (Threshold Limit Value)

None of the ingredients is listed.

· NIOSH-Ca (National Institute for Occupational Safety and Health)

None of the ingredients is listed.

• Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

16 Other information

All chemicals may pose unknown hazards and should be used with caution. This SDS applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this SDS. Cayman Chemical Company assumes no responsibility for incidental or consequential damages, including lost profits, arising from the use of these data. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this SDS is based on technical data judged to be reliable, Cayman Chemical Company assumes no responsibility for the completeness or accuracy of the information contained herein.

- · Department issuing SDS: Environment protection department.
- · Contact: -
- Date of preparation / last revision 06/27/2023

 Abbreviations and acronyms: IMDG: International Maritime Code for Dangerous Goods DOT: US Department of Transportation IATA: International Air Transport Association EINECS: European Inventory of Existing Commercial Chemical Substances ELINCS: European List of Notified Chemical Substances CAS: Chemical Abstracts Service (division of the American Chemical Society) NFPA: National Fire Protection Association (USA) HMIS: Hazardous Materials Identification System (USA) VOC: Volatile Organic Compounds (USA, EU) LC50: Lethal concentration, 50 percent LD50: Lethal dose, 50 percent PBT: Persistent, Bioaccumulative and Toxic vPvB: very Persistent and very Bioaccumulative NIOSH: National Institute for Occupational Safety OSHA: Occupational Safety & Health TLV: Threshold Limit Value PEL: Permissible Exposure Limit **REL: Recommended Exposure Limit** Eye Irritation 2A: Serious eye damage/eye irritation - Category 2A Specific Target Organ Toxicity - Repeated Exposure 2: Specific target organ toxicity (repeated exposure) - Category 2



Printing date 06/27/2023

Revision date 06/27/2023

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1 Identification

- · Product identifier
- Trade name: TNS Buffer Solution pH 5.0
- · Article number: 400637
- **Application of the substance / the mixture** This product is for research use - Not for human or veterinary diagnostic or therapeutic use.
- · Details of the supplier of the safety data sheet

• **Manufacturer/Supplier:** Cayman Chemical Co. 1180 E. Ellsworth Rd. Ann Arbor, MI 48108 USA

 Information department: Product safety department
 Emergency telephone number: During normal opening times: +1 (734) 971-3335 US/CANADA: 800-424-9300 Outside US/CANADA: 703-741-5970

2 Hazard(s) identification

• Classification of the substance or r	mixture
GHS08 Health hazard	
Specific Target Organ Toxicity - Repe 2	eated Exposure H373 May cause damage to organs through prolonged or repeated exposure.
GHS07	
Eye Irritation 2A	H319 Causes serious eye irritation.
 Label elements GHS label elements The product is classified and labeled and	according to the Globally Harmonized System (GHS). (Contd. on page 2)
	03-

Printing date 06/27/2023

CAS: 77-92-9 RTECS: GE7350000

citric acid

Revision date 06/27/2023

Hazard pictograms	rade name: TNS I	Suffer Solution pH 5.0	
 Signal word Warning Hazard-determining components of labeling: Sodium chloride Hazard statements Hatard statements Hazard statements Precautionary statements P260 Do not breathe dust/fume/gas/mist/vapors/spray. P264 Wear eye protection / face protection. P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses present and easy to do. Continue rinsing. P314 Get medical advice/attention if you feel unwell. P337+P313 If eye irritation persists: Get medical advice/attention. P501 Dispose of contents/container in accordance with local/regional/national/internation regulations Classification system: NFPA ratings (scale 0 - 4) Meath = 2 Fire = 0 Reactivity = 0 Health = 2 Fire = 0 Reactivity = 0 Health = 2 Fire = 0 Reactivity = 0 Cother hazards Health = 1 Health = 2 Fire = 0 Reactivity = 0 Fire = 0 Reactivity = 0 Cother hazards Reactivity = 0 Store of PBT and vPvB assessment Pire Not applicable. Scomposition/information on ingredients Chemical characterization: Mixtures Description: Mixture of the substances listed below with nonhazardous additions. Chargerous components: CAS: 7647-14-5 [Sodium chloride 8.764/ 	. Hozard piatogr		(Contd. from page
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3.836%

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87.4%

Safety Data Sheet acc. to OSHA HCS

Printing date 06/27/2023

Revision date 06/27/2023

Trade name: TNS Buffer Solution pH 5.0

(Contd. from page 2)

· Other ingredients

CAS: 7732-18-5 Water RTECS: ZC0110000

4 First-aid measures

· Description of first aid measures

General information:

Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.

- After inhalation: Supply fresh air; consult doctor in case of complaints.
- After skin contact: Generally the product does not irritate the skin.
- · After eye contact:
- Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
- · After swallowing: If symptoms persist consult doctor.
- · Information for doctor:
- Most important symptoms and effects, both acute and delayed No further relevant information available.
- Indication of any immediate medical attention and special treatment needed No further relevant information available.

5 Fire-fighting measures

- Extinguishing media
- **Suitable extinguishing agents:** Use fire fighting measures that suit the environment. A solid water stream may be inefficient.
- Special hazards arising from the substance or mixture 67-56-1During heating or in case of fire poisonous gases are produced.
- Advice for firefighters
- · Protective equipment: Mouth respiratory protective device.

6 Accidental release measures

- Personal precautions, protective equipment and emergency procedures Mount respiratory protective device.
- Environmental precautions: Dilute with plenty of water.
- Do not allow to enter sewers/ surface or ground water. **Methods and material for containment and cleaning up:** Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust). Dispose contaminated material as waste according to section 13.
- Ensure adequate ventilation.
- Reference to other sections
 See Section 7 for information on safe handling.
 See Section 8 for information on personal protection equipment.
- See Section 13 for disposal information.
- Protective Action Criteria for Chemicals

· PAC-1:

None of the ingredients is listed.

(Contd. on page 4)

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(Contd. from page 3)

· PAC-2:

None of the ingredients is listed.

· PAC-3:

None of the ingredients is listed.

7 Handling and storage

- · Handling:
- **Precautions for safe handling** Ensure good ventilation/exhaustion at the workplace. Prevent formation of aerosols.
- Information about protection against explosions and fires: Keep respiratory protective device available.
- · Conditions for safe storage, including any incompatibilities
- Storage: Store in accordance with information listed on the product insert.
- Requirements to be met by storerooms and receptacles: No special requirements.
- Information about storage in one common storage facility: Not required.
- Further information about storage conditions: Keep receptacle tightly sealed.
- Specific end use(s) No further relevant information available.

8 Exposure controls/personal protection

· Additional information about design of technical systems: No further data; see section 7.

- · Control parameters
- Components with limit values that require monitoring at the workplace: The product does not contain any relevant quantities of materials with critical values that have to be

monitored at the workplace.

- · Additional information: The lists that were valid during the creation were used as basis.
- · Exposure controls
- · Personal protective equipment:
- General protective and hygienic measures:
- Keep away from foodstuffs, beverages and feed.
- Immediately remove all soiled and contaminated clothing.

Wash hands before breaks and at the end of work.

Store protective clothing separately.

Avoid contact with the eyes.

Avoid contact with the eyes and skin.

· Breathing equipment:

In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.

Protection of hands:



Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation. Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.

(Contd. on page 5)

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(Contd. from page 4) Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

· Material of gloves

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

Penetration time of glove material The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

• Eye protection:



Tightly sealed goggles

9 Physical and chemical properties

Appearance:	
Form:	Liquid
Color:	According to product specification
Odor:	Characteristic
Odor threshold:	Not determined.
pH-value at 20 °C (68 °F):	5
Change in condition	
Melting point/Melting range:	Undetermined.
Boiling point/Boiling range:	100 °C (212 °F)
Flash point:	Not applicable.
Flammability (solid, gaseous):	Not applicable.
Decomposition temperature:	Not determined.
Ignition temperature:	Product is not selfigniting.
Danger of explosion:	Product does not present an explosion hazard.
Explosion limits:	
Lower:	Not determined.
Upper:	Not determined.
Vapor pressure at 20 °C (68 °F):	23 hPa (17.3 mm Hg)
Density:	Not determined.
Relative density	Not determined.
Vapor density	Not determined.
Evaporation rate	Not determined.
Solubility in / Miscibility with	
Water:	Fully miscible.

Printing date 06/27/2023

Revision date 06/27/2023

Trade name: TNS Buffer Solution pH 5.0

	(Contd. fro	om page 5)
 Viscosity: Dynamic: Kinematic: 	Not determined. Not determined.	
 Solvent content: Water: VOC content: 	87.4 % 0.00 % 0.0 g/l / 0.00 lb/gal	
Solids content:	12.6 %	
· Other information	No further relevant information available.	

10 Stability and reactivity

- · Reactivity No further relevant information available.
- · Chemical stability
- Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.
- Possibility of hazardous reactions No dangerous reactions known.
- Conditions to avoid No further relevant information available.
- · Incompatible materials: No further relevant information available.
- Hazardous decomposition products: No dangerous decomposition products known.

11 Toxicological information

· Information on toxicological effects

• Acute toxicity:

7647-14-5 Sodiu	um chloride		
Oral	LDLO	1,000 mg/kg (man)	
	TDLO	650 ml/kg (man)	
	LD50	4,000 mg/kg (mouse)	
		3,000 mg/kg (rat)	
	LD50	4 g/kg (mouse)	
Inhalative	LC50	320 mg/m³ (mouse)	
	TCLO	0.63 mg/m³ (hmn)	
	LCLO	29,300 mg/m³/7h (mouse)	
Irritation of skin	Irritation	500 mg/24h (rabbit) mild	
Irritation of eyes	Irritation	100 mg/24h (rabbit) moderate	
	Intraperitoneal LD50	2,602 mg/kg (mouse)	
	Subcutaneous LD50	31.6 mg/kg (rat)	
	Intravenous LD50	59.5 mg/kg (rat)	
	Data	15 mg/3D (hmn) mild	
	Subcutaneous LD50	3 g/kg (mouse)	

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Printing date 06/27/2023

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Trade name: TNS Buffer Solution pH 5.0

		(Contd. from page 6)	
77-92-9 citric acid			
Oral	LD50	5,040 mg/kg (mouse)	
 Primary irritant effect: on the skin: No irritant effect. on the eye: Irritating effect. Sensitization: No sensitizing effects known. Additional toxicological information: The product shows the following dangers according to internally approved calculation methods for preparations: Irritant 			
· Carcinogenic categories			
· IARC (International Agency for Research on Cancer)			
None of the ingredients is listed.			
· NTP (National 1	oxicology Program)		
None of the ingredients is listed.			
OSHA-Ca (Occi	upational Safety & He	ealth Administration)	
None of the ingredients is listed.			

12 Ecological information

- · Toxicity
- · Aquatic toxicity: No further relevant information available.
- Persistence and degradability No further relevant information available.
- Behavior in environmental systems:
- · Bioaccumulative potential No further relevant information available.
- Mobility in soil No further relevant information available.
- · Additional ecological information:
- · General notes:

Water hazard class 1 (Self-assessment): slightly hazardous for water

Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.

- · Results of PBT and vPvB assessment
- · PBT: Not applicable.
- · vPvB: Not applicable.
- Other adverse effects No further relevant information available.

13 Disposal considerations

- · Waste treatment methods
- · Recommendation:

Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

- · Uncleaned packagings:
- Recommendation: Disposal must be made according to official regulations.
- · Recommended cleansing agent: Water, if necessary with cleansing agents.

(Contd. on page 8)

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Revision date 06/27/2023

Trade name: TNS Buffer Solution pH 5.0

(Contd. from page 7)

4 Transport information	
· UN-Number · DOT, IMDG, IATA	not regulated
 UN proper shipping name DOT, IMDG, IATA 	not regulated
· Transport hazard class(es)	
· DOT, ADN, IMDG, IATA · Class	not regulated
 Packing group DOT, IMDG, IATA 	not regulated
· Environmental hazards:	Not applicable.
· Special precautions for user	Not applicable.
 Transport in bulk according to Annex MARPOL73/78 and the IBC Code 	Il of Not applicable.
· UN "Model Regulation":	not regulated

15 Regulatory information

• Safety, health and environmental regulations/legislation specific for the substance or mixture No further relevant information available.

· Sara

· Section 355 (extremely hazardous substances):

None of the ingredients is listed.

· Section 313 (Specific toxic chemical listings):

None of the ingredients is listed.

• TSCA (Toxic Substances Control Act):

All components have the value ACTIVE.

· Hazardous Air Pollutants

None of the ingredients is listed.

· Proposition 65

· Chemicals known to cause cancer:

None of the ingredients is listed.

· Chemicals known to cause reproductive toxicity for females:

None of the ingredients is listed.

· Chemicals known to cause reproductive toxicity for males:

None of the ingredients is listed.

· Chemicals known to cause developmental toxicity:

None of the ingredients is listed.

Carcinogenic categories

· EPA (Environmental Protection Agency)

None of the ingredients is listed.

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Revision date 06/27/2023

Trade name: TNS Buffer Solution pH 5.0

(Contd. from page 8)

• TLV (Threshold Limit Value)

None of the ingredients is listed.

· NIOSH-Ca (National Institute for Occupational Safety and Health)

None of the ingredients is listed.

• Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

16 Other information

All chemicals may pose unknown hazards and should be used with caution. This SDS applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this SDS. Cayman Chemical Company assumes no responsibility for incidental or consequential damages, including lost profits, arising from the use of these data. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this SDS is based on technical data judged to be reliable, Cayman Chemical Company assumes no responsibility for the completeness or accuracy of the information contained herein.

- · Department issuing SDS: Environment protection department.
- · Contact: -
- Date of preparation / last revision 06/27/2023

 Abbreviations and acronyms: IMDG: International Maritime Code for Dangerous Goods DOT: US Department of Transportation IATA: International Air Transport Association EINECS: European Inventory of Existing Commercial Chemical Substances ELINCS: European List of Notified Chemical Substances CAS: Chemical Abstracts Service (division of the American Chemical Society) NFPA: National Fire Protection Association (USA) HMIS: Hazardous Materials Identification System (USA) VOC: Volatile Organic Compounds (USA, EU) LC50: Lethal concentration, 50 percent LD50: Lethal dose, 50 percent PBT: Persistent, Bioaccumulative and Toxic vPvB: very Persistent and very Bioaccumulative NIOSH: National Institute for Occupational Safety OSHA: Occupational Safety & Health TLV: Threshold Limit Value PEL: Permissible Exposure Limit **REL: Recommended Exposure Limit** Eye Irritation 2A: Serious eye damage/eye irritation - Category 2A Specific Target Organ Toxicity - Repeated Exposure 2: Specific target organ toxicity (repeated exposure) - Category 2



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1 Identification

- · Product identifier
- Trade name: TNS Buffer Solution pH 5.5
- Article number: 400638
- **Application of the substance / the mixture** This product is for research use - Not for human or veterinary diagnostic or therapeutic use.
- · Details of the supplier of the safety data sheet

• **Manufacturer/Supplier:** Cayman Chemical Co. 1180 E. Ellsworth Rd. Ann Arbor, MI 48108 USA

 Information department: Product safety department
 Emergency telephone number: During normal opening times: +1 (734) 971-3335 US/CANADA: 800-424-9300 Outside US/CANADA: 703-741-5970

2 Hazard(s) identification

· Classification of the substance or mixt	ure
GHS08 Health hazard	
Specific Target Organ Toxicity - Repeated 2	Exposure H373 May cause damage to organs through prolonged or repeated exposure.
GHS07	
Eye Irritation 2A	H319 Causes serious eye irritation.
 Label elements GHS label elements The product is classified and labeled according 	ording to the Globally Harmonized System (GHS). (Contd. on page 2) us

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		(Contd. from pag
Hazard pictogra	ms	
<.		
GHS07 GHS0	3	
Signal word Wa	rning	
	ning components of labeling:	
Sodium chloride		
Hazard stateme		
	rious eye irritation.	tad avpagura
Precautionary s	damage to organs through prolonged or repea	ieu exposure.
Precautionary s P260	Do not breathe dust/fume/gas/mist/vapors/sp	irav.
P264	Wash thoroughly after handling.	nay.
P280	Wear eye protection / face protection.	
	8 If in eyes: Rinse cautiously with water for sev	reral minutes. Remove contact lense
1000110011100	present and easy to do. Continue rinsing.	
P314	Get medical advice/attention if you feel unwe	И.
P337+P313	If eye irritation persists: Get medical advice/a	
P501	Dispose of contents/container in accordance	
	regulations.	
Classification s		
NFPA ratings (s	cale 0 - 4)	
Hea	lth = 2	
	= 0	
C V Rea	activity = 0	
HMIS-ratings (s	cale 0 - 4)	
HEALTH 2 He	alth = 2	
	e = 0	
	activity = 0	
Other hazards		
	and vPvB assessment	
PBT: Not applica		
vPvB: Not applie	able.	
Composition	information on ingredients	
Chemical chara	cterization: Mixtures	
	ture of the substances listed below with nonha	zardous additions
Dangerous com		
CAS: 7647-14-5	Sodium chloride	8.764
1.4.7 / 04/-14-7		8.764

 Dangerous component 	ents:	
CAS: 7647-14-5 RTECS: VZ4725000	Sodium chloride	8.764%
CAS: 77-92-9 RTECS: GE7350000	citric acid	3.836%
	(Contd	on page 3)
		US -

87.4%

Safety Data Sheet acc. to OSHA HCS

Printing date 06/27/2023

Revision date 06/27/2023

Trade name: TNS Buffer Solution pH 5.5

(Contd. from page 2)

· Other ingredients

CAS: 7732-18-5 Water RTECS: ZC0110000

4 First-aid measures

· Description of first aid measures

· General information:

Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.

