

SAFETY DATA SHEET

according to the (US) Hazard Communication Standard (29 CFR 1910.1200)

Revision Date 09/26/2018

Version 2.1

SECTION 1. Identification**Product identifier**

Product number	109162
Product name	Tetra-n-butylammonium hydroxide solution in 2-propanol/methanol for titrations in nonaqueous media $c[(C_4H_9)_4NOH] = 0.1 \text{ mol/l}$ (0.1 N) Titripur® Reag. Ph Eur, Reag. USP

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

Identified uses	Reagent for analysis
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Details of the supplier of the safety data sheet

Company	EMD Millipore Corporation 400 Summit Drive Burlington Massachusetts 01803 United States of America General Inquiries: +1 800-645-5476 Monday to Friday, 9:00 AM to 4:00 PM Eastern Time (GMT-5) MilliporeSigma is a business of Merck KGaA, Darmstadt, Germany.
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Emergency telephone	800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week
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SECTION 2. Hazards identification**GHS Classification**

Flammable liquid, Category 2, H225
Acute toxicity, Category 4, Oral, H302
Acute toxicity, Category 4, Inhalation, H332
Acute toxicity, Category 4, Dermal, H312
Skin irritation, Category 2, H315
Serious eye damage, Category 1, H318
Specific target organ systemic toxicity - single exposure, Category 1, Eyes, H370
Specific target organ systemic toxicity - single exposure, Category 3, Central nervous system, H336
For the full text of the H-Statements mentioned in this Section, see Section 16.

GHS-Labeling*Hazard pictograms**Signal Word*

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Danger

Hazard Statements

H225 Highly flammable liquid and vapor.
H302 + H312 + H332 Harmful if swallowed, in contact with skin or if inhaled.
H315 Causes skin irritation.
H318 Causes serious eye damage.
H336 May cause drowsiness or dizziness.
H370 Causes damage to organs (Eyes).

Precautionary Statements

P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P233 Keep container tightly closed.
P240 Ground/bond container and receiving equipment.
P241 Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242 Use only non-sparking tools.
P243 Take precautionary measures against static discharge.
P260 Do not breathe dust/ fume/ gas/ mist/ vapors/ spray.
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P271 Use only outdoors or in a well-ventilated area.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P312 IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell.
P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304 + P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310 Immediately call a POISON CENTER/doctor.
P322 Specific measures (see supplemental first aid instructions on this label).
P330 Rinse mouth.
P332 + P313 If skin irritation occurs: Get medical advice/ attention.
P362 Take off contaminated clothing and wash before reuse.
P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
P403 + P235 Store in a well-ventilated place. Keep cool.
P405 Store locked up.
P501 Dispose of contents/ container to an approved waste disposal plant.

Other hazards

None known.

SECTION 3. Composition/information on ingredients

Chemical nature Mixture of organic compounds

Hazardous ingredients

Chemical name (Concentration)
CAS-No.

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2-Propanol ($\geq 70 \% - < 90 \%$)

67-63-0

Exact percentages are being withheld as a trade secret.

methanol ($\geq 10 \% - < 30 \%$)

67-56-1

Exact percentages are being withheld as a trade secret.

Tetrabutylammonium hydroxide ($\geq 1 \% - < 5 \%$)

2052-49-5

Exact percentages are being withheld as a trade secret.

SECTION 4. First aid measures

Description of first-aid measures

Inhalation

After inhalation: fresh air. Immediately call in physician. If breathing stops: immediately apply artificial respiration, if necessary also oxygen.

Skin contact

In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/shower. Call a physician immediately.

Eye contact

After eye contact: rinse out with plenty of water. Immediately call in ophthalmologist. Remove contact lenses.

Ingestion

After swallowing: caution if victim vomits. Risk of aspiration! Keep airways free. Pulmonary failure possible after aspiration of vomit. Do not attempt to neutralize.

Never give anything by mouth to an unconscious person.

Most important symptoms and effects, both acute and delayed

Risk of serious damage to eyes.

Irritation and corrosion, somnolence, Drowsiness, Dermatitis, Dizziness, narcosis, agitation, spasms, inebriation, Nausea, Vomiting, Headache, Impairment of vision, respiratory paralysis, Unconsciousness, Coma

Drying-out effect resulting in rough and chapped skin.