- After inhalation: Supply fresh air; consult doctor in case of complaints.
- After skin contact: Generally the product does not irritate the skin.
- · After eye contact:
- Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
- · After swallowing: If symptoms persist consult doctor.
- · Information for doctor:
- Most important symptoms and effects, both acute and delayed No further relevant information available.
- Indication of any immediate medical attention and special treatment needed No further relevant information available.

5 Fire-fighting measures

- Extinguishing media
- **Suitable extinguishing agents:** Use fire fighting measures that suit the environment. A solid water stream may be inefficient.
- Special hazards arising from the substance or mixture 67-56-1During heating or in case of fire poisonous gases are produced.
- Advice for firefighters
- · Protective equipment: Mouth respiratory protective device.

6 Accidental release measures

- Personal precautions, protective equipment and emergency procedures Mount respiratory protective device.
- Environmental precautions: Dilute with plenty of water.
- Do not allow to enter sewers/ surface or ground water. Methods and material for containment and cleaning up: Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust). Dispose contaminated material as waste according to section 13.
- Ensure adequate ventilation. • **Reference to other sections**
- See Section 7 for information on safe handling.
- See Section 8 for information on personal protection equipment.
- See Section 13 for disposal information.
- Protective Action Criteria for Chemicals

· PAC-1:

None of the ingredients is listed.

(Contd. on page 4)

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Trade name: TNS Buffer Solution pH 5.5

(Contd. from page 3)

· PAC-2:

None of the ingredients is listed.

· PAC-3:

None of the ingredients is listed.

7 Handling and storage

- · Handling:
- **Precautions for safe handling** Ensure good ventilation/exhaustion at the workplace. Prevent formation of aerosols.
- Information about protection against explosions and fires: Keep respiratory protective device available.
- · Conditions for safe storage, including any incompatibilities
- Storage: Store in accordance with information listed on the product insert.
- Requirements to be met by storerooms and receptacles: No special requirements.
- Information about storage in one common storage facility: Not required.
- Further information about storage conditions: Keep receptacle tightly sealed.
- Specific end use(s) No further relevant information available.

8 Exposure controls/personal protection

· Additional information about design of technical systems: No further data; see section 7.

- · Control parameters
- **Components with limit values that require monitoring at the workplace:** The product does not contain any relevant quantities of materials with critical values that have to be

The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.

- · Additional information: The lists that were valid during the creation were used as basis.
- · Exposure controls
- · Personal protective equipment:
- General protective and hygienic measures:
- Keep away from foodstuffs, beverages and feed.
- Immediately remove all soiled and contaminated clothing.

Wash hands before breaks and at the end of work.

Store protective clothing separately.

Avoid contact with the eyes.

Avoid contact with the eyes and skin.

· Breathing equipment:

In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.

Protection of hands:



Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation. Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.

(Contd. on page 5)

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Trade name: TNS Buffer Solution pH 5.5

(Contd. from page 4) Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

· Material of gloves

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

Penetration time of glove material The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

• Eye protection:



Tightly sealed goggles

9 Physical and chemical properties

Appearance: Form: Color: Odor: Odor threshold:	Liquid According to product specification Characteristic Not determined.
pH-value at 20 °C (68 °F):	5.5
Change in condition Melting point/Melting range: Boiling point/Boiling range:	Undetermined. 100 °C (212 °F)
Flash point:	Not applicable.
Flammability (solid, gaseous):	Not applicable.
Decomposition temperature:	Not determined.
Ignition temperature:	Product is not selfigniting.
Danger of explosion:	Product does not present an explosion hazard.
Explosion limits: Lower: Upper:	Not determined. Not determined.
Vapor pressure at 20 °C (68 °F):	23 hPa (17.3 mm Hg)
Density: Relative density Vapor density Evaporation rate	Not determined. Not determined. Not determined. Not determined.
Solubility in / Miscibility with Water:	Fully miscible.

Printing date 06/27/2023

Revision date 06/27/2023

Trade name: TNS Buffer Solution pH 5.5

	(Contd. from pag	e 5)
 Viscosity: Dynamic: Kinematic: 	Not determined. Not determined.	
 Solvent content: Water: VOC content: 	87.4 % 0.00 % 0.0 g/l / 0.00 lb/gal	
Solids content:	12.6 %	
· Other information	No further relevant information available.	

10 Stability and reactivity

- · Reactivity No further relevant information available.
- · Chemical stability
- Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.
- Possibility of hazardous reactions No dangerous reactions known.
- Conditions to avoid No further relevant information available.
- · Incompatible materials: No further relevant information available.
- Hazardous decomposition products: No dangerous decomposition products known.

11 Toxicological information

· Information on toxicological effects

• Acute toxicity:

7647-14-5 Sodiu	um chloride		
Oral	LDLO	1,000 mg/kg (man)	
	TDLO	650 ml/kg (man)	
	LD50	4,000 mg/kg (mouse)	
		3,000 mg/kg (rat)	
	LD50	4 g/kg (mouse)	
Inhalative	LC50	320 mg/m³ (mouse)	
	TCLO	0.63 mg/m³ (hmn)	
	LCLO	29,300 mg/m³/7h (mouse)	
Irritation of skin	Irritation	500 mg/24h (rabbit) mild	
Irritation of eyes	Irritation	100 mg/24h (rabbit) moderate	
	Intraperitoneal LD50	2,602 mg/kg (mouse)	
	Subcutaneous LD50	31.6 mg/kg (rat)	
	Intravenous LD50	59.5 mg/kg (rat)	
	Data	15 mg/3D (hmn) mild	
	Subcutaneous LD50	3 g/kg (mouse)	

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Printing date 06/27/2023

Revision date 06/27/2023

Trade name: TNS Buffer Solution pH 5.5

		(Contd. from page 6)
77-92-9 citric a	cid	
Oral	LD50	5,040 mg/kg (mouse)
 Additional toxic 	irritant effect. ating effect. lo sensitizing effects l cological informatior	
· Carcinogenic c	ategories	
· IARC (Internation	onal Agency for Rese	earch on Cancer)
None of the ingr	edients is listed.	
· NTP (National 1	Coxicology Program)	
None of the ingr	edients is listed.	
OSHA-Ca (Occ	upational Safety & H	ealth Administration)
None of the ingr	adiants is listed	

12 Ecological information

- · Toxicity
- · Aquatic toxicity: No further relevant information available.
- Persistence and degradability No further relevant information available.
- Behavior in environmental systems:
- · Bioaccumulative potential No further relevant information available.
- Mobility in soil No further relevant information available.
- · Additional ecological information:
- · General notes:

Water hazard class 1 (Self-assessment): slightly hazardous for water

Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.

- · Results of PBT and vPvB assessment
- · PBT: Not applicable.
- · vPvB: Not applicable.
- Other adverse effects No further relevant information available.

13 Disposal considerations

- · Waste treatment methods
- · Recommendation:

Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

- · Uncleaned packagings:
- Recommendation: Disposal must be made according to official regulations.
- · Recommended cleansing agent: Water, if necessary with cleansing agents.

(Contd. on page 8)

Printing date 06/27/2023

Revision date 06/27/2023

Trade name: TNS Buffer Solution pH 5.5

(Contd. from page 7)

4 Transport information	
· UN-Number · DOT, IMDG, IATA	not regulated
 UN proper shipping name DOT, IMDG, IATA 	not regulated
· Transport hazard class(es)	
· DOT, ADN, IMDG, IATA · Class	not regulated
 Packing group DOT, IMDG, IATA 	not regulated
· Environmental hazards:	Not applicable.
· Special precautions for user	Not applicable.
 Transport in bulk according to Annex MARPOL73/78 and the IBC Code 	Il of Not applicable.
· UN "Model Regulation":	not regulated

15 Regulatory information

• Safety, health and environmental regulations/legislation specific for the substance or mixture No further relevant information available.

· Sara

· Section 355 (extremely hazardous substances):

None of the ingredients is listed.

· Section 313 (Specific toxic chemical listings):

None of the ingredients is listed.

• TSCA (Toxic Substances Control Act):

All components have the value ACTIVE.

· Hazardous Air Pollutants

None of the ingredients is listed.

· Proposition 65

· Chemicals known to cause cancer:

None of the ingredients is listed.

· Chemicals known to cause reproductive toxicity for females:

None of the ingredients is listed.

· Chemicals known to cause reproductive toxicity for males:

None of the ingredients is listed.

· Chemicals known to cause developmental toxicity:

None of the ingredients is listed.

Carcinogenic categories

· EPA (Environmental Protection Agency)

None of the ingredients is listed.

(Contd. on page 9)

Printing date 06/27/2023

Revision date 06/27/2023

Trade name: TNS Buffer Solution pH 5.5

(Contd. from page 8)

• TLV (Threshold Limit Value)

None of the ingredients is listed.

· NIOSH-Ca (National Institute for Occupational Safety and Health)

None of the ingredients is listed.

• Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

16 Other information

All chemicals may pose unknown hazards and should be used with caution. This SDS applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this SDS. Cayman Chemical Company assumes no responsibility for incidental or consequential damages, including lost profits, arising from the use of these data. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this SDS is based on technical data judged to be reliable, Cayman Chemical Company assumes no responsibility for the completeness or accuracy of the information contained herein.

- · Department issuing SDS: Environment protection department.
- · Contact: -
- Date of preparation / last revision 06/27/2023

 Abbreviations and acronyms: IMDG: International Maritime Code for Dangerous Goods DOT: US Department of Transportation IATA: International Air Transport Association EINECS: European Inventory of Existing Commercial Chemical Substances ELINCS: European List of Notified Chemical Substances CAS: Chemical Abstracts Service (division of the American Chemical Society) NFPA: National Fire Protection Association (USA) HMIS: Hazardous Materials Identification System (USA) VOC: Volatile Organic Compounds (USA, EU) LC50: Lethal concentration, 50 percent LD50: Lethal dose, 50 percent PBT: Persistent, Bioaccumulative and Toxic vPvB: very Persistent and very Bioaccumulative NIOSH: National Institute for Occupational Safety OSHA: Occupational Safety & Health TLV: Threshold Limit Value PEL: Permissible Exposure Limit **REL: Recommended Exposure Limit** Eye Irritation 2A: Serious eye damage/eye irritation - Category 2A Specific Target Organ Toxicity - Repeated Exposure 2: Specific target organ toxicity (repeated exposure) - Category 2



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1 Identification

- · Product identifier
- Trade name: TNS Buffer Solution pH 6.0
- Article number: 400639
- **Application of the substance / the mixture** This product is for research use - Not for human or veterinary diagnostic or therapeutic use.
- · Details of the supplier of the safety data sheet

• **Manufacturer/Supplier:** Cayman Chemical Co. 1180 E. Ellsworth Rd. Ann Arbor, MI 48108 USA

 Information department: Product safety department
 Emergency telephone number: During normal opening times: +1 (734) 971-3335 US/CANADA: 800-424-9300 Outside US/CANADA: 703-741-5970

2 Hazard(s) identification

· Classification of the substance or mixture	
GHS08 Health hazard	
Specific Target Organ Toxicity - Repeated Exposure H373 May cause damage to organ 2	is through
GHS07	
Eye Irritation 2A H319 Causes serious eye irritation.	
 Label elements GHS label elements The product is classified and labeled according to the Globally Harmonized System (GHS). (Cor 	ntd. on page 2)

Printing date 06/27/2023

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(Contd. on page 3)

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rade name: TNS Buffe	r Solution pH 6.0		
· Hazard pictograms			(Contd. from page
GHS07 GHS08			
· Signal word Warnin	g		
Sodium chloride Hazard statements H319 Causes serious H373 May cause dar Precautionary state P260 D P264 W P280 W P305+P351+P338 If pr P314 G P337+P313 If P501 D	nage to organs through prolong ments o not breathe dust/fume/gas/m ash thoroughly after handling. ear eye protection / face prote- in eyes: Rinse cautiously with v esent and easy to do. Continue et medical advice/attention if yo eye irritation persists: Get med spose of contents/container in gulations. m: 0 - 4)	ist/vapors/spray. ction. water for several minutes. Rem e rinsing. bu feel unwell.	
2 0 Fire = 0 Reactiv	ty = 0		
· HMIS-ratings (scale			
HEALTH2HealthFIRE0Fire =REACTIVITY0Reactivity	0		
 Other hazards Results of PBT and PBT: Not applicable. vPvB: Not applicable 			
	ormation on ingredients		
Chemical character Description: Mixture	ization: Mixtures of the substances listed below	with nonhazardous additions.	
Dangerous compor			
CAS: 7647-14-5 RTECS: VZ4725000	Sodium chloride		8.764%
CAS: 77-92-9 RTECS: GE7350000	citric acid		3.836%
	•		(Contd. on page (

87.4%

Safety Data Sheet acc. to OSHA HCS

Printing date 06/27/2023

Revision date 06/27/2023

Trade name: TNS Buffer Solution pH 6.0

(Contd. from page 2)

· Other ingredients

CAS: 7732-18-5 Water RTECS: ZC0110000

4 First-aid measures

· Description of first aid measures

General information:

Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.

- After inhalation: Supply fresh air; consult doctor in case of complaints.
- After skin contact: Generally the product does not irritate the skin.
- · After eye contact:
- Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
- · After swallowing: If symptoms persist consult doctor.
- · Information for doctor:
- Most important symptoms and effects, both acute and delayed No further relevant information available.
- Indication of any immediate medical attention and special treatment needed No further relevant information available.

5 Fire-fighting measures

- Extinguishing media
- **Suitable extinguishing agents:** Use fire fighting measures that suit the environment. A solid water stream may be inefficient.
- Special hazards arising from the substance or mixture 67-56-1During heating or in case of fire poisonous gases are produced.
- · Advice for firefighters
- · Protective equipment: Mouth respiratory protective device.

6 Accidental release measures

- Personal precautions, protective equipment and emergency procedures Mount respiratory protective device.
- Environmental precautions: Dilute with plenty of water. Do not allow to enter sewers/ surface or ground water.
- Methods and material for containment and cleaning up: Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust). Dispose contaminated material as waste according to section 13. Ensure adequate ventilation.
- Reference to other sections
 See Section 7 for information on safe handling.
 See Section 8 for information on personal protection equipment.
 See Section 13 for disposal information.
- Protective Action Criteria for Chemicals

· PAC-1:

None of the ingredients is listed.

(Contd. on page 4)

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Printing date 06/27/2023

Revision date 06/27/2023

Trade name: TNS Buffer Solution pH 6.0

(Contd. from page 3)

· PAC-2:

None of the ingredients is listed.

· PAC-3:

None of the ingredients is listed.

7 Handling and storage

- · Handling:
- **Precautions for safe handling** Ensure good ventilation/exhaustion at the workplace. Prevent formation of aerosols.
- Information about protection against explosions and fires: Keep respiratory protective device available.
- · Conditions for safe storage, including any incompatibilities
- Storage: Store in accordance with information listed on the product insert.
- Requirements to be met by storerooms and receptacles: No special requirements.
- Information about storage in one common storage facility: Not required.
- Further information about storage conditions: Keep receptacle tightly sealed.
- Specific end use(s) No further relevant information available.

8 Exposure controls/personal protection

· Additional information about design of technical systems: No further data; see section 7.

- · Control parameters
- **Components with limit values that require monitoring at the workplace:** The product does not contain any relevant quantities of materials with critical values that have to be

The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.

- · Additional information: The lists that were valid during the creation were used as basis.
- · Exposure controls
- Personal protective equipment:
- General protective and hygienic measures:
- Keep away from foodstuffs, beverages and feed.
- Immediately remove all soiled and contaminated clothing.

Wash hands before breaks and at the end of work.

Store protective clothing separately.

Avoid contact with the eyes.

Avoid contact with the eyes and skin.

· Breathing equipment:

In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.

Protection of hands:



Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation. Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.

(Contd. on page 5)

Printing date 06/27/2023

Revision date 06/27/2023

Trade name: TNS Buffer Solution pH 6.0

(Contd. from page 4) Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

· Material of gloves

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

• **Penetration time of glove material** The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

• Eye protection:



Tightly sealed goggles

9 Physical and chemical properties

Appearance:	
Form:	Liquid
Color:	According to product specification
Odor:	Characteristic
Odor threshold:	Not determined.
pH-value at 20 °C (68 °F):	6
Change in condition	
Melting point/Melting range:	Undetermined.
Boiling point/Boiling range:	100 °C (212 °F)
Flash point:	Not applicable.
Flammability (solid, gaseous):	Not applicable.
Decomposition temperature:	Not determined.
Ignition temperature:	Product is not selfigniting.
Danger of explosion:	Product does not present an explosion hazard.
Explosion limits:	
Lower:	Not determined.
Upper:	Not determined.
Vapor pressure at 20 °C (68 °F):	23 hPa (17.3 mm Hg)
Density:	Not determined.
Relative density	Not determined.
Vapor density	Not determined.
Evaporation rate	Not determined.
Solubility in / Miscibility with	
Water:	Fully miscible.