Indication of any immediate medical attention and special treatment needed

No information available.

SECTION 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media

Foam, Carbon dioxide (CO₂), Dry powder, Water

Unsuitable extinguishing media

For this substance/mixture no limitations of extinguishing agents are given.

Special hazards arising from the substance or mixture

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Combustible.
Pay attention to flashback.
Vapors are heavier than air and may spread along floors.
Forms explosive mixtures with air at ambient temperatures.
Development of hazardous combustion gases or vapors possible in the event of fire.

Advice for firefighters

Special protective equipment for fire-fighters

Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

Further information

Remove container from danger zone and cool with water. Suppress (knock down) gases/vapors/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Advice for non-emergency personnel: Do not breathe vapors, aerosols. Avoid substance contact. Ensure adequate ventilation. Keep away from heat and sources of ignition. Evacuate the danger area, observe emergency procedures, consult an expert.

Advice for emergency responders:

Protective equipment see section 8.

Environmental precautions

Do not let product enter drains. Risk of explosion.

Methods and materials for containment and cleaning up

Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up carefully with liquid-absorbent material (e.g. Chemizorb®). Dispose of properly. Clean up affected area.

SECTION 7. Handling and storage

Precautions for safe handling

Observe label precautions.

Work under hood. Do not inhale substance/mixture. Avoid generation of vapors/aerosols.

Advice on protection against fire and explosion

Keep away from open flames, hot surfaces and sources of ignition. Take precautionary measures against static discharge.

Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place. Keep away from heat and sources of ignition.

Storage temperature: no restrictions.

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SECTION 8. Exposure controls/personal protection

Exposure limit(s)

Ingredients

Basis	Value	Threshold limits	Remarks
<i>2-Propanol 67-63-0</i>			
ACGIH	Time Weighted Average (TWA):	200 ppm	
	Short Term Exposure Limit (STEL):	400 ppm	
NIOSH/GUIDE	Recommended exposure limit (REL):	400 ppm 980 mg/m ³	
	Short Term Exposure Limit (STEL):	500 ppm 1,225 mg/m ³	
OSHA_TRANS	PEL:	400 ppm 980 mg/m ³	
Z1A	Short Term Exposure Limit (STEL):	500 ppm 1,225 mg/m ³	
	Time Weighted Average (TWA):	400 ppm 980 mg/m ³	
<i>methanol 67-56-1</i>			
ACGIH	Time Weighted Average (TWA):	200 ppm	
	Short Term Exposure Limit (STEL):	250 ppm	
	Skin designation:		Can be absorbed through the skin.
NIOSH/GUIDE	Recommended exposure limit (REL):	200 ppm 260 mg/m ³	
	Skin designation:		Can be absorbed through the skin.
	Short Term Exposure Limit (STEL):	250 ppm 325 mg/m ³	
OSHA_TRANS	PEL:	200 ppm 260 mg/m ³	
Z1A	Time Weighted Average (TWA):	200 ppm 260 mg/m ³	
	Skin designation (Final Rule Limit applies):		Can be absorbed through the skin.
	Short Term Exposure Limit (STEL):	250 ppm 325 mg/m ³	

Engineering measures

Technical measures and appropriate working operations should be given priority over the use of personal protective equipment.

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Individual protection measures

Protective clothing should be selected specifically for the workplace, depending on concentration and quantity of the hazardous substances handled. The chemical resistance of the protective equipment should be inquired at the respective supplier.

Hygiene measures

Immediately change contaminated clothing. Apply skin- protective barrier cream. Wash hands and face after working with substance.

Eye/face protection

Tightly fitting safety goggles

Hand protection

full contact:

Glove material:	butyl-rubber
Glove thickness:	0.7 mm
Break through time:	480 min

splash contact:

Glove material:	Viton (R)
Glove thickness:	0.70 mm
Break through time:	120 min

The protective gloves to be used must comply with the specifications of EC Directive 89/686/EEC and the related standard EN374, for example KCL 898 Butoject® (full contact), KCL 890 Vitoject® (splash contact).

This recommendation applies only to the product stated in the safety data sheet and supplied by us as well as to the purpose specified by us. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).