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Printing date 06/27/2023

Revision date 06/27/2023

Trade name: TNS Buffer Solution pH 6.0

	(Contd. from page 5)
Not determined	
Not determined.	
87.4 %	
0.00 %	
0.0 g/l / 0.00 lb/gal	
12.6 %	
No further relevant information available.	
	87.4 % 0.00 % 0.0 g/l / 0.00 lb/gal 12.6 %

10 Stability and reactivity

- · Reactivity No further relevant information available.
- · Chemical stability
- Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.
- Possibility of hazardous reactions No dangerous reactions known.
- Conditions to avoid No further relevant information available.
- · Incompatible materials: No further relevant information available.
- Hazardous decomposition products: No dangerous decomposition products known.

11 Toxicological information

· Information on toxicological effects

• Acute toxicity:

7647-14-5 Sodiu	um chloride		
Oral	LDLO	1,000 mg/kg (man)	
	TDLO	650 ml/kg (man)	
	LD50	4,000 mg/kg (mouse)	
		3,000 mg/kg (rat)	
	LD50	4 g/kg (mouse)	
Inhalative	LC50	320 mg/m³ (mouse)	
	TCLO	0.63 mg/m³ (hmn)	
	LCLO	29,300 mg/m³/7h (mouse)	
Irritation of skin	Irritation	500 mg/24h (rabbit) mild	
Irritation of eyes	Irritation	100 mg/24h (rabbit) moderate	
	Intraperitoneal LD50	2,602 mg/kg (mouse)	
	Subcutaneous LD50	31.6 mg/kg (rat)	
	Intravenous LD50	59.5 mg/kg (rat)	
	Data	15 mg/3D (hmn) mild	
	Subcutaneous LD50	3 g/kg (mouse)	

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Trade name: TNS Buffer Solution pH 6.0

		(Contd. from page 6)
77-92-9 citri	ic acid	
Oral	LD50	5,040 mg/kg (mouse)
 on the eye: Sensitizatio Additional t 	: No irritant effect. Irritating effect. on: No sensitizing effect coxicological informa t shows the following	
· Carcinogen	ic categories	
· IARC (Interi	national Agency for F	Research on Cancer)
None of the	ingredients is listed.	
· NTP (Nation	nal Toxicology Progr	ram)
None of the	ingredients is listed.	
	•	
	<u> </u>	& Health Administration)

12 Ecological information

- · Toxicity
- Aquatic toxicity: No further relevant information available.
- Persistence and degradability No further relevant information available.
- Behavior in environmental systems:
- · **Bioaccumulative potential** No further relevant information available.
- Mobility in soil No further relevant information available.
- · Additional ecological information:
- · General notes:

Water hazard class 1 (Self-assessment): slightly hazardous for water

Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.

- · Results of PBT and vPvB assessment
- · PBT: Not applicable.
- · vPvB: Not applicable.
- Other adverse effects No further relevant information available.

13 Disposal considerations

- · Waste treatment methods
- · Recommendation:

Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

- · Uncleaned packagings:
- Recommendation: Disposal must be made according to official regulations.
- Recommended cleansing agent: Water, if necessary with cleansing agents.

(Contd. on page 8)

Printing date 06/27/2023

Revision date 06/27/2023

Trade name: TNS Buffer Solution pH 6.0

(Contd. from page 7)

4 Transport information	
· UN-Number · DOT, IMDG, IATA	not regulated
 UN proper shipping name DOT, IMDG, IATA 	not regulated
· Transport hazard class(es)	
· DOT, ADN, IMDG, IATA · Class	not regulated
 Packing group DOT, IMDG, IATA 	not regulated
· Environmental hazards:	Not applicable.
· Special precautions for user	Not applicable.
 Transport in bulk according to Annex MARPOL73/78 and the IBC Code 	Il of Not applicable.
· UN "Model Regulation":	not regulated

15 Regulatory information

• Safety, health and environmental regulations/legislation specific for the substance or mixture No further relevant information available.

· Sara

· Section 355 (extremely hazardous substances):

None of the ingredients is listed.

· Section 313 (Specific toxic chemical listings):

None of the ingredients is listed.

• TSCA (Toxic Substances Control Act):

All components have the value ACTIVE.

· Hazardous Air Pollutants

None of the ingredients is listed.

· Proposition 65

· Chemicals known to cause cancer:

None of the ingredients is listed.

· Chemicals known to cause reproductive toxicity for females:

None of the ingredients is listed.

· Chemicals known to cause reproductive toxicity for males:

None of the ingredients is listed.

· Chemicals known to cause developmental toxicity:

None of the ingredients is listed.

Carcinogenic categories

· EPA (Environmental Protection Agency)

None of the ingredients is listed.

(Contd. on page 9)

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Revision date 06/27/2023

Trade name: TNS Buffer Solution pH 6.0

(Contd. from page 8)

• TLV (Threshold Limit Value)

None of the ingredients is listed.

· NIOSH-Ca (National Institute for Occupational Safety and Health)

None of the ingredients is listed.

• Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

16 Other information

All chemicals may pose unknown hazards and should be used with caution. This SDS applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this SDS. Cayman Chemical Company assumes no responsibility for incidental or consequential damages, including lost profits, arising from the use of these data. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this SDS is based on technical data judged to be reliable, Cayman Chemical Company assumes no responsibility for the completeness or accuracy of the information contained herein.

- · Department issuing SDS: Environment protection department.
- · Contact: -
- Date of preparation / last revision 06/27/2023

 Abbreviations and acronyms: IMDG: International Maritime Code for Dangerous Goods DOT: US Department of Transportation IATA: International Air Transport Association EINECS: European Inventory of Existing Commercial Chemical Substances ELINCS: European List of Notified Chemical Substances CAS: Chemical Abstracts Service (division of the American Chemical Society) NFPA: National Fire Protection Association (USA) HMIS: Hazardous Materials Identification System (USA) VOC: Volatile Organic Compounds (USA, EU) LC50: Lethal concentration, 50 percent LD50: Lethal dose, 50 percent PBT: Persistent, Bioaccumulative and Toxic vPvB: very Persistent and very Bioaccumulative NIOSH: National Institute for Occupational Safety OSHA: Occupational Safety & Health TLV: Threshold Limit Value PEL: Permissible Exposure Limit **REL: Recommended Exposure Limit** Eye Irritation 2A: Serious eye damage/eye irritation - Category 2A Specific Target Organ Toxicity - Repeated Exposure 2: Specific target organ toxicity (repeated exposure) - Category 2



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1 Identification

- · Product identifier
- Trade name: TNS Buffer Solution pH 6.4
- Article number: 400640
- **Application of the substance / the mixture** This product is for research use - Not for human or veterinary diagnostic or therapeutic use.
- · Details of the supplier of the safety data sheet

• **Manufacturer/Supplier:** Cayman Chemical Co. 1180 E. Ellsworth Rd. Ann Arbor, MI 48108 USA

 Information department: Product safety department
 Emergency telephone number: During normal opening times: +1 (734) 971-3335 US/CANADA: 800-424-9300 Outside US/CANADA: 703-741-5970

2 Hazard(s) identification

• Classification of the substance o	or mixture
GHS08 Health hazard	
Specific Target Organ Toxicity - Re 2	peated Exposure H373 May cause damage to organs through prolonged or repeated exposure.
GHS07	
Eye Irritation 2A	H319 Causes serious eye irritation.
 Label elements GHS label elements The product is classified and labele 	ed according to the Globally Harmonized System (GHS). (Contd. on page 2)
	03

US

Safety Data Sheet acc. to OSHA HCS

Printing date 06/27/2023

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	(Contd. from
· Hazard pictogra	
GHS07 GHS0	18
· Signal word Wa	arning
	ining components of labeling:
Sodium chloride	
Hazard stateme	
	erious eye irritation.
• Precautionary s	e damage to organs through prolonged or repeated exposure.
P260	Do not breathe dust/fume/gas/mist/vapors/spray.
P264	Wash thoroughly after handling.
P280	Wear eye protection / face protection.
	38 If in eyes: Rinse cautiously with water for several minutes. Remove contact ler
	present and easy to do. Continue rinsing.
P314	Get medical advice/attention if you feel unwell.
P337+P313	If eye irritation persists: Get medical advice/attention.
P501	Dispose of contents/container in accordance with local/regional/national/international
Classification	regulations.
 Classification s NFPA ratings (s 	
He	alth = 2
	e = 0
C C Rea	activity = 0
HMIS-ratings (s	scale 0 - 4)
	ealth = 2 re = 0
	eactivity = 0
	Subarry 0
· Other hazards	
	and vPvB assessment
• PBT: Not applica	
• vPvB: Not applie	cable.
Composition	n/information on ingredients
-composition	
<u> </u>	acterization: Mixtures

 Dangerous componente 	ents:	
CAS: 7647-14-5 RTECS: VZ4725000	Sodium chloride	8.764%
CAS: 77-92-9 RTECS: GE7350000	citric acid	3.836%
	(Contd.	on page 3)

87.4%

Safety Data Sheet acc. to OSHA HCS

Printing date 06/27/2023

Revision date 06/27/2023

Trade name: TNS Buffer Solution pH 6.4

(Contd. from page 2)

· Other ingredients

CAS: 7732-18-5 Water RTECS: ZC0110000

4 First-aid measures

· Description of first aid measures

· General information:

Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.

- After inhalation: Supply fresh air; consult doctor in case of complaints.
- After skin contact: Generally the product does not irritate the skin.
- · After eye contact:
- Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
- · After swallowing: If symptoms persist consult doctor.
- · Information for doctor:
- Most important symptoms and effects, both acute and delayed No further relevant information available.
- Indication of any immediate medical attention and special treatment needed No further relevant information available.

5 Fire-fighting measures

- Extinguishing media
- **Suitable extinguishing agents:** Use fire fighting measures that suit the environment. A solid water stream may be inefficient.
- Special hazards arising from the substance or mixture 67-56-1During heating or in case of fire poisonous gases are produced.
- · Advice for firefighters
- · Protective equipment: Mouth respiratory protective device.

6 Accidental release measures

- Personal precautions, protective equipment and emergency procedures Mount respiratory protective device.
- Environmental precautions: Dilute with plenty of water. Do not allow to enter sewers/ surface or ground water.
- Methods and material for containment and cleaning up: Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust). Dispose contaminated material as waste according to section 13. Ensure adequate ventilation.
- Reference to other sections
 See Section 7 for information on safe handling.
 See Section 8 for information on personal protection equipment.
 See Section 13 for disposal information.
- Protective Action Criteria for Chemicals

· PAC-1:

None of the ingredients is listed.

(Contd. on page 4)

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Trade name: TNS Buffer Solution pH 6.4

(Contd. from page 3)

· PAC-2:

- None of the ingredients is listed.
- · PAC-3:
- None of the ingredients is listed.

7 Handling and storage

- · Handling:
- **Precautions for safe handling** Ensure good ventilation/exhaustion at the workplace. Prevent formation of aerosols.
- Information about protection against explosions and fires: Keep respiratory protective device available.
- · Conditions for safe storage, including any incompatibilities
- Storage: Store in accordance with information listed on the product insert.
- Requirements to be met by storerooms and receptacles: No special requirements.
- Information about storage in one common storage facility: Not required.
- Further information about storage conditions: Keep receptacle tightly sealed.
- Specific end use(s) No further relevant information available.

8 Exposure controls/personal protection

· Additional information about design of technical systems: No further data; see section 7.

- · Control parameters
- Components with limit values that require monitoring at the workplace:
 The product does not contain any relevant quantities of materials with critical values.

The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.

- · Additional information: The lists that were valid during the creation were used as basis.
- · Exposure controls
- · Personal protective equipment:
- General protective and hygienic measures:
- Keep away from foodstuffs, beverages and feed.
- Immediately remove all soiled and contaminated clothing.
- Wash hands before breaks and at the end of work.
- Store protective clothing separately.
- Avoid contact with the eyes.

Avoid contact with the eyes and skin.

· Breathing equipment:

In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.

Protection of hands:



Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation. Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.

(Contd. on page 5)

Printing date 06/27/2023

Revision date 06/27/2023

Trade name: TNS Buffer Solution pH 6.4

(Contd. from page 4) Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

· Material of gloves

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

• **Penetration time of glove material** The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

• Eye protection:



Tightly sealed goggles

9 Physical and chemical properties

Appearance:	
Form:	Liquid
Color:	According to product specification
Odor:	Characteristic
Odor threshold:	Not determined.
pH-value at 20 °C (68 °F):	6.4
Change in condition	
Melting point/Melting range:	Undetermined.
Boiling point/Boiling range:	100 °C (212 °F)
Flash point:	Not applicable.
Flammability (solid, gaseous):	Not applicable.
Decomposition temperature:	Not determined.
Ignition temperature:	Product is not selfigniting.
Danger of explosion:	Product does not present an explosion hazard.
Explosion limits:	
Lower:	Not determined.
Upper:	Not determined.
Vapor pressure at 20 °C (68 °F):	23 hPa (17.3 mm Hg)
Density:	Not determined.
Relative density	Not determined.
Vapor density	Not determined.
Evaporation rate	Not determined.
Solubility in / Miscibility with	
Water:	Fully miscible.

Printing date 06/27/2023

Revision date 06/27/2023

Trade name: TNS Buffer Solution pH 6.4

	(Contd. from page 5)
Not determined	
Not determined.	
87.4 %	
0.00 %	
0.0 g/l / 0.00 lb/gal	
12.6 %	
No further relevant information available.	
	87.4 % 0.00 % 0.0 g/l / 0.00 lb/gal 12.6 %

10 Stability and reactivity

- · Reactivity No further relevant information available.
- · Chemical stability
- Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.
- Possibility of hazardous reactions No dangerous reactions known.
- Conditions to avoid No further relevant information available.
- · Incompatible materials: No further relevant information available.
- Hazardous decomposition products: No dangerous decomposition products known.

11 Toxicological information

· Information on toxicological effects

• Acute toxicity:

7647-14-5 Sodiu	um chloride		
Oral	LDLO	1,000 mg/kg (man)	
	TDLO	650 ml/kg (man)	
	LD50	4,000 mg/kg (mouse)	
		3,000 mg/kg (rat)	
	LD50	4 g/kg (mouse)	
Inhalative	LC50	320 mg/m³ (mouse)	
	TCLO	0.63 mg/m³ (hmn)	
	LCLO	29,300 mg/m³/7h (mouse)	
Irritation of skin	Irritation	500 mg/24h (rabbit) mild	
Irritation of eyes	Irritation	100 mg/24h (rabbit) moderate	
	Intraperitoneal LD50	2,602 mg/kg (mouse)	
	Subcutaneous LD50	31.6 mg/kg (rat)	
	Intravenous LD50	59.5 mg/kg (rat)	
	Data	15 mg/3D (hmn) mild	
	Subcutaneous LD50	3 g/kg (mouse)	

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Printing date 06/27/2023

Revision date 06/27/2023

Trade name: TNS Buffer Solution pH 6.4

		(Cantal from more C)
77-92-9 citric ac	, id	(Contd. from page 6)
Oral	LD50	5,040 mg/kg (mouse)
· Primary irritant	effect:	<u>.</u>
• on the skin: No	irritant effect.	
• on the eye: Irrita	ating effect.	
· Sensitization: N	lo sensitizing effects k	(nown.
 Additional toxic 	ological information	1:
The product sho	ows the following dar	ngers according to internally approved calculation methods for
preparations:	-	
Irritant		
· Carcinogenic ca	ategories	
· IARC (Internatio	onal Agency for Rese	earch on Cancer)
None of the ingre	edients is listed.	
· NTP (National T	oxicology Program)	
None of the ingre	edients is listed.	
· OSHA-Ca (Occu	pational Safety & He	ealth Administration)
None of the ingre	edients is listed.	

12 Ecological information

- · Toxicity
- · Aquatic toxicity: No further relevant information available.
- Persistence and degradability No further relevant information available.
- Behavior in environmental systems:
- · Bioaccumulative potential No further relevant information available.
- Mobility in soil No further relevant information available.
- · Additional ecological information:
- · General notes:

Water hazard class 1 (Self-assessment): slightly hazardous for water

Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.

- · Results of PBT and vPvB assessment
- · PBT: Not applicable.
- · vPvB: Not applicable.
- Other adverse effects No further relevant information available.

13 Disposal considerations

- · Waste treatment methods
- · Recommendation:

Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

- · Uncleaned packagings:
- Recommendation: Disposal must be made according to official regulations.
- · Recommended cleansing agent: Water, if necessary with cleansing agents.

(Contd. on page 8)

Printing date 06/27/2023

Revision date 06/27/2023

Trade name: TNS Buffer Solution pH 6.4

(Contd. from page 7)

4 Transport information	
· UN-Number · DOT, IMDG, IATA	not regulated
 UN proper shipping name DOT, IMDG, IATA 	not regulated
· Transport hazard class(es)	
· DOT, ADN, IMDG, IATA · Class	not regulated
 Packing group DOT, IMDG, IATA 	not regulated
· Environmental hazards:	Not applicable.
· Special precautions for user	Not applicable.
 Transport in bulk according to Annex MARPOL73/78 and the IBC Code 	t II of Not applicable.
· UN "Model Regulation":	not regulated

15 Regulatory information

• Safety, health and environmental regulations/legislation specific for the substance or mixture No further relevant information available.

· Sara

· Section 355 (extremely hazardous substances):

None of the ingredients is listed.

· Section 313 (Specific toxic chemical listings):

None of the ingredients is listed.

• TSCA (Toxic Substances Control Act):

All components have the value ACTIVE.

· Hazardous Air Pollutants

None of the ingredients is listed.

· Proposition 65

· Chemicals known to cause cancer:

None of the ingredients is listed.