Other protective equipment:

Flame retardant antistatic protective clothing.

Respiratory protection

required when vapors/aerosols are generated.

Recommended Filter type: Filter AX (EN 371)

The entrepreneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are performed according to the instructions of the producer. These measures have to be properly documented.

SECTION 9. Physical and chemical properties

Physical state	liquid
Color	colorless
Odor	characteristic
Odor Threshold	No information available.

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pH	ca. 14 at 68 °F (20 °C)
Melting point	No information available.
Boiling point	No information available.
Flash point	54 °F (12 °C)
Evaporation rate	No information available.
Flammability (solid, gas)	No information available.
Lower explosion limit	No information available.
Upper explosion limit	No information available.
Vapor pressure	No information available.
Relative vapor density	No information available.
Density	0.792 g/cm ³ at 68 °F (20 °C)
Relative density	No information available.
Water solubility	at 68 °F (20 °C) soluble
Partition coefficient: n-octanol/water	No information available.
Autoignition temperature	No information available.
Decomposition temperature	No information available.
Viscosity, dynamic	No information available.
Explosive properties	Not classified as explosive.
Oxidizing properties	none

SECTION 10. Stability and reactivity

Reactivity

Vapors may form explosive mixture with air.

Chemical stability

The product is chemically stable under standard ambient conditions (room temperature) .

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Possibility of hazardous reactions

Risk of explosion with:

chlorates, Phosgene, organic nitro compounds, hydrogen peroxide, nitrogen oxides, perchlorates, perchloric acid, salts of oxyhalogenic acids, chromium(VI) oxide, oxyhalogenic compounds, nonmetallic oxides, chromosulfuric acid, hydrides, zinc diethyl, halogens, magnesium, Nitric acid

Risk of ignition or formation of inflammable gases or vapors with:

Alkali metals, Alkaline earth metals

Exothermic reaction with:

Nitric acid, Aldehydes, Amines, fuming sulfuric acid, Iron, Aluminum, Chlorine, PHOSPHORUS TRICHLORIDE, Strong acids, Acid anhydrides, Reducing agents, acid halides

Conditions to avoid

Warming.

Incompatible materials

various plastics, various alloys, zinc alloys, magnesium, rubber, oils

Hazardous decomposition products

in the event of fire: See section 5.

SECTION 11. Toxicological information

Information on toxicological effects

Likely route of exposure

Eye contact, Skin contact

Target Organs

Eyes

Skin

Respiratory system

Central nervous system

gastrointestinal tract

Acute oral toxicity

Acute toxicity estimate: 447.27 mg/kg

Calculation method

Symptoms: Irritations of mucous membranes in the mouth, pharynx, oesophagus and gastrointestinal tract.

Nausea, Vomiting, Risk of aspiration upon vomiting., Pulmonary failure possible after aspiration of vomit.

Acute inhalation toxicity

Acute toxicity estimate: 13.4 mg/l; 4 h ; vapor

Calculation method

Symptoms: Possible symptoms:, mucosal irritations

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Acute dermal toxicity

Acute toxicity estimate : 1,341 mg/kg

Calculation method

Skin irritation

Drying-out effect resulting in rough and chapped skin.

Mixture causes skin irritation.

Eye irritation

Mixture causes serious eye damage.

Specific target organ systemic toxicity - single exposure

Causes damage to organs.

Target Organs: Eyes

May cause drowsiness or dizziness.

Target Organs: Central nervous system

Specific target organ systemic toxicity - repeated exposure

The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Aspiration hazard

Regarding the available data the classification criteria are not fulfilled.

Carcinogenicity

IARC

No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

OSHA

No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

NTP

No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

ACGIH

No ingredient of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

Further information

After absorption:

acidosis, drop in blood pressure, agitation, spasms, narcosis, respiratory paralysis, Coma

Systemic effects:

Headache, Dizziness, inebriation, Impairment of vision, blindness

Symptoms may be delayed.

Damage to:

Liver, Kidney, Cardiac, Irreversible damage of the optical nerve.

Other dangerous properties can not be excluded.

Handle in accordance with good industrial hygiene and safety practice.