· Chemicals known to cause reproductive toxicity for females:

None of the ingredients is listed.

· Chemicals known to cause reproductive toxicity for males:

None of the ingredients is listed.

· Chemicals known to cause developmental toxicity:

None of the ingredients is listed.

Carcinogenic categories

· EPA (Environmental Protection Agency)

None of the ingredients is listed.

(Contd. on page 9)

Printing date 06/27/2023

Revision date 06/27/2023

Trade name: TNS Buffer Solution pH 6.4

(Contd. from page 8)

• TLV (Threshold Limit Value)

None of the ingredients is listed.

· NIOSH-Ca (National Institute for Occupational Safety and Health)

None of the ingredients is listed.

• Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

16 Other information

All chemicals may pose unknown hazards and should be used with caution. This SDS applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this SDS. Cayman Chemical Company assumes no responsibility for incidental or consequential damages, including lost profits, arising from the use of these data. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this SDS is based on technical data judged to be reliable, Cayman Chemical Company assumes no responsibility for the completeness or accuracy of the information contained herein.

- · Department issuing SDS: Environment protection department.
- · Contact: -
- Date of preparation / last revision 06/27/2023

 Abbreviations and acronyms: IMDG: International Maritime Code for Dangerous Goods DOT: US Department of Transportation IATA: International Air Transport Association EINECS: European Inventory of Existing Commercial Chemical Substances ELINCS: European List of Notified Chemical Substances CAS: Chemical Abstracts Service (division of the American Chemical Society) NFPA: National Fire Protection Association (USA) HMIS: Hazardous Materials Identification System (USA) VOC: Volatile Organic Compounds (USA, EU) LC50: Lethal concentration, 50 percent LD50: Lethal dose, 50 percent PBT: Persistent, Bioaccumulative and Toxic vPvB: very Persistent and very Bioaccumulative NIOSH: National Institute for Occupational Safety OSHA: Occupational Safety & Health TLV: Threshold Limit Value PEL: Permissible Exposure Limit **REL: Recommended Exposure Limit** Eye Irritation 2A: Serious eye damage/eye irritation - Category 2A Specific Target Organ Toxicity - Repeated Exposure 2: Specific target organ toxicity (repeated exposure) - Category 2



Printing date 06/27/2023

Revision date 06/27/2023

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1 Identification

- · Product identifier
- Trade name: TNS Buffer Solution pH 6.8
- · Article number: 400641
- **Application of the substance / the mixture** This product is for research use - Not for human or veterinary diagnostic or therapeutic use.
- · Details of the supplier of the safety data sheet

• **Manufacturer/Supplier:** Cayman Chemical Co. 1180 E. Ellsworth Rd. Ann Arbor, MI 48108 USA

 Information department: Product safety department
 Emergency telephone number: During normal opening times: +1 (734) 971-3335 US/CANADA: 800-424-9300 Outside US/CANADA: 703-741-5970

2 Hazard(s) identification

• Classification of the substance or r	mixture
GHS08 Health hazard	
Specific Target Organ Toxicity - Repe 2	eated Exposure H373 May cause damage to organs through prolonged or repeated exposure.
GHS07	
Eye Irritation 2A	H319 Causes serious eye irritation.
 Label elements GHS label elements The product is classified and labeled a 	according to the Globally Harmonized System (GHS). (Contd. on page 2)
	03-

3.836%

US

(Contd. on page 3)

Safety Data Sheet acc. to OSHA HCS

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RTECS: VZ4725000 CAS: 77-92-9 RTECS: GE7350000

citric acid

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		(Contd. from page
· Hazard pictogra	ims	
<		
GHS07 GHS0	8	
· Signal word Wa	rning	
	ning components of labeling:	
Sodium chloride		
· Hazard stateme		
	rious eye irritation. damage to organs through prolonged or repe	ated exposure
· Precautionary		aleu exposule.
P260	Do not breathe dust/fume/gas/mist/vapors/s	prav.
P264	Wash thoroughly after handling.	
P280	Wear eye protection / face protection.	
P305+P351+P33	8 If in eyes: Rinse cautiously with water for se	veral minutes. Remove contact lenses
	present and easy to do. Continue rinsing.	
P314	Get medical advice/attention if you feel unw	
P337+P313 P501	If eye irritation persists: Get medical advice/	
F301	Dispose of contents/container in accordance regulations.	e with local/regional/national/internation
· Classification s		
• NFPA ratings (s		
Here Here	alth = 2	
	e = 0	
	activity = 0	
· HMIS-ratings (s	cale 0 - 4)	
HEALTH 2 He		
	ealth = 2 e = 0	
	e = 0 eactivity = 0	
• Other hazards		
	and vPvB assessment	
 • PBT: Not applica • vPvB: Not applica 		
3 Composition	/information on ingredients	
Chemical chara	cterization: Mixtures	

87.4%

Safety Data Sheet acc. to OSHA HCS

Printing date 06/27/2023

Revision date 06/27/2023

Trade name: TNS Buffer Solution pH 6.8

(Contd. from page 2)

· Other ingredients

CAS: 7732-18-5 Water RTECS: ZC0110000

4 First-aid measures

· Description of first aid measures

· General information:

Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.

- After inhalation: Supply fresh air; consult doctor in case of complaints.
- After skin contact: Generally the product does not irritate the skin.
- · After eye contact:
- Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
- · After swallowing: If symptoms persist consult doctor.
- · Information for doctor:
- Most important symptoms and effects, both acute and delayed No further relevant information available.
- **Indication of any immediate medical attention and special treatment needed** No further relevant information available.

5 Fire-fighting measures

- Extinguishing media
- **Suitable extinguishing agents:** Use fire fighting measures that suit the environment. A solid water stream may be inefficient.
- Special hazards arising from the substance or mixture 67-56-1During heating or in case of fire poisonous gases are produced.
- Advice for firefighters
- · Protective equipment: Mouth respiratory protective device.

6 Accidental release measures

- Personal precautions, protective equipment and emergency procedures Mount respiratory protective device.
- Environmental precautions: Dilute with plenty of water.
- Do not allow to enter sewers/ surface or ground water. Methods and material for containment and cleaning up: Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust). Dispose contaminated material as waste according to section 13.
- Ensure adequate ventilation. • **Reference to other sections**
- See Section 7 for information on safe handling.
- See Section 8 for information on personal protection equipment.

See Section 13 for disposal information.

Protective Action Criteria for Chemicals

· PAC-1:

None of the ingredients is listed.

(Contd. on page 4)

US

Printing date 06/27/2023

Revision date 06/27/2023

Trade name: TNS Buffer Solution pH 6.8

(Contd. from page 3)

· PAC-2:

None of the ingredients is listed.

· PAC-3:

None of the ingredients is listed.

7 Handling and storage

- · Handling:
- Precautions for safe handling Ensure good ventilation/exhaustion at the workplace. Prevent formation of aerosols.
- Information about protection against explosions and fires: Keep respiratory protective device available.
- · Conditions for safe storage, including any incompatibilities
- Storage: Store in accordance with information listed on the product insert.
- Requirements to be met by storerooms and receptacles: No special requirements.
- · Information about storage in one common storage facility: Not required.
- Further information about storage conditions: Keep receptacle tightly sealed.
- · Specific end use(s) No further relevant information available.

8 Exposure controls/personal protection

• Additional information about design of technical systems: No further data; see section 7.

- · Control parameters
- · Components with limit values that require monitoring at the workplace: The product does not contain any relevant quantities of materials with critical values that have to be

monitored at the workplace.

- Additional information: The lists that were valid during the creation were used as basis.
- Exposure controls
- · Personal protective equipment:
- · General protective and hygienic measures:
- Keep away from foodstuffs, beverages and feed.
- Immediately remove all soiled and contaminated clothing.

Wash hands before breaks and at the end of work.

Store protective clothing separately.

Avoid contact with the eyes. Avoid contact with the eyes and skin.

- · Breathing equipment:

In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.

Protection of hands:



Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation. Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.

(Contd. on page 5)

US

Printing date 06/27/2023

Revision date 06/27/2023

Trade name: TNS Buffer Solution pH 6.8

(Contd. from page 4) Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

· Material of gloves

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

• **Penetration time of glove material** The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

• Eye protection:



Tightly sealed goggles

9 Physical and chemical properties

Appearance:	
Form:	Liquid
Color:	According to product specification
Odor:	Characteristic
Odor threshold:	Not determined.
pH-value at 20 °C (68 °F):	6.8
Change in condition	
Melting point/Melting range:	Undetermined.
Boiling point/Boiling range:	100 °C (212 °F)
Flash point:	Not applicable.
Flammability (solid, gaseous):	Not applicable.
Decomposition temperature:	Not determined.
Ignition temperature:	Product is not selfigniting.
Danger of explosion:	Product does not present an explosion hazard.
Explosion limits:	
Lower:	Not determined.
Upper:	Not determined.
Vapor pressure at 20 °C (68 °F):	23 hPa (17.3 mm Hg)
Density:	Not determined.
Relative density	Not determined.
Vapor density	Not determined.
Evaporation rate	Not determined.
Solubility in / Miscibility with	
Water:	Fully miscible.

Printing date 06/27/2023

Revision date 06/27/2023

Trade name: TNS Buffer Solution pH 6.8

	(Contd. from page 5)
Not determined	
Not determined.	
87.4 %	
0.00 %	
0.0 g/l / 0.00 lb/gal	
12.6 %	
No further relevant information available.	
	87.4 % 0.00 % 0.0 g/l / 0.00 lb/gal 12.6 %

10 Stability and reactivity

- · Reactivity No further relevant information available.
- · Chemical stability
- Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.
- Possibility of hazardous reactions No dangerous reactions known.
- Conditions to avoid No further relevant information available.
- · Incompatible materials: No further relevant information available.
- Hazardous decomposition products: No dangerous decomposition products known.

11 Toxicological information

· Information on toxicological effects

• Acute toxicity:

7647-14-5 Sodiu	um chloride		
Oral	LDLO	1,000 mg/kg (man)	
	TDLO	650 ml/kg (man)	
	LD50	4,000 mg/kg (mouse)	
		3,000 mg/kg (rat)	
	LD50	4 g/kg (mouse)	
Inhalative	LC50	320 mg/m³ (mouse)	
	TCLO	0.63 mg/m³ (hmn)	
	LCLO	29,300 mg/m³/7h (mouse)	
Irritation of skin	Irritation	500 mg/24h (rabbit) mild	
Irritation of eyes	Irritation	100 mg/24h (rabbit) moderate	
	Intraperitoneal LD50	2,602 mg/kg (mouse)	
	Subcutaneous LD50	31.6 mg/kg (rat)	
	Intravenous LD50	59.5 mg/kg (rat)	
	Data	15 mg/3D (hmn) mild	
	Subcutaneous LD50	3 g/kg (mouse)	

Printing date 06/27/2023

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Trade name: TNS Buffer Solution pH 6.8

		(Contd. from page 6)			
77-92-9 citric acid					
Oral	LD50	5,040 mg/kg (mouse)			
 Primary irritant effect: on the skin: No irritant effect. on the eye: Irritating effect. Sensitization: No sensitizing effects known. Additional toxicological information: The product shows the following dangers according to internally approved calculation methods fo preparations: Irritant 					
· Carcinogenic c	ategories				
· IARC (Internation	· IARC (International Agency for Research on Cancer)				
None of the ingr	edients is listed.				
· NTP (National 1	oxicology Program)				
None of the ingr	edients is listed.				
OSHA-Ca (Occi	upational Safety & He	ealth Administration)			
None of the ingr	odianta in listad				

12 Ecological information

- · Toxicity
- · Aquatic toxicity: No further relevant information available.
- Persistence and degradability No further relevant information available.
- Behavior in environmental systems:
- · Bioaccumulative potential No further relevant information available.
- Mobility in soil No further relevant information available.
- · Additional ecological information:
- · General notes:

Water hazard class 1 (Self-assessment): slightly hazardous for water

Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.

- · Results of PBT and vPvB assessment
- · PBT: Not applicable.
- · vPvB: Not applicable.
- Other adverse effects No further relevant information available.

13 Disposal considerations

- · Waste treatment methods
- · Recommendation:

Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

- · Uncleaned packagings:
- Recommendation: Disposal must be made according to official regulations.
- · Recommended cleansing agent: Water, if necessary with cleansing agents.

(Contd. on page 8)

Printing date 06/27/2023

Revision date 06/27/2023

Trade name: TNS Buffer Solution pH 6.8

(Contd. from page 7)

4 Transport information	
· UN-Number · DOT, IMDG, IATA	not regulated
 UN proper shipping name DOT, IMDG, IATA 	not regulated
· Transport hazard class(es)	
· DOT, ADN, IMDG, IATA · Class	not regulated
 Packing group DOT, IMDG, IATA 	not regulated
· Environmental hazards:	Not applicable.
· Special precautions for user	Not applicable.
 Transport in bulk according to Annex MARPOL73/78 and the IBC Code 	x II of Not applicable.
· UN "Model Regulation":	not regulated

15 Regulatory information

• Safety, health and environmental regulations/legislation specific for the substance or mixture No further relevant information available.

· Sara

· Section 355 (extremely hazardous substances):

None of the ingredients is listed.

· Section 313 (Specific toxic chemical listings):

None of the ingredients is listed.

• TSCA (Toxic Substances Control Act):

All components have the value ACTIVE.

· Hazardous Air Pollutants

None of the ingredients is listed.

· Proposition 65

· Chemicals known to cause cancer:

None of the ingredients is listed.

· Chemicals known to cause reproductive toxicity for females:

None of the ingredients is listed.

· Chemicals known to cause reproductive toxicity for males:

None of the ingredients is listed.

· Chemicals known to cause developmental toxicity:

None of the ingredients is listed.

Carcinogenic categories

· EPA (Environmental Protection Agency)

None of the ingredients is listed.

(Contd. on page 9)

Printing date 06/27/2023

Revision date 06/27/2023

Trade name: TNS Buffer Solution pH 6.8

(Contd. from page 8)

• TLV (Threshold Limit Value)

None of the ingredients is listed.

· NIOSH-Ca (National Institute for Occupational Safety and Health)

None of the ingredients is listed.

· Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

16 Other information

All chemicals may pose unknown hazards and should be used with caution. This SDS applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this SDS. Cayman Chemical Company assumes no responsibility for incidental or consequential damages, including lost profits, arising from the use of these data. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this SDS is based on technical data judged to be reliable, Cayman Chemical Company assumes no responsibility for the completeness or accuracy of the information contained herein.

- · Department issuing SDS: Environment protection department.
- · Contact: -
- Date of preparation / last revision 06/27/2023

 Abbreviations and acronyms: IMDG: International Maritime Code for Dangerous Goods DOT: US Department of Transportation IATA: International Air Transport Association EINECS: European Inventory of Existing Commercial Chemical Substances ELINCS: European List of Notified Chemical Substances CAS: Chemical Abstracts Service (division of the American Chemical Society) NFPA: National Fire Protection Association (USA) HMIS: Hazardous Materials Identification System (USA) VOC: Volatile Organic Compounds (USA, EU) LC50: Lethal concentration, 50 percent LD50: Lethal dose, 50 percent PBT: Persistent, Bioaccumulative and Toxic vPvB: very Persistent and very Bioaccumulative NIOSH: National Institute for Occupational Safety OSHA: Occupational Safety & Health TLV: Threshold Limit Value PEL: Permissible Exposure Limit **REL: Recommended Exposure Limit** Eye Irritation 2A: Serious eye damage/eye irritation - Category 2A Specific Target Organ Toxicity - Repeated Exposure 2: Specific target organ toxicity (repeated exposure) - Category 2



Printing date 06/27/2023

Revision date 06/27/2023

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1 Identification

- · Product identifier
- Trade name: TNS Buffer Solution pH 7.2
- Article number: 400642
- **Application of the substance / the mixture** This product is for research use - Not for human or veterinary diagnostic or therapeutic use.
- · Details of the supplier of the safety data sheet

• **Manufacturer/Supplier:** Cayman Chemical Co. 1180 E. Ellsworth Rd. Ann Arbor, MI 48108 USA

 Information department: Product safety department
 Emergency telephone number: During normal opening times: +1 (734) 971-3335 US/CANADA: 800-424-9300 Outside US/CANADA: 703-741-5970

2 Hazard(s) identification

· Classification of the substance or mixture	
GHS08 Health hazard	
Specific Target Organ Toxicity - Repeated Exposure H373 May cause damage to organ 2	
GHS07	
Eye Irritation 2A H319 Causes serious eye irritation.	
 Label elements GHS label elements The product is classified and labeled according to the Globally Harmonized System (GHS). (Cor 	ntd. on page 2)

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Safety Data Sheet acc. to OSHA HCS

Revision date 06/27/2023

Printing date 06/27/2023 Trade name: TNS Buffer Solution pH 7.2 (Contd. from page 1) · Hazard pictograms GHS07 GHS08 Signal word Warning · Hazard-determining components of labeling: Sodium chloride · Hazard statements H319 Causes serious eye irritation. H373 May cause damage to organs through prolonged or repeated exposure. Precautionary statements P260 Do not breathe dust/fume/gas/mist/vapors/spray. P264 Wash thoroughly after handling. P280 Wear eye protection / face protection. P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P314 Get medical advice/attention if you feel unwell. P337+P313 If eye irritation persists: Get medical advice/attention. P501 Dispose of contents/container in accordance with local/regional/national/international regulations. Classification system: · NFPA ratings (scale 0 - 4) Health = 2Fire = 0Reactivity = 0 · HMIS-ratings (scale 0 - 4) HEALTH 2 Health = 2 FIRE 0 Fire = 0Reactivity = 0 REACTIVITY 0 · Other hazards Results of PBT and vPvB assessment · **PBT:** Not applicable. · vPvB: Not applicable. **3** Composition/information on ingredients · Chemical characterization: Mixtures • **Description:** Mixture of the substances listed below with nonhazardous additions.