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Ingredients

2-Propanol

Acute oral toxicity

LD50 Rat: 5,045 mg/kg (RTECS)

Acute inhalation toxicity

LC50 Rat: 37.5 mg/l; 4 h ; vapor

OECD Test Guideline 403

Acute dermal toxicity

LD50 Rabbit: 12,800 mg/kg (RTECS)

Skin irritation

Rabbit

Result: No skin irritation

OECD Test Guideline 404

Eye irritation

Rabbit

Result: Eye irritation

OECD Test Guideline 405

Sensitization

Buehler Test Guinea pig

Result: negative

Method: OECD Test Guideline 406

Germ cell mutagenicity

Genotoxicity in vivo

In vivo micronucleus test

Mouse

Result: negative

Method: OECD Test Guideline 474

Genotoxicity in vitro

Ames test

Salmonella typhimurium

Result: negative

Method: OECD Test Guideline 471

In vitro mammalian cell gene mutation test

Result: negative

Method: OECD Test Guideline 476

Carcinogenicity

Method: OECD Test Guideline 451

Did not show carcinogenic effects in animal experiments.

Reproductive toxicity

No impairment of reproductive performance in animal experiments. (IUCLID)

Teratogenicity

Did not show teratogenic effects in animal experiments. (IUCLID)

methanol

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Acute oral toxicity

LDLO human: 143 mg/kg (RTECS)

Acute toxicity estimate: 100.1 mg/kg

Expert judgment

Acute inhalation toxicity

LC50 Rat: 131.25 mg/l; 4 h ; vapor (ECHA)

Acute dermal toxicity

LD50 Rabbit: ca. 17,100 mg/kg (External MSDS)

Acute toxicity estimate : 300.1 mg/kg

Expert judgment

Skin irritation

Rabbit

Result: No skin irritation

(ECHA)

Eye irritation

Rabbit

Result: No eye irritation

(ECHA)

Sensitization

Sensitization test: Guinea pig

Result: negative

Method: OECD Test Guideline 406

Repeated dose toxicity

Rat

male and female

Inhalation

vapor

28 d

daily

NOAEL: 6.66 mg/l

OECD Test Guideline 412

Subacute toxicity

Rat

male and female

Inhalation

365 d

daily

NOAEL: 0.13 mg/l

LOAEL: 1.3 mg/l

OECD Test Guideline 453

Germ cell mutagenicity

Genotoxicity in vivo

Micronucleus test

Mouse

Result: negative

Method: OECD Test Guideline 474

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Genotoxicity in vitro

Ames test

Salmonella typhimurium

Result: negative

Method: OECD Test Guideline 471

In vitro mammalian cell gene mutation test

Chinese hamster lung cells

Result: negative

Method: OECD Test Guideline 476

Tetrabutylammonium hydroxide

No information available.

SECTION 12. Ecological information

Ecotoxicity

No information available.

Persistence and degradability

No information available.

Bioaccumulative potential

No information available.

Mobility in soil

No information available.

Ingredients

2-Propanol

Toxicity to fish

flow-through test LC50 Pimephales promelas (fathead minnow): 9,640 mg/l; 96 h

US-EPA

Toxicity to daphnia and other aquatic invertebrates

EC50 Daphnia magna (Water flea): 13,299 mg/l; 48 h (IUCLID)

Toxicity to algae

IC50 Desmodesmus subspicatus (green algae): > 1,000 mg/l; 72 h (IUCLID)

Toxicity to bacteria

EC5 Pseudomonas putida: 1,050 mg/l; 16 h (Lit.)

Biodegradability

95 %; 21 d; aerobic

OECD Test Guideline 301E

Readily biodegradable.

Theoretical oxygen demand (ThOD)

2,400 mg/g

(Lit.)

Ratio BOD/ThBOD

BOD5 49 %

(IUCLID)

Ratio COD/ThBOD

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96 %
(Lit.)

Partition coefficient: n-octanol/water
log Pow: 0.05
OECD Test Guideline 107
Bioaccumulation is not expected.