[•] Dangerous components:			
	CAS: 7647-14-5 RTECS: VZ4725000	Sodium chloride	8.764%
	CAS: 77-92-9 RTECS: GE7350000		3.836%
		(Contd.	on page 3)

87.4%

Safety Data Sheet acc. to OSHA HCS

Printing date 06/27/2023

Revision date 06/27/2023

Trade name: TNS Buffer Solution pH 7.2

(Contd. from page 2)

· Other ingredients

CAS: 7732-18-5 Water RTECS: ZC0110000

4 First-aid measures

· Description of first aid measures

General information:

Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.

- After inhalation: Supply fresh air; consult doctor in case of complaints.
- After skin contact: Generally the product does not irritate the skin.
- · After eye contact:
- Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
- · After swallowing: If symptoms persist consult doctor.
- · Information for doctor:
- Most important symptoms and effects, both acute and delayed No further relevant information available.
- Indication of any immediate medical attention and special treatment needed No further relevant information available.

5 Fire-fighting measures

- Extinguishing media
- **Suitable extinguishing agents:** Use fire fighting measures that suit the environment. A solid water stream may be inefficient.
- Special hazards arising from the substance or mixture 67-56-1During heating or in case of fire poisonous gases are produced.
- Advice for firefighters
- · Protective equipment: Mouth respiratory protective device.

6 Accidental release measures

- Personal precautions, protective equipment and emergency procedures Mount respiratory protective device.
- Environmental precautions: Dilute with plenty of water.
- Do not allow to enter sewers/ surface or ground water. Methods and material for containment and cleaning up: Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust). Dispose contaminated material as waste according to section 13.
- Ensure adequate ventilation. • **Reference to other sections** See Section 7 for information on safe handling. See Section 8 for information on personal protection equipment.
- See Section 13 for disposal information.
- Protective Action Criteria for Chemicals

· PAC-1:

None of the ingredients is listed.

(Contd. on page 4)

US

Printing date 06/27/2023

Revision date 06/27/2023

Trade name: TNS Buffer Solution pH 7.2

(Contd. from page 3)

· PAC-2:

None of the ingredients is listed.

· PAC-3:

None of the ingredients is listed.

7 Handling and storage

- · Handling:
- **Precautions for safe handling** Ensure good ventilation/exhaustion at the workplace. Prevent formation of aerosols.
- Information about protection against explosions and fires: Keep respiratory protective device available.
- · Conditions for safe storage, including any incompatibilities
- Storage: Store in accordance with information listed on the product insert.
- Requirements to be met by storerooms and receptacles: No special requirements.
- Information about storage in one common storage facility: Not required.
- Further information about storage conditions: Keep receptacle tightly sealed.
- Specific end use(s) No further relevant information available.

8 Exposure controls/personal protection

· Additional information about design of technical systems: No further data; see section 7.

- · Control parameters
- Components with limit values that require monitoring at the workplace: The product does not contain any relevant quantities of materials with critical values that have to be
- monitored at the workplace.
- · Additional information: The lists that were valid during the creation were used as basis.
- · Exposure controls
- Personal protective equipment:
- General protective and hygienic measures:
- Keep away from foodstuffs, beverages and feed.
- Immediately remove all soiled and contaminated clothing.
- Wash hands before breaks and at the end of work.
- Store protective clothing separately.
- Avoid contact with the eyes.

Avoid contact with the eyes and skin.

· Breathing equipment:

In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.

Protection of hands:



Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation. Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.

(Contd. on page 5)

[–] US

Printing date 06/27/2023

Revision date 06/27/2023

Trade name: TNS Buffer Solution pH 7.2

(Contd. from page 4) Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

· Material of gloves

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

Penetration time of glove material The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

• Eye protection:



Tightly sealed goggles

9 Physical and chemical properties

Appearance:	
Form:	Liquid
Color:	According to product specification
Odor:	Characteristic
Odor threshold:	Not determined.
pH-value at 20 °C (68 °F):	7.2
Change in condition	
Melting point/Melting range:	Undetermined.
Boiling point/Boiling range:	100 °C (212 °F)
Flash point:	Not applicable.
Flammability (solid, gaseous):	Not applicable.
Decomposition temperature:	Not determined.
Ignition temperature:	Product is not selfigniting.
Danger of explosion:	Product does not present an explosion hazard.
Explosion limits:	
Lower:	Not determined.
Upper:	Not determined.
Vapor pressure at 20 °C (68 °F):	23 hPa (17.3 mm Hg)
Density:	Not determined.
Relative density	Not determined.
Vapor density	Not determined.
Evaporation rate	Not determined.
Solubility in / Miscibility with	
Water:	Fully miscible.

Printing date 06/27/2023

Revision date 06/27/2023

Trade name: TNS Buffer Solution pH 7.2

	(Contd. from pa	ige 5)
· Viscosity:		
Dynamic:	Not determined.	
Kinematic:	Not determined.	
· Solvent content:		
Water:	87.4 %	
VOC content:	0.00 %	
	0.0 g/l / 0.00 lb/gal	
Solids content:	12.6 %	
· Other information	No further relevant information available.	

10 Stability and reactivity

- · Reactivity No further relevant information available.
- · Chemical stability
- Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.
- Possibility of hazardous reactions No dangerous reactions known.
- Conditions to avoid No further relevant information available.
- · Incompatible materials: No further relevant information available.
- Hazardous decomposition products: No dangerous decomposition products known.

11 Toxicological information

· Information on toxicological effects

• Acute toxicity:

7647-14-5 Sodium chloride			
Oral	LDLO	1,000 mg/kg (man)	
	TDLO	650 ml/kg (man)	
	LD50	4,000 mg/kg (mouse)	
		3,000 mg/kg (rat)	
	LD50	4 g/kg (mouse)	
Inhalative	LC50	320 mg/m³ (mouse)	
	TCLO	0.63 mg/m³ (hmn)	
	LCLO	29,300 mg/m³/7h (mouse)	
Irritation of skin	Irritation	500 mg/24h (rabbit) mild	
Irritation of eyes	Irritation	100 mg/24h (rabbit) moderate	
	Intraperitoneal LD50	2,602 mg/kg (mouse)	
	Subcutaneous LD50	31.6 mg/kg (rat)	
	Intravenous LD50	59.5 mg/kg (rat)	
	Data	15 mg/3D (hmn) mild	
	Subcutaneous LD50	3 g/kg (mouse)	

US

Printing date 06/27/2023

Revision date 06/27/2023

Trade name: TNS Buffer Solution pH 7.2

		(Contd. from page 6)				
77-92-9 citric acid						
Oral LD50 5,040 mg/kg (mouse)						
• on the skin: No • on the eye: Irrit • Sensitization: N • Additional toxic						
· Carcinogenic c	ategories					
· IARC (Internation	· IARC (International Agency for Research on Cancer)					
None of the ingr	None of the ingredients is listed. • NTP (National Toxicology Program) None of the ingredients is listed.					
· NTP (National 1						
None of the ingr						
OSHA-Ca (Occ	upational Safety & H	ealth Administration)				
None of the ingredients is listed.						

12 Ecological information

- · Toxicity
- · Aquatic toxicity: No further relevant information available.
- Persistence and degradability No further relevant information available.
- Behavior in environmental systems:
- · Bioaccumulative potential No further relevant information available.
- · Mobility in soil No further relevant information available.
- · Additional ecological information:
- · General notes:

Water hazard class 1 (Self-assessment): slightly hazardous for water

Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.

- · Results of PBT and vPvB assessment
- · PBT: Not applicable.
- · vPvB: Not applicable.
- Other adverse effects No further relevant information available.

13 Disposal considerations

- · Waste treatment methods
- · Recommendation:

Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

- · Uncleaned packagings:
- Recommendation: Disposal must be made according to official regulations.
- · Recommended cleansing agent: Water, if necessary with cleansing agents.

(Contd. on page 8)

Printing date 06/27/2023

Revision date 06/27/2023

Trade name: TNS Buffer Solution pH 7.2

(Contd. from page 7)

Transport information	
· UN-Number · DOT, IMDG, IATA	not regulated
 UN proper shipping name DOT, IMDG, IATA 	not regulated
· Transport hazard class(es)	
· DOT, ADN, IMDG, IATA · Class	not regulated
 Packing group DOT, IMDG, IATA 	not regulated
· Environmental hazards:	Not applicable.
· Special precautions for user	Not applicable.
 Transport in bulk according to Annex MARPOL73/78 and the IBC Code 	c II of Not applicable.
· UN "Model Regulation":	not regulated

15 Regulatory information

• Safety, health and environmental regulations/legislation specific for the substance or mixture No further relevant information available.

· Sara

· Section 355 (extremely hazardous substances):

None of the ingredients is listed.

· Section 313 (Specific toxic chemical listings):

None of the ingredients is listed.

• TSCA (Toxic Substances Control Act):

All components have the value ACTIVE.

· Hazardous Air Pollutants

None of the ingredients is listed.

· Proposition 65

· Chemicals known to cause cancer:

None of the ingredients is listed.

· Chemicals known to cause reproductive toxicity for females:

None of the ingredients is listed.

· Chemicals known to cause reproductive toxicity for males:

None of the ingredients is listed.

· Chemicals known to cause developmental toxicity:

None of the ingredients is listed.

Carcinogenic categories

· EPA (Environmental Protection Agency)

None of the ingredients is listed.

(Contd. on page 9)

US

Printing date 06/27/2023

Revision date 06/27/2023

Trade name: TNS Buffer Solution pH 7.2

(Contd. from page 8)

• TLV (Threshold Limit Value)

None of the ingredients is listed.

· NIOSH-Ca (National Institute for Occupational Safety and Health)

None of the ingredients is listed.

· Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

16 Other information

All chemicals may pose unknown hazards and should be used with caution. This SDS applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this SDS. Cayman Chemical Company assumes no responsibility for incidental or consequential damages, including lost profits, arising from the use of these data. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this SDS is based on technical data judged to be reliable, Cayman Chemical Company assumes no responsibility for the completeness or accuracy of the information contained herein.

- · Department issuing SDS: Environment protection department.
- · Contact: -
- Date of preparation / last revision 06/27/2023

 Abbreviations and acronyms: IMDG: International Maritime Code for Dangerous Goods DOT: US Department of Transportation IATA: International Air Transport Association EINECS: European Inventory of Existing Commercial Chemical Substances ELINCS: European List of Notified Chemical Substances CAS: Chemical Abstracts Service (division of the American Chemical Society) NFPA: National Fire Protection Association (USA) HMIS: Hazardous Materials Identification System (USA) VOC: Volatile Organic Compounds (USA, EU) LC50: Lethal concentration, 50 percent LD50: Lethal dose, 50 percent PBT: Persistent, Bioaccumulative and Toxic vPvB: very Persistent and very Bioaccumulative NIOSH: National Institute for Occupational Safety OSHA: Occupational Safety & Health TLV: Threshold Limit Value PEL: Permissible Exposure Limit **REL: Recommended Exposure Limit** Eye Irritation 2A: Serious eye damage/eye irritation - Category 2A Specific Target Organ Toxicity - Repeated Exposure 2: Specific target organ toxicity (repeated exposure) - Category 2



Printing date 06/27/2023

Revision date 06/27/2023

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1 Identification

- · Product identifier
- Trade name: TNS Buffer Solution pH 7.6
- Article number: 400643
- **Application of the substance / the mixture** This product is for research use - Not for human or veterinary diagnostic or therapeutic use.
- · Details of the supplier of the safety data sheet

• **Manufacturer/Supplier:** Cayman Chemical Co. 1180 E. Ellsworth Rd. Ann Arbor, MI 48108 USA

 Information department: Product safety department
 Emergency telephone number: During normal opening times: +1 (734) 971-3335 US/CANADA: 800-424-9300 Outside US/CANADA: 703-741-5970

2 Hazard(s) identification

• Classification of the substance or r	mixture
GHS08 Health hazard	
Specific Target Organ Toxicity - Repe 2	eated Exposure H373 May cause damage to organs through prolonged or repeated exposure.
GHS07	
Eye Irritation 2A	H319 Causes serious eye irritation.
 Label elements GHS label elements The product is classified and labeled a 	according to the Globally Harmonized System (GHS). (Contd. on page 2)
	03-

Printing date 06/27/2023

Revision date 06/27/2023

Frade name: TNS Buffer Solution pH 7.6	
· Hazard pictograms	
\wedge	(Contd. from page
GHS07 GHS08	
· Signal word Warning	
 Hazard-determining components of labeling: Sodium chloride Hazard statements H319 Causes serious eye irritation. H373 May cause damage to organs through prolonged or repeat Precautionary statements P260 Do not breathe dust/fume/gas/mist/vapors/sp P264 Wash thoroughly after handling. P280 Wear eye protection / face protection. P305+P351+P338 If in eyes: Rinse cautiously with water for sew present and easy to do. Continue rinsing. P314 Get medical advice/attention if you feel unwe P337+P313 If eye irritation persists: Get medical advice/a P501 Dispose of contents/container in accordance regulations. Classification system: NFPA ratings (scale 0 - 4)	oray. veral minutes. Remove contact lenses, II. attention.
Health = 2 Fire = 0 Reactivity = 0	
· HMIS-ratings (scale 0 - 4)	
HEALTH2FIRE0Fire = 0REACTIVITY0	
 Other hazards Results of PBT and vPvB assessment 	
• PBT: Not applicable. • vPvB: Not applicable.	
 • PBT: Not applicable. • vPvB: Not applicable. 	
· PBT: Not applicable.	zardous additions.
 PBT: Not applicable. vPvB: Not applicable. 3 Composition/information on ingredients Chemical characterization: Mixtures 	zardous additions.
 PBT: Not applicable. vPvB: Not applicable. 3 Composition/information on ingredients Chemical characterization: Mixtures Description: Mixture of the substances listed below with nonhazing the substances listed below wit	zardous additions. 8.764%

(Contd. on page 3)

US

87.4%

Safety Data Sheet acc. to OSHA HCS

Printing date 06/27/2023

Revision date 06/27/2023

Trade name: TNS Buffer Solution pH 7.6

(Contd. from page 2)

· Other ingredients

CAS: 7732-18-5 Water RTECS: ZC0110000

4 First-aid measures

· Description of first aid measures

General information:

Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.

- After inhalation: Supply fresh air; consult doctor in case of complaints.
- After skin contact: Generally the product does not irritate the skin.
- · After eye contact:
- Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
- · After swallowing: If symptoms persist consult doctor.
- · Information for doctor:
- Most important symptoms and effects, both acute and delayed No further relevant information available.
- Indication of any immediate medical attention and special treatment needed No further relevant information available.

5 Fire-fighting measures

- Extinguishing media
- **Suitable extinguishing agents:** Use fire fighting measures that suit the environment. A solid water stream may be inefficient.
- Special hazards arising from the substance or mixture 67-56-1During heating or in case of fire poisonous gases are produced.
- Advice for firefighters
- · Protective equipment: Mouth respiratory protective device.

6 Accidental release measures

- Personal precautions, protective equipment and emergency procedures Mount respiratory protective device.
- Environmental precautions: Dilute with plenty of water.
- Do not allow to enter sewers/ surface or ground water. **Methods and material for containment and cleaning up:** Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust). Dispose contaminated material as waste according to section 13.
- Ensure adequate ventilation.
- Reference to other sections
 See Section 7 for information on safe handling.
 See Section 8 for information on personal protection equipment.
- See Section 13 for disposal information.
- Protective Action Criteria for Chemicals

· PAC-1:

None of the ingredients is listed.

(Contd. on page 4)

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Trade name: TNS Buffer Solution pH 7.6

(Contd. from page 3)

· PAC-2:

None of the ingredients is listed.

· PAC-3:

None of the ingredients is listed.

7 Handling and storage

- · Handling:
- **Precautions for safe handling** Ensure good ventilation/exhaustion at the workplace. Prevent formation of aerosols.
- Information about protection against explosions and fires: Keep respiratory protective device available.
- · Conditions for safe storage, including any incompatibilities
- Storage: Store in accordance with information listed on the product insert.
- Requirements to be met by storerooms and receptacles: No special requirements.
- Information about storage in one common storage facility: Not required.
- Further information about storage conditions: Keep receptacle tightly sealed.
- Specific end use(s) No further relevant information available.

8 Exposure controls/personal protection

· Additional information about design of technical systems: No further data; see section 7.

- · Control parameters
- Components with limit values that require monitoring at the workplace: The product does not contain any relevant quantities of materials with critical values that have to be
- monitored at the workplace.
- Additional information: The lists that were valid during the creation were used as basis.
- · Exposure controls
- Personal protective equipment:
- General protective and hygienic measures:
- Keep away from foodstuffs, beverages and feed.
- Immediately remove all soiled and contaminated clothing.
- Wash hands before breaks and at the end of work.
- Store protective clothing separately.
- Avoid contact with the eyes.

Avoid contact with the eyes and skin.

Breathing equipment:

In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.

Protection of hands:



Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation. Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.

(Contd. on page 5)

[–] US

Printing date 06/27/2023

Revision date 06/27/2023

Trade name: TNS Buffer Solution pH 7.6

(Contd. from page 4) Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

· Material of gloves

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

Penetration time of glove material The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

• Eye protection:



Tightly sealed goggles

9 Physical and chemical properties

Appearance:	
Form:	Liquid
Color:	According to product specification
Odor:	Characteristic
Odor threshold:	Not determined.
pH-value at 20 °C (68 °F):	7.6
Change in condition	
Melting point/Melting range:	Undetermined.
Boiling point/Boiling range:	100 °C (212 °F)
Flash point:	Not applicable.
Flammability (solid, gaseous):	Not applicable.
Decomposition temperature:	Not determined.
Ignition temperature:	Product is not selfigniting.
Danger of explosion:	Product does not present an explosion hazard.
Explosion limits:	
Lower:	Not determined.
Upper:	Not determined.
Vapor pressure at 20 °C (68 °F):	23 hPa (17.3 mm Hg)
Density:	Not determined.
Relative density	Not determined.
Vapor density	Not determined.
Evaporation rate	Not determined.
Solubility in / Miscibility with	
Water:	Fully miscible.

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Trade name: TNS Buffer Solution pH 7.6

	(Contd. from page	e 5)
Viscosity:		
Dynamic: Kinematic:	Not determined. Not determined.	
	Not determined.	_
 Solvent content: Water: 	87.4 %	
VOC content:	0.00 %	
	0.0 g/l / 0.00 lb/gal	
Solids content:	12.6 %	
• Other information	No further relevant information available.	

10 Stability and reactivity

- · Reactivity No further relevant information available.
- · Chemical stability
- Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.
- Possibility of hazardous reactions No dangerous reactions known.
- Conditions to avoid No further relevant information available.
- · Incompatible materials: No further relevant information available.
- Hazardous decomposition products: No dangerous decomposition products known.

11 Toxicological information

· Information on toxicological effects

• Acute toxicity:

7647-14-5 Sodium chloride			
Oral	LDLO	1,000 mg/kg (man)	
	TDLO	650 ml/kg (man)	
	LD50	4,000 mg/kg (mouse)	
		3,000 mg/kg (rat)	
	LD50	4 g/kg (mouse)	
Inhalative	LC50	320 mg/m³ (mouse)	
	TCLO	0.63 mg/m³ (hmn)	
	LCLO	29,300 mg/m³/7h (mouse)	
Irritation of skin	Irritation	500 mg/24h (rabbit) mild	
Irritation of eyes	Irritation	100 mg/24h (rabbit) moderate	
	Intraperitoneal LD50	2,602 mg/kg (mouse)	
	Subcutaneous LD50	31.6 mg/kg (rat)	
	Intravenous LD50	59.5 mg/kg (rat)	
	Data	15 mg/3D (hmn) mild	
	Subcutaneous LD50	3 g/kg (mouse)	

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Trade name: TNS Buffer Solution pH 7.6

		(Contd. from page 6)				
77-92-9 citric acid						
Oral	LD50	5,040 mg/kg (mouse)				
on the skin: No on the eye: Irrita Sensitization: N Additional toxic						
· Carcinogenic c	· Carcinogenic categories					
· IARC (Internatio	· IARC (International Agency for Research on Cancer)					
None of the ingre	None of the ingredients is listed. • NTP (National Toxicology Program) None of the ingredients is listed.					
· NTP (National T						
None of the ingre						
· OSHA-Ca (Occı	upational Safety & H	ealth Administration)				
None of the ingre	None of the ingredients is listed.					

12 Ecological information

- · Toxicity
- · Aquatic toxicity: No further relevant information available.
- Persistence and degradability No further relevant information available.
- Behavior in environmental systems:
- · Bioaccumulative potential No further relevant information available.
- Mobility in soil No further relevant information available.
- · Additional ecological information:
- · General notes:

Water hazard class 1 (Self-assessment): slightly hazardous for water

Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.

- · Results of PBT and vPvB assessment
- · PBT: Not applicable.
- · vPvB: Not applicable.
- Other adverse effects No further relevant information available.

13 Disposal considerations

- · Waste treatment methods
- · Recommendation:

Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

- · Uncleaned packagings:
- Recommendation: Disposal must be made according to official regulations.
- · Recommended cleansing agent: Water, if necessary with cleansing agents.

(Contd. on page 8)

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Trade name: TNS Buffer Solution pH 7.6

(Contd. from page 7)

4 Transport information	
· UN-Number · DOT, IMDG, IATA	not regulated
 UN proper shipping name DOT, IMDG, IATA 	not regulated
· Transport hazard class(es)	
· DOT, ADN, IMDG, IATA · Class	not regulated
 Packing group DOT, IMDG, IATA 	not regulated
· Environmental hazards:	Not applicable.
· Special precautions for user	Not applicable.
 Transport in bulk according to Annex MARPOL73/78 and the IBC Code 	k II of Not applicable.
· UN "Model Regulation":	not regulated

15 Regulatory information

• Safety, health and environmental regulations/legislation specific for the substance or mixture No further relevant information available.

· Sara

· Section 355 (extremely hazardous substances):

None of the ingredients is listed.

· Section 313 (Specific toxic chemical listings):

None of the ingredients is listed.

• TSCA (Toxic Substances Control Act):

All components have the value ACTIVE.

· Hazardous Air Pollutants

None of the ingredients is listed.

· Proposition 65

· Chemicals known to cause cancer:

None of the ingredients is listed.

· Chemicals known to cause reproductive toxicity for females:

None of the ingredients is listed.

· Chemicals known to cause reproductive toxicity for males:

None of the ingredients is listed.

· Chemicals known to cause developmental toxicity:

None of the ingredients is listed.

Carcinogenic categories

· EPA (Environmental Protection Agency)

None of the ingredients is listed.

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Trade name: TNS Buffer Solution pH 7.6

(Contd. from page 8)

• TLV (Threshold Limit Value)

None of the ingredients is listed.

· NIOSH-Ca (National Institute for Occupational Safety and Health)

None of the ingredients is listed.

• Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

16 Other information

All chemicals may pose unknown hazards and should be used with caution. This SDS applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this SDS. Cayman Chemical Company assumes no responsibility for incidental or consequential damages, including lost profits, arising from the use of these data. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this SDS is based on technical data judged to be reliable, Cayman Chemical Company assumes no responsibility for the completeness or accuracy of the information contained herein.

- · Department issuing SDS: Environment protection department.
- · Contact: -
- Date of preparation / last revision 06/27/2023

 Abbreviations and acronyms: IMDG: International Maritime Code for Dangerous Goods DOT: US Department of Transportation IATA: International Air Transport Association EINECS: European Inventory of Existing Commercial Chemical Substances ELINCS: European List of Notified Chemical Substances CAS: Chemical Abstracts Service (division of the American Chemical Society) NFPA: National Fire Protection Association (USA) HMIS: Hazardous Materials Identification System (USA) VOC: Volatile Organic Compounds (USA, EU) LC50: Lethal concentration, 50 percent LD50: Lethal dose, 50 percent PBT: Persistent, Bioaccumulative and Toxic vPvB: very Persistent and very Bioaccumulative NIOSH: National Institute for Occupational Safety OSHA: Occupational Safety & Health TLV: Threshold Limit Value PEL: Permissible Exposure Limit **REL: Recommended Exposure Limit** Eye Irritation 2A: Serious eye damage/eye irritation - Category 2A Specific Target Organ Toxicity - Repeated Exposure 2: Specific target organ toxicity (repeated exposure) - Category 2



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1 Identification

- · Product identifier
- Trade name: TNS Buffer Solution pH 8.0
- Article number: 400644
- **Application of the substance / the mixture** This product is for research use - Not for human or veterinary diagnostic or therapeutic use.
- · Details of the supplier of the safety data sheet

• **Manufacturer/Supplier:** Cayman Chemical Co. 1180 E. Ellsworth Rd. Ann Arbor, MI 48108 USA

 Information department: Product safety department
 Emergency telephone number: During normal opening times: +1 (734) 971-3335 US/CANADA: 800-424-9300 Outside US/CANADA: 703-741-5970

2 Hazard(s) identification

• Classification of the substance o	or mixture
GHS08 Health hazard	
Specific Target Organ Toxicity - Re 2	peated Exposure H373 May cause damage to organs through prolonged or repeated exposure.
GHS07	
Eye Irritation 2A	H319 Causes serious eye irritation.
 Label elements GHS label elements The product is classified and labele 	ed according to the Globally Harmonized System (GHS). (Contd. on page 2)
	03

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rade name: TNS Buffe		
	er Solution pH 8.0	
· Hazard pictograms		(Contd. from page
GHS07 GHS08		
Signal word Warnin	na	
Sodium chloride Hazard statements H319 Causes seriou H373 May cause dan Precautionary state P260 D P264 W P280 W P305+P351+P338 lf P314 G P337+P313 lf P501 D	as eye irritation. mage to organs through prolonged or repenents bo not breathe dust/fume/gas/mist/vapors Vash thoroughly after handling. Vear eye protection / face protection. in eyes: Rinse cautiously with water for resent and easy to do. Continue rinsing. Get medical advice/attention if you feel ur eye irritation persists: Get medical advice Dispose of contents/container in accordate egulations.	s/spray. several minutes. Remove contact lenses, nwell.
•	- 2	
200 Health Fire = 0 Reactiv)	
Fire = 0) vity = 0	
 HMIS-ratings (scale HEALTH 2 Health FIRE 0) vity = 0 e 0 - 4) n = 2	
HMIS-ratings (scale HEALTH 2 Fire = 0 HEALTH 2 Fire = 0 Fire =	yity = 0 $\mathbf{e} \ 0 - 4$) $\mathbf{n} = 2$ 0 ivity = 0 $1 \mathbf{vPvB}$ assessment	
Fire = C Reactive HMIS-ratings (scale HEALTH 2 HEALTH 2 Health FIRE 0 Fire = REACTIVITY 0 Reactive Cother hazards Results of PBT and PBT: Not applicable vPvB: Not applicable) vity = 0 e 0 - 4) n = 2 0 ivity = 0 i vPvB assessment e.	
 Fire = 0 Reactive HMIS-ratings (scale HEALTH 2 HEALTH 2 REACTIVITY 0 Other hazards Other hazards Results of PBT and PBT: Not applicable vPvB: Not applicable vPvB: Not applicable Composition/inf Chemical character 	0 vity = 0 e 0 - 4) n = 2 0 ivity = 0 1 vPvB assessment e. formation on ingredients	nhazardous additions.
Fire = C Reactive HMIS-ratings (scale HEALTH 2 HEALTH 2 HEALTH 2 HEALTH 2 Fire = REACTIVITY 0 Reactive Other hazards Results of PBT and PBT: Not applicable vPvB: Not applicable VPvB: Not applicable Chemical character Description: Mixture) vity = 0 e 0 - 4) n = 2 0 ivity = 0 ivity = 0 i vPvB assessment e. formation on ingredients rization: Mixtures e of the substances listed below with nor	nhazardous additions.
 Fire = 0 Reactive HMIS-ratings (scale HEALTH 2 HEALTH 2 REACTIVITY 0 Other hazards Other hazards Results of PBT and PBT: Not applicable vPvB: Not applicable vPvB: Not applicable Composition/inf Chemical character 	<pre>0 vity = 0 vity = 0 e 0 - 4) n = 2 0 ivity = 0 vPvB assessment . e. formation on ingredients rization: Mixtures e of the substances listed below with nor nents: Sodium chloride</pre>	nhazardous additions. 8.7649

87.4%

Safety Data Sheet acc. to OSHA HCS

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Trade name: TNS Buffer Solution pH 8.0

(Contd. from page 2)

· Other ingredients

CAS: 7732-18-5 Water RTECS: ZC0110000

4 First-aid measures

· Description of first aid measures

General information:

Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.

- After inhalation: Supply fresh air; consult doctor in case of complaints.
- After skin contact: Generally the product does not irritate the skin.
- · After eye contact:
- Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
- · After swallowing: If symptoms persist consult doctor.
- · Information for doctor:
- Most important symptoms and effects, both acute and delayed No further relevant information available.
- Indication of any immediate medical attention and special treatment needed No further relevant information available.

5 Fire-fighting measures

- Extinguishing media
- **Suitable extinguishing agents:** Use fire fighting measures that suit the environment. A solid water stream may be inefficient.
- Special hazards arising from the substance or mixture 67-56-1During heating or in case of fire poisonous gases are produced.
- · Advice for firefighters
- · Protective equipment: Mouth respiratory protective device.

6 Accidental release measures

- Personal precautions, protective equipment and emergency procedures Mount respiratory protective device.
- Environmental precautions: Dilute with plenty of water. Do not allow to enter sewers/ surface or ground water.
- Methods and material for containment and cleaning up: Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust). Dispose contaminated material as waste according to section 13. Ensure adequate ventilation.
- Reference to other sections
 See Section 7 for information on safe handling.
 See Section 8 for information on personal protection equipment.
 See Section 13 for disposal information.
- Protective Action Criteria for Chemicals

· PAC-1:

None of the ingredients is listed.

(Contd. on page 4)

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Trade name: TNS Buffer Solution pH 8.0

(Contd. from page 3)

· PAC-2:

None of the ingredients is listed.

· PAC-3:

None of the ingredients is listed.

7 Handling and storage

- · Handling:
- **Precautions for safe handling** Ensure good ventilation/exhaustion at the workplace. Prevent formation of aerosols.
- Information about protection against explosions and fires: Keep respiratory protective device available.
- · Conditions for safe storage, including any incompatibilities
- Storage: Store in accordance with information listed on the product insert.
- Requirements to be met by storerooms and receptacles: No special requirements.
- Information about storage in one common storage facility: Not required.
- Further information about storage conditions: Keep receptacle tightly sealed.
- Specific end use(s) No further relevant information available.

8 Exposure controls/personal protection

· Additional information about design of technical systems: No further data; see section 7.

- · Control parameters
- Components with limit values that require monitoring at the workplace: The product does not contain any relevant quantities of materials with critical values that have to be
- monitored at the workplace.
- Additional information: The lists that were valid during the creation were used as basis.
- · Exposure controls
- · Personal protective equipment:
- General protective and hygienic measures:
- Keep away from foodstuffs, beverages and feed.
- Immediately remove all soiled and contaminated clothing.
- Wash hands before breaks and at the end of work.
- Store protective clothing separately.
- Avoid contact with the eyes.

Avoid contact with the eyes and skin.

Breathing equipment:

In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.

Protection of hands:



Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation. Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.

(Contd. on page 5)

Printing date 06/27/2023

Revision date 06/27/2023

Trade name: TNS Buffer Solution pH 8.0

(Contd. from page 4) Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

· Material of gloves

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

• **Penetration time of glove material** The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

• Eye protection:



Tightly sealed goggles

9 Physical and chemical properties

General Information Appearance:	
Form:	Liquid
Color:	According to product specification
Odor:	Characteristic
Odor threshold:	Not determined.
pH-value at 20 °C (68 °F):	8
Change in condition	
Melting point/Melting range:	Undetermined.
Boiling point/Boiling range:	100 °C (212 °F)
Flash point:	Not applicable.
Flammability (solid, gaseous):	Not applicable.
Decomposition temperature:	Not determined.
Ignition temperature:	Product is not selfigniting.
Danger of explosion:	Product does not present an explosion hazard.
Explosion limits:	
Lower:	Not determined.
Upper:	Not determined.
Vapor pressure at 20 °C (68 °F):	23 hPa (17.3 mm Hg)
Density:	Not determined.
Relative density	Not determined.
Vapor density	Not determined.
Evaporation rate	Not determined.
Solubility in / Miscibility with	
Water:	Fully miscible.

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Trade name: TNS Buffer Solution pH 8.0

	(Contd. from page 5)
Not determined	
Not determined.	
87.4 %	
0.00 %	
0.0 g/l / 0.00 lb/gal	
12.6 %	
No further relevant information available.	
	87.4 % 0.00 % 0.0 g/l / 0.00 lb/gal 12.6 %

10 Stability and reactivity

- · Reactivity No further relevant information available.
- · Chemical stability
- Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.
- Possibility of hazardous reactions No dangerous reactions known.
- Conditions to avoid No further relevant information available.
- · Incompatible materials: No further relevant information available.
- Hazardous decomposition products: No dangerous decomposition products known.

11 Toxicological information

· Information on toxicological effects

• Acute toxicity:

7647-14-5 Sodium chloride			
Oral	LDLO	1,000 mg/kg (man)	
	TDLO	650 ml/kg (man)	
	LD50	4,000 mg/kg (mouse)	
		3,000 mg/kg (rat)	
	LD50	4 g/kg (mouse)	
Inhalative	LC50	320 mg/m³ (mouse)	
	TCLO	0.63 mg/m³ (hmn)	
	LCLO	29,300 mg/m³/7h (mouse)	
Irritation of skin	Irritation	500 mg/24h (rabbit) mild	
Irritation of eyes	Irritation	100 mg/24h (rabbit) moderate	
	Intraperitoneal LD50	2,602 mg/kg (mouse)	
	Subcutaneous LD50	31.6 mg/kg (rat)	
	Intravenous LD50	59.5 mg/kg (rat)	
	Data	15 mg/3D (hmn) mild	
	Subcutaneous LD50	3 g/kg (mouse)	

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Trade name: TNS Buffer Solution pH 8.0

		(Contd. from page 6)
77-92-9 citric a	cid	
Oral	LD50	5,040 mg/kg (mouse)
 Additional toxic 	irritant effect. ating effect. lo sensitizing effects l cological informatior	
· Carcinogenic c	ategories	
· IARC (Internation	onal Agency for Rese	earch on Cancer)
None of the ingr	edients is listed.	
· NTP (National 1	Coxicology Program)	
None of the ingr	edients is listed.	
OSHA-Ca (Occ	upational Safety & H	ealth Administration)
None of the ingr	adiants is listed	

12 Ecological information

- · Toxicity
- · Aquatic toxicity: No further relevant information available.
- Persistence and degradability No further relevant information available.
- Behavior in environmental systems:
- · Bioaccumulative potential No further relevant information available.
- Mobility in soil No further relevant information available.
- · Additional ecological information:
- · General notes:

Water hazard class 1 (Self-assessment): slightly hazardous for water

Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.

- · Results of PBT and vPvB assessment
- · PBT: Not applicable.
- · vPvB: Not applicable.
- Other adverse effects No further relevant information available.

13 Disposal considerations

- · Waste treatment methods
- · Recommendation:

Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

- · Uncleaned packagings:
- Recommendation: Disposal must be made according to official regulations.
- · Recommended cleansing agent: Water, if necessary with cleansing agents.

(Contd. on page 8)

Printing date 06/27/2023

Revision date 06/27/2023

Trade name: TNS Buffer Solution pH 8.0

(Contd. from page 7)

4 Transport information	
· UN-Number · DOT, IMDG, IATA	not regulated
 UN proper shipping name DOT, IMDG, IATA 	not regulated
· Transport hazard class(es)	
· DOT, ADN, IMDG, IATA · Class	not regulated
 Packing group DOT, IMDG, IATA 	not regulated
· Environmental hazards:	Not applicable.
· Special precautions for user	Not applicable.
 Transport in bulk according to Annex MARPOL73/78 and the IBC Code 	Il of Not applicable.
· UN "Model Regulation":	not regulated

15 Regulatory information

• Safety, health and environmental regulations/legislation specific for the substance or mixture No further relevant information available.

· Sara

· Section 355 (extremely hazardous substances):

None of the ingredients is listed.

· Section 313 (Specific toxic chemical listings):

None of the ingredients is listed.

• TSCA (Toxic Substances Control Act):

All components have the value ACTIVE.

· Hazardous Air Pollutants

None of the ingredients is listed.

· Proposition 65

· Chemicals known to cause cancer:

None of the ingredients is listed.

· Chemicals known to cause reproductive toxicity for females:

None of the ingredients is listed.

· Chemicals known to cause reproductive toxicity for males:

None of the ingredients is listed.

· Chemicals known to cause developmental toxicity:

None of the ingredients is listed.

Carcinogenic categories

· EPA (Environmental Protection Agency)

None of the ingredients is listed.

(Contd. on page 9)

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Trade name: TNS Buffer Solution pH 8.0

(Contd. from page 8)

• TLV (Threshold Limit Value)

None of the ingredients is listed.

· NIOSH-Ca (National Institute for Occupational Safety and Health)

None of the ingredients is listed.

• Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

16 Other information

All chemicals may pose unknown hazards and should be used with caution. This SDS applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this SDS. Cayman Chemical Company assumes no responsibility for incidental or consequential damages, including lost profits, arising from the use of these data. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this SDS is based on technical data judged to be reliable, Cayman Chemical Company assumes no responsibility for the completeness or accuracy of the information contained herein.

- · Department issuing SDS: Environment protection department.
- · Contact: -
- Date of preparation / last revision 06/27/2023

 Abbreviations and acronyms: IMDG: International Maritime Code for Dangerous Goods DOT: US Department of Transportation IATA: International Air Transport Association EINECS: European Inventory of Existing Commercial Chemical Substances ELINCS: European List of Notified Chemical Substances CAS: Chemical Abstracts Service (division of the American Chemical Society) NFPA: National Fire Protection Association (USA) HMIS: Hazardous Materials Identification System (USA) VOC: Volatile Organic Compounds (USA, EU) LC50: Lethal concentration, 50 percent LD50: Lethal dose, 50 percent PBT: Persistent, Bioaccumulative and Toxic vPvB: very Persistent and very Bioaccumulative NIOSH: National Institute for Occupational Safety OSHA: Occupational Safety & Health TLV: Threshold Limit Value PEL: Permissible Exposure Limit **REL: Recommended Exposure Limit** Eye Irritation 2A: Serious eye damage/eye irritation - Category 2A Specific Target Organ Toxicity - Repeated Exposure 2: Specific target organ toxicity (repeated exposure) - Category 2



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1 Identification

- · Product identifier
- Trade name: TNS Buffer Solution pH 8.5
- Article number: 400645
- **Application of the substance / the mixture** This product is for research use - Not for human or veterinary diagnostic or therapeutic use.
- · Details of the supplier of the safety data sheet

• **Manufacturer/Supplier:** Cayman Chemical Co. 1180 E. Ellsworth Rd. Ann Arbor, MI 48108 USA

 Information department: Product safety department
 Emergency telephone number: During normal opening times: +1 (734) 971-3335 US/CANADA: 800-424-9300 Outside US/CANADA: 703-741-5970

2 Hazard(s) identification

 Classification of the substance or mixture 	
GHS08 Health hazard	
Specific Target Organ Toxicity - Repeated Exposure H373 May cause damage to organ 2 prolonged or repeated exposure	
GHS07	
Eye Irritation 2A H319 Causes serious eye irritation.	
 Label elements GHS label elements The product is classified and labeled according to the Globally Harmonized System (GHS). (Co 	ontd. on page 2)

Printing date 06/27/2023

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rade name: TNS Buffer	Solution pH 8.5	
		(Contd. from page
 Hazard pictograms 		
GHS07 GHS08		
· Signal word Warning	J	
· Hazard-determining	components of labeling:	
Sodium chloride		
 Hazard statements 		
H319 Causes serious		
	hage to organs through prolonged or	repeated exposure.
Precautionary stater		
	o not breathe dust/fume/gas/mist/vap	oors/spray.
	ash thoroughly after handling.	
	ear eye protection / face protection.	for according to Demonstrate the
		for several minutes. Remove contact lenses
	esent and easy to do. Continue rinsi et medical advice/attention if you fee	
	eye irritation persists: Get medical ad	
		rdance with local/regional/national/internation
	gulations.	
· Classification syster		
• NFPA ratings (scale		
	0	
Health = Fire = 0	2	
20 Reactivit	$h_{i} = 0$	
\checkmark		
• HMIS-ratings (scale	0 - 4)	
HEALTH 2 Health		
FIRE 0 Fire = 0		
REACTIVITY 0 Reactiv	vity = 0	
· Other hazards		
· Results of PBT and	vPvB assessment	
• PBT: Not applicable.		
• vPvB: Not applicable	_	
	·	
3 Composition/info	ormation on ingredients	
· Chemical characteri	zation: Mixtures	
	of the substances listed below with	nonhazardous additions.
· Description: Mixture		
•		
Description: Mixture Dangerous compone CAS: 7647-14-5		8.7649

 Dangerous compone 	ents:	
CAS: 7647-14-5 RTECS: VZ4725000	Sodium chloride	8.764%
CAS: 77-92-9 RTECS: GE7350000	citric acid	3.836%
<u> </u>	(Contd	. on page 3)

87.4%

Safety Data Sheet acc. to OSHA HCS

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Trade name: TNS Buffer Solution pH 8.5

(Contd. from page 2)

· Other ingredients

CAS: 7732-18-5 Water RTECS: ZC0110000

4 First-aid measures

· Description of first aid measures

· General information:

Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.

- After inhalation: Supply fresh air; consult doctor in case of complaints.
- After skin contact: Generally the product does not irritate the skin.
- · After eye contact:
- Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
- · After swallowing: If symptoms persist consult doctor.
- · Information for doctor:
- Most important symptoms and effects, both acute and delayed No further relevant information available.
- Indication of any immediate medical attention and special treatment needed No further relevant information available.

5 Fire-fighting measures

- Extinguishing media
- **Suitable extinguishing agents:** Use fire fighting measures that suit the environment. A solid water stream may be inefficient.
- Special hazards arising from the substance or mixture 67-56-1During heating or in case of fire poisonous gases are produced.
- Advice for firefighters
- · Protective equipment: Mouth respiratory protective device.

6 Accidental release measures

- Personal precautions, protective equipment and emergency procedures Mount respiratory protective device.
- Environmental precautions: Dilute with plenty of water.
- Do not allow to enter sewers/ surface or ground water. Methods and material for containment and cleaning up: Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust). Dispose contaminated material as waste according to section 13.
- Ensure adequate ventilation. • Reference to other sections See Section 7 for information on safe handling. See Section 9 for information on personal proto
- See Section 8 for information on personal protection equipment. See Section 13 for disposal information.
- Protective Action Criteria for Chemicals

· PAC-1:

None of the ingredients is listed.

(Contd. on page 4)

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Trade name: TNS Buffer Solution pH 8.5

(Contd. from page 3)

· PAC-2:

None of the ingredients is listed.

· PAC-3:

None of the ingredients is listed.

7 Handling and storage

- · Handling:
- **Precautions for safe handling** Ensure good ventilation/exhaustion at the workplace. Prevent formation of aerosols.
- Information about protection against explosions and fires: Keep respiratory protective device available.
- · Conditions for safe storage, including any incompatibilities
- Storage: Store in accordance with information listed on the product insert.
- Requirements to be met by storerooms and receptacles: No special requirements.
- Information about storage in one common storage facility: Not required.
- Further information about storage conditions: Keep receptacle tightly sealed.
- Specific end use(s) No further relevant information available.

8 Exposure controls/personal protection

· Additional information about design of technical systems: No further data; see section 7.

- · Control parameters
- **Components with limit values that require monitoring at the workplace:** The product does not contain any relevant quantities of materials with critical values that have to be

The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.

- · Additional information: The lists that were valid during the creation were used as basis.
- · Exposure controls
- · Personal protective equipment:
- General protective and hygienic measures:
- Keep away from foodstuffs, beverages and feed.
- Immediately remove all soiled and contaminated clothing.

Wash hands before breaks and at the end of work.

Store protective clothing separately.

Avoid contact with the eyes.

Avoid contact with the eyes and skin.

· Breathing equipment:

In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.

Protection of hands:



Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation. Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.

(Contd. on page 5)

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Trade name: TNS Buffer Solution pH 8.5

(Contd. from page 4) Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

· Material of gloves

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

• **Penetration time of glove material** The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

• Eye protection:



Tightly sealed goggles

9 Physical and chemical properties

General Information Appearance:	
Form:	Liquid
Color:	According to product specification
Odor:	Characteristic
Odor threshold:	Not determined.
pH-value at 20 °C (68 °F):	8.5
Change in condition	
Melting point/Melting range:	Undetermined.
Boiling point/Boiling range:	100 °C (212 °F)
Flash point:	Not applicable.
Flammability (solid, gaseous):	Not applicable.
Decomposition temperature:	Not determined.
Ignition temperature:	Product is not selfigniting.
Danger of explosion:	Product does not present an explosion hazard.
Explosion limits:	
Lower:	Not determined.
Upper:	Not determined.
Vapor pressure at 20 °C (68 °F):	23 hPa (17.3 mm Hg)
Density:	Not determined.
Relative density	Not determined.
Vapor density	Not determined.
Evaporation rate	Not determined.
Solubility in / Miscibility with	
Water:	Fully miscible.

Printing date 06/27/2023

Revision date 06/27/2023

Trade name: TNS Buffer Solution pH 8.5

	(Contd. fro	om page 5)
 Viscosity: Dynamic: Kinematic: 	Not determined. Not determined.	
 Solvent content: Water: VOC content: 	87.4 % 0.00 % 0.0 g/l / 0.00 lb/gal	
Solids content:	12.6 %	
· Other information	No further relevant information available.	

10 Stability and reactivity

- · Reactivity No further relevant information available.
- · Chemical stability
- Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.
- Possibility of hazardous reactions No dangerous reactions known.
- Conditions to avoid No further relevant information available.
- · Incompatible materials: No further relevant information available.
- Hazardous decomposition products: No dangerous decomposition products known.

11 Toxicological information

· Information on toxicological effects

• Acute toxicity:

7647-14-5 Sodiu	um chloride		
Oral	LDLO	1,000 mg/kg (man)	
	TDLO	650 ml/kg (man)	
	LD50	4,000 mg/kg (mouse)	
		3,000 mg/kg (rat)	
	LD50	4 g/kg (mouse)	
Inhalative	LC50	320 mg/m³ (mouse)	
	TCLO	0.63 mg/m³ (hmn)	
	LCLO	29,300 mg/m³/7h (mouse)	
Irritation of skin	Irritation	500 mg/24h (rabbit) mild	
Irritation of eyes	Irritation	100 mg/24h (rabbit) moderate	
	Intraperitoneal LD50	2,602 mg/kg (mouse)	
	Subcutaneous LD50	31.6 mg/kg (rat)	
	Intravenous LD50	59.5 mg/kg (rat)	
	Data	15 mg/3D (hmn) mild	
	Subcutaneous LD50	3 g/kg (mouse)	

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Trade name: TNS Buffer Solution pH 8.5

		(Contd. from page 6)
77-92-9 citric a	cid	
Oral	LD50	5,040 mg/kg (mouse)
 Additional toxic 	irritant effect. ating effect. lo sensitizing effects l cological informatior	
· Carcinogenic c	ategories	
· IARC (Internation	onal Agency for Rese	earch on Cancer)
None of the ingr	edients is listed.	
· NTP (National 1	Coxicology Program)	
None of the ingr	edients is listed.	
OSHA-Ca (Occ	upational Safety & H	ealth Administration)
None of the ingr	adiants is listed	

12 Ecological information

- · Toxicity
- · Aquatic toxicity: No further relevant information available.
- Persistence and degradability No further relevant information available.
- Behavior in environmental systems:
- · Bioaccumulative potential No further relevant information available.
- Mobility in soil No further relevant information available.
- Additional ecological information:
- · General notes:

Water hazard class 1 (Self-assessment): slightly hazardous for water

Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.

- · Results of PBT and vPvB assessment
- · **PBT:** Not applicable.
- · vPvB: Not applicable.
- · Other adverse effects No further relevant information available.

13 Disposal considerations

- · Waste treatment methods
- · Recommendation:

Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

- · Uncleaned packagings:
- Recommendation: Disposal must be made according to official regulations.
- · Recommended cleansing agent: Water, if necessary with cleansing agents.

(Contd. on page 8)

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Trade name: TNS Buffer Solution pH 8.5

(Contd. from page 7)

4 Transport information		
· UN-Number · DOT, IMDG, IATA	not regulated	
 UN proper shipping name DOT, IMDG, IATA 	not regulated	
· Transport hazard class(es)		
· DOT, ADN, IMDG, IATA · Class	not regulated	
 Packing group DOT, IMDG, IATA 	not regulated	
· Environmental hazards:	Not applicable.	
· Special precautions for user	Not applicable.	
 Transport in bulk according to Annex MARPOL73/78 and the IBC Code 	t II of Not applicable.	
· UN "Model Regulation":	not regulated	

15 Regulatory information

• Safety, health and environmental regulations/legislation specific for the substance or mixture No further relevant information available.

· Sara

· Section 355 (extremely hazardous substances):

None of the ingredients is listed.

· Section 313 (Specific toxic chemical listings):

None of the ingredients is listed.

• TSCA (Toxic Substances Control Act):

All components have the value ACTIVE.

· Hazardous Air Pollutants

None of the ingredients is listed.

· Proposition 65

· Chemicals known to cause cancer:

None of the ingredients is listed.

· Chemicals known to cause reproductive toxicity for females:

None of the ingredients is listed.

· Chemicals known to cause reproductive toxicity for males:

None of the ingredients is listed.

· Chemicals known to cause developmental toxicity:

None of the ingredients is listed.

Carcinogenic categories

· EPA (Environmental Protection Agency)

None of the ingredients is listed.

(Contd. on page 9)

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Trade name: TNS Buffer Solution pH 8.5

(Contd. from page 8)

• TLV (Threshold Limit Value)

None of the ingredients is listed.

· NIOSH-Ca (National Institute for Occupational Safety and Health)

None of the ingredients is listed.

• Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

16 Other information

All chemicals may pose unknown hazards and should be used with caution. This SDS applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this SDS. Cayman Chemical Company assumes no responsibility for incidental or consequential damages, including lost profits, arising from the use of these data. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this SDS is based on technical data judged to be reliable, Cayman Chemical Company assumes no responsibility for the completeness or accuracy of the information contained herein.

- · Department issuing SDS: Environment protection department.
- · Contact: -
- Date of preparation / last revision 06/27/2023

 Abbreviations and acronyms: IMDG: International Maritime Code for Dangerous Goods DOT: US Department of Transportation IATA: International Air Transport Association EINECS: European Inventory of Existing Commercial Chemical Substances ELINCS: European List of Notified Chemical Substances CAS: Chemical Abstracts Service (division of the American Chemical Society) NFPA: National Fire Protection Association (USA) HMIS: Hazardous Materials Identification System (USA) VOC: Volatile Organic Compounds (USA, EU) LC50: Lethal concentration, 50 percent LD50: Lethal dose, 50 percent PBT: Persistent, Bioaccumulative and Toxic vPvB: very Persistent and very Bioaccumulative NIOSH: National Institute for Occupational Safety OSHA: Occupational Safety & Health TLV: Threshold Limit Value PEL: Permissible Exposure Limit **REL: Recommended Exposure Limit** Eye Irritation 2A: Serious eye damage/eye irritation - Category 2A Specific Target Organ Toxicity - Repeated Exposure 2: Specific target organ toxicity (repeated exposure) - Category 2



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1 Identification

- · Product identifier
- Trade name: 10X TNS Buffer Solution pH 9.0
- Article number: 400646
- **Application of the substance / the mixture** This product is for research use - Not for human or veterinary diagnostic or therapeutic use.
- · Details of the supplier of the safety data sheet

• **Manufacturer/Supplier:** Cayman Chemical Co. 1180 E. Ellsworth Rd. Ann Arbor, MI 48108 USA

 Information department: Product safety department
 Emergency telephone number: During normal opening times: +1 (734) 971-3335 US/CANADA: 800-424-9300 Outside US/CANADA: 703-741-5970

2 Hazard(s) identification

• Classification of the substance o	or mixture
GHS08 Health hazard	
Specific Target Organ Toxicity - Re 2	peated Exposure H373 May cause damage to organs through prolonged or repeated exposure.
GHS07	
Eye Irritation 2A	H319 Causes serious eye irritation.
 Label elements GHS label elements The product is classified and labele 	ed according to the Globally Harmonized System (GHS). (Contd. on page 2)
	03

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Revision date 06/27/2023

Trade name: 10X TNS Buffer Solution pH 9.0

(Contd. from	page 1)
· Hazard pictograms	
GHS07 GHS08	
· Signal word Warning	
· Hazard-determining components of labeling:	
Sodium chloride · Hazard statements	
H319 Causes serious eye irritation.	
H373 May cause damage to organs through prolonged or repeated exposure.	
Precautionary statements	
P260 Do not breathe dust/fume/gas/mist/vapors/spray.	
P264 Wash thoroughly after handling. P280 Wear eye protection / face protection.	
P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact len	ses if
present and easy to do. Continue rinsing.	565, II
P314 Get medical advice/attention if you feel unwell.	
P337+P313 If eye irritation persists: Get medical advice/attention.	
P501 Dispose of contents/container in accordance with local/regional/national/interna regulations.	ational
· Classification system:	
· NFPA ratings (scale 0 - 4)	
Health = 2	
Fire = 0	
2 Reactivity = 0	
· HMIS-ratings (scale 0 - 4)	
HEALTH 2 Health = 2	
FIRE 0 Fire = 0	
REACTIVITY 0 Reactivity = 0	
· Other hazards	
Results of PBT and vPvB assessment	
 PBT: Not applicable. vPvB: Not applicable. 	
3 Composition/information on ingredients	

· Chemical characterization: Mixtures

· **Description:** Mixture of the substances listed below with nonhazardous additions.

 Dangerous component 	ents:	
CAS: 7647-14-5 RTECS: VZ4725000	Sodium chloride	8.764%
CAS: 77-92-9 RTECS: GE7350000	citric acid	3.836%
		(Contd. on page 3)

87.4%

Safety Data Sheet acc. to OSHA HCS

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Trade name: 10X TNS Buffer Solution pH 9.0

(Contd. from page 2)

· Other ingredients

CAS: 7732-18-5 Water RTECS: ZC0110000

4 First-aid measures

· Description of first aid measures

• General information:

Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.

- After inhalation: Supply fresh air; consult doctor in case of complaints.
- After skin contact: Generally the product does not irritate the skin.
- After eye contact:
- Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
- · After swallowing: If symptoms persist consult doctor.
- · Information for doctor:
- Most important symptoms and effects, both acute and delayed No further relevant information available.
- Indication of any immediate medical attention and special treatment needed No further relevant information available.

5 Fire-fighting measures

- Extinguishing media
- **Suitable extinguishing agents:** Use fire fighting measures that suit the environment. A solid water stream may be inefficient.
- Special hazards arising from the substance or mixture 67-56-1During heating or in case of fire poisonous gases are produced.
- Advice for firefighters
- · Protective equipment: Mouth respiratory protective device.

6 Accidental release measures

- Personal precautions, protective equipment and emergency procedures Mount respiratory protective device.
- Environmental precautions: Dilute with plenty of water. Do not allow to enter sewers/ surface or ground water.
- Methods and material for containment and cleaning up: Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust). Dispose contaminated material as waste according to section 13. Ensure adequate ventilation.
- Reference to other sections
 See Section 7 for information on safe handling.
 See Section 8 for information on personal protection equipment.
 See Section 13 for disposal information.
- Protective Action Criteria for Chemicals

· PAC-1:

None of the ingredients is listed.

(Contd. on page 4)

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Trade name: 10X TNS Buffer Solution pH 9.0

(Contd. from page 3)

· PAC-2:

None of the ingredients is listed.

· PAC-3:

None of the ingredients is listed.

7 Handling and storage

- · Handling:
- **Precautions for safe handling** Ensure good ventilation/exhaustion at the workplace. Prevent formation of aerosols.
- Information about protection against explosions and fires: Keep respiratory protective device available.
- · Conditions for safe storage, including any incompatibilities
- Storage: Store in accordance with information listed on the product insert.
- Requirements to be met by storerooms and receptacles: No special requirements.
- Information about storage in one common storage facility: Not required.
- Further information about storage conditions: Keep receptacle tightly sealed.
- Specific end use(s) No further relevant information available.

8 Exposure controls/personal protection

· Additional information about design of technical systems: No further data; see section 7.

- · Control parameters
- Components with limit values that require monitoring at the workplace: The product does not contain any relevant quantities of materials with critical values that have to be
- monitored at the workplace.
- · Additional information: The lists that were valid during the creation were used as basis.
- · Exposure controls
- Personal protective equipment:
- General protective and hygienic measures:
- Keep away from foodstuffs, beverages and feed.
- Immediately remove all soiled and contaminated clothing.
- Wash hands before breaks and at the end of work.
- Store protective clothing separately.
- Avoid contact with the eyes.

Avoid contact with the eyes and skin.

Breathing equipment:

In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.

Protection of hands:



Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation. Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.

(Contd. on page 5)

[–] US

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Revision date 06/27/2023

Trade name: 10X TNS Buffer Solution pH 9.0

(Contd. from page 4) Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

· Material of gloves

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

Penetration time of glove material The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

• Eye protection:



Tightly sealed goggles

9 Physical and chemical properties

Appearance:	
Form:	Liquid
Color:	According to product specification
Odor:	Characteristic
Odor threshold:	Not determined.
pH-value at 20 °C (68 °F):	9
Change in condition	
Melting point/Melting range:	Undetermined.
Boiling point/Boiling range:	100 °C (212 °F)
Flash point:	Not applicable.
Flammability (solid, gaseous):	Not applicable.
Decomposition temperature:	Not determined.
Ignition temperature:	Product is not selfigniting.
Danger of explosion:	Product does not present an explosion hazard.
Explosion limits:	
Lower:	Not determined.
Upper:	Not determined.
Vapor pressure at 20 °C (68 °F):	23 hPa (17.3 mm Hg)
Density:	Not determined.
Relative density	Not determined.
Vapor density	Not determined.
Evaporation rate	Not determined.
Solubility in / Miscibility with	
Water:	Fully miscible.

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Trade name: 10X TNS Buffer Solution pH 9.0

	(Contd. fro	om page 5)
 Viscosity: Dynamic: Kinematic: 	Not determined. Not determined.	
 Solvent content: Water: VOC content: 	87.4 % 0.00 % 0.0 g/l / 0.00 lb/gal	
Solids content:	12.6 %	
· Other information	No further relevant information available.	

10 Stability and reactivity

- · Reactivity No further relevant information available.
- · Chemical stability
- Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.
- Possibility of hazardous reactions No dangerous reactions known.
- Conditions to avoid No further relevant information available.
- · Incompatible materials: No further relevant information available.
- Hazardous decomposition products: No dangerous decomposition products known.

11 Toxicological information

· Information on toxicological effects

• Acute toxicity:

7647-14-5 Sodiu	um chloride		
Oral	LDLO	1,000 mg/kg (man)	
	TDLO	650 ml/kg (man)	
	LD50	4,000 mg/kg (mouse)	
		3,000 mg/kg (rat)	
	LD50	4 g/kg (mouse)	
Inhalative	LC50	320 mg/m³ (mouse)	
	TCLO	0.63 mg/m³ (hmn)	
	LCLO	29,300 mg/m³/7h (mouse)	
Irritation of skin	Irritation	500 mg/24h (rabbit) mild	
Irritation of eyes	Irritation	100 mg/24h (rabbit) moderate	
	Intraperitoneal LD50	2,602 mg/kg (mouse)	
	Subcutaneous LD50	31.6 mg/kg (rat)	
	Intravenous LD50	59.5 mg/kg (rat)	
	Data	15 mg/3D (hmn) mild	
	Subcutaneous LD50	3 g/kg (mouse)	

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Trade name: 10X TNS Buffer Solution pH 9.0

77-92-9 citric acid Oral LD50 5,040 mg/kg (mouse) Primary irritant effect: on the skin: No irritant effect. on the skin: No irritant effect. sensitization: No sensitizing effects known. Additional toxicological information: The product shows the following dangers according to internally approved calculation methods for preparations: Irritant Carcinogenic categories Irritant IARC (International Agency for Research on Cancer) None of the ingredients is listed. Image: None of the ingredients is listed. OSHA-Ca (Occupational Safety & Health Administration)			
Oral LD50 5,040 mg/kg (mouse) • Primary irritant effect: • on the skin: No irritant effect. • on the skin: No irritant effect. • Sensitization: No sensitizing effects known. • Additional toxicological information: The product shows the following dangers according to internally approved calculation methods for preparations: Irritant • Carcinogenic categories • IARC (International Agency for Research on Cancer) None of the ingredients is listed. • NTP (National Toxicology Program) None of the ingredients is listed. • OSHA-Ca (Occupational Safety & Health Administration)			(Contd. from page 6)
 Primary irritant effect: on the skin: No irritant effect. on the eye: Irritating effect. Sensitization: No sensitizing effects known. Additional toxicological information: 	77-92-9 citric ac	id	
 on the skin: No irritant effect. on the eye: Irritating effect. Sensitization: No sensitizing effects known. Additional toxicological information: The product shows the following dangers according to internally approved calculation methods for preparations: Irritant Carcinogenic categories IARC (International Agency for Research on Cancer) None of the ingredients is listed. NTP (National Toxicology Program) None of the ingredients is listed. OSHA-Ca (Occupational Safety & Health Administration) 	Oral	LD50	5,040 mg/kg (mouse)
 on the skin: No irritant effect. on the eye: Irritating effect. Sensitization: No sensitizing effects known. Additional toxicological information: The product shows the following dangers according to internally approved calculation methods for preparations: Irritant Carcinogenic categories IARC (International Agency for Research on Cancer) None of the ingredients is listed. NTP (National Toxicology Program)	· Primary irritant	effect:	·
 Sensitization: No sensitizing effects known. Additional toxicological information: The product shows the following dangers according to internally approved calculation methods for preparations: Irritant Carcinogenic categories IARC (International Agency for Research on Cancer) None of the ingredients is listed. NTP (National Toxicology Program) None of the ingredients is listed. OSHA-Ca (Occupational Safety & Health Administration) 	-		
 Additional toxicological information: The product shows the following dangers according to internally approved calculation methods for preparations: Irritant Carcinogenic categories IARC (International Agency for Research on Cancer) None of the ingredients is listed. NTP (National Toxicology Program) None of the ingredients is listed. OSHA-Ca (Occupational Safety & Health Administration) 	• on the eye: Irrita	iting effect.	
 Additional toxicological information: The product shows the following dangers according to internally approved calculation methods for preparations: Irritant Carcinogenic categories IARC (International Agency for Research on Cancer) None of the ingredients is listed. NTP (National Toxicology Program) None of the ingredients is listed. OSHA-Ca (Occupational Safety & Health Administration) 	Sensitization: N	lo sensitizing effects k	(nown.
preparations: Irritant • Carcinogenic categories • IARC (International Agency for Research on Cancer) None of the ingredients is listed. • NTP (National Toxicology Program) None of the ingredients is listed. • OSHA-Ca (Occupational Safety & Health Administration)			
Irritant • Carcinogenic categories • IARC (International Agency for Research on Cancer) None of the ingredients is listed. • NTP (National Toxicology Program) None of the ingredients is listed. • OSHA-Ca (Occupational Safety & Health Administration)	The product sho	ows the following dar	ngers according to internally approved calculation methods for
Carcinogenic categories IARC (International Agency for Research on Cancer) None of the ingredients is listed. NTP (National Toxicology Program) None of the ingredients is listed. OSHA-Ca (Occupational Safety & Health Administration)	preparations:		
· IARC (International Agency for Research on Cancer) None of the ingredients is listed. · NTP (National Toxicology Program) None of the ingredients is listed. · OSHA-Ca (Occupational Safety & Health Administration)	Irritant		
None of the ingredients is listed. • NTP (National Toxicology Program) None of the ingredients is listed. • OSHA-Ca (Occupational Safety & Health Administration)	 Carcinogenic ca 	ategories	
· NTP (National Toxicology Program) None of the ingredients is listed. · OSHA-Ca (Occupational Safety & Health Administration)	· IARC (Internatio	onal Agency for Rese	earch on Cancer)
None of the ingredients is listed. • OSHA-Ca (Occupational Safety & Health Administration)	None of the ingre	edients is listed.	
· OSHA-Ca (Occupational Safety & Health Administration)	· NTP (National T	oxicology Program)	
	None of the ingre	None of the ingredients is listed.	
None of the ingrediente is listed	· OSHA-Ca (Occu	pational Safety & He	ealth Administration)
None of the ingredients is listed.	None of the ingre	edients is listed.	

12 Ecological information

- · Toxicity
- · Aquatic toxicity: No further relevant information available.
- Persistence and degradability No further relevant information available.
- Behavior in environmental systems:
- · **Bioaccumulative potential** No further relevant information available.
- Mobility in soil No further relevant information available.
- Additional ecological information:
- · General notes:

Water hazard class 1 (Self-assessment): slightly hazardous for water

Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.

- · Results of PBT and vPvB assessment
- · PBT: Not applicable.
- · vPvB: Not applicable.
- Other adverse effects No further relevant information available.

13 Disposal considerations

- · Waste treatment methods
- · Recommendation:

Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

- · Uncleaned packagings:
- Recommendation: Disposal must be made according to official regulations.
- · Recommended cleansing agent: Water, if necessary with cleansing agents.

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4 Transport information	
· UN-Number · DOT, IMDG, IATA	not regulated
 UN proper shipping name DOT, IMDG, IATA 	not regulated
· Transport hazard class(es)	
[·] DOT, ADN, IMDG, IATA [·] Class	not regulated
 Packing group DOT, IMDG, IATA 	not regulated
· Environmental hazards:	Not applicable.
· Special precautions for user	Not applicable.
 Transport in bulk according to Annex MARPOL73/78 and the IBC Code 	k II of Not applicable.
· UN "Model Regulation":	not regulated

15 Regulatory information

• Safety, health and environmental regulations/legislation specific for the substance or mixture No further relevant information available.

· Sara

· Section 355 (extremely hazardous substances):

None of the ingredients is listed.

· Section 313 (Specific toxic chemical listings):

None of the ingredients is listed.

• TSCA (Toxic Substances Control Act):

All components have the value ACTIVE.

· Hazardous Air Pollutants

None of the ingredients is listed.

· Proposition 65

· Chemicals known to cause cancer:

None of the ingredients is listed.

· Chemicals known to cause reproductive toxicity for females:

None of the ingredients is listed.

· Chemicals known to cause reproductive toxicity for males:

None of the ingredients is listed.

· Chemicals known to cause developmental toxicity:

None of the ingredients is listed.

Carcinogenic categories

· EPA (Environmental Protection Agency)

None of the ingredients is listed.

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• TLV (Threshold Limit Value)

None of the ingredients is listed.

· NIOSH-Ca (National Institute for Occupational Safety and Health)

None of the ingredients is listed.

· Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

16 Other information

All chemicals may pose unknown hazards and should be used with caution. This SDS applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this SDS. Cayman Chemical Company assumes no responsibility for incidental or consequential damages, including lost profits, arising from the use of these data. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this SDS is based on technical data judged to be reliable, Cayman Chemical Company assumes no responsibility for the completeness or accuracy of the information contained herein.

- · Department issuing SDS: Environment protection department.
- · Contact: -
- Date of preparation / last revision 06/27/2023

 Abbreviations and acronyms: IMDG: International Maritime Code for Dangerous Goods DOT: US Department of Transportation IATA: International Air Transport Association EINECS: European Inventory of Existing Commercial Chemical Substances ELINCS: European List of Notified Chemical Substances CAS: Chemical Abstracts Service (division of the American Chemical Society) NFPA: National Fire Protection Association (USA) HMIS: Hazardous Materials Identification System (USA) VOC: Volatile Organic Compounds (USA, EU) LC50: Lethal concentration, 50 percent LD50: Lethal dose, 50 percent PBT: Persistent, Bioaccumulative and Toxic vPvB: very Persistent and very Bioaccumulative NIOSH: National Institute for Occupational Safety OSHA: Occupational Safety & Health TLV: Threshold Limit Value PEL: Permissible Exposure Limit **REL: Recommended Exposure Limit** Eye Irritation 2A: Serious eye damage/eye irritation - Category 2A Specific Target Organ Toxicity - Repeated Exposure 2: Specific target organ toxicity (repeated exposure) - Category 2