Substance does not meet the criteria for PBT or vPvB according to Regulation (EC) No 1907/2006, Annex XIII.

methanol

Toxicity to fish
flow-through test LC50 *Lepomis macrochirus* (Bluegill sunfish): 15,400 mg/l; 96 h
US-EPA

Toxicity to daphnia and other aquatic invertebrates
static test EC50 *Daphnia magna* (Water flea): > 10,000 mg/l; 48 h
DIN 38412

Toxicity to algae
static test EC50 *Pseudokirchneriella subcapitata* (green algae): ca. 22,000 mg/l; 96 h
OECD Test Guideline 201

Toxicity to bacteria
static test IC50 activated sludge: > 1,000 mg/l; 3 h
Analytical monitoring: yes
OECD Test Guideline 209

Toxicity to fish (Chronic toxicity)
NOEC *Oryzias latipes* (Orange-red killifish): 7,900 mg/l; 200 h
(External MSDS)

Biodegradability
99 %; 30 d
OECD Test Guideline 301D
Readily biodegradable.

Biochemical Oxygen Demand (BOD)
600 - 1,120 mg/g (5 d)
(IUCLID)

Chemical Oxygen Demand (COD)
1,420 mg/g
(IUCLID)

Theoretical oxygen demand (ThOD)
1,500 mg/g
(Lit.)

Ratio BOD/ThBOD
BOD5 76 %
Closed Bottle test

Partition coefficient: n-octanol/water
log Pow: -0.77
(experimental)
(Lit.) Bioaccumulation is not expected.

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Substance does not meet the criteria for PBT or vPvB according to Regulation (EC) No 1907/2006, Annex XIII.

Stability in water

2.2 yr

reaction with hydroxyl radicals (IUCLID)

Tetrabutylammonium hydroxide

No information available.

SECTION 13. Disposal considerations

The information presented only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations. Disposal should be in accordance with applicable regional, national and local laws and regulations.

SECTION 14. Transport information

Land transport (DOT)

UN number	UN 1987
Proper shipping name	ALCOHOLS, N.O.S. (ISOPROPANOL, METHANOL)
Class	3
Packing group	II
Environmentally hazardous	--

Air transport (IATA)

UN number	UN 1987
Proper shipping name	ALCOHOLS, N.O.S. (ISOPROPANOL, METHANOL)
Class	3
Packing group	II
Environmentally hazardous	--
Special precautions for user	no

Sea transport (IMDG)

UN number	UN 1987
Proper shipping name	ALCOHOLS, N.O.S. (ISOPROPANOL, METHANOL)
Class	3
Packing group	II
Environmentally hazardous	--
Special precautions for user	yes
EmS	F-E S-D

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SECTION 15. Regulatory information

United States of America

SARA 313

The following components are subject to reporting levels established by SARA Title III, Section 313:

Ingredients

2-Propanol	67-63-0	74.24 %
methanol	67-56-1	22.38 %

SARA 302

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

Clean Water Act

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

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

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

DEA List I

Not listed

DEA List II

Not listed

US State Regulations

Massachusetts Right To Know

Ingredients

2-Propanol
methanol

Pennsylvania Right To Know

Ingredients

2-Propanol
methanol

New Jersey Right To Know

Ingredients

2-Propanol
methanol

California Prop 65 Components

WARNING: This product contains a chemical known in the State of California to cause birth defects or other reproductive harm.

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Ingredients

methanol

Notification status

TSCA: All components of the product are listed in the TSCA-inventory.

DSL: All components of this product are on the Canadian DSL

SECTION 16. Other information

Training advice

Provide adequate information, instruction and training for operators.

Labeling

Hazard pictograms



Signal Word

Danger

Hazard Statements

H225 Highly flammable liquid and vapor.

H302 + H312 + H332 Harmful if swallowed, in contact with skin or if inhaled.

H315 Causes skin irritation.

H318 Causes serious eye damage.

H336 May cause drowsiness or dizziness.

H370 Causes damage to organs (Eyes).

Precautionary Statements

Prevention

P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.

P240 Ground/bond container and receiving equipment.

P280 Wear eye protection.

Response

P302 + P352 IF ON SKIN: Wash with plenty of soap and water.

P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P308 + P311 IF exposed or concerned: Call a POISON CENTER/doctor.

Storage

P403 + P233 Store in a well-ventilated place. Keep container tightly closed.

SAFETY DATA SHEET

according to the (US) Hazard Communication Standard (29 CFR 1910.1200)

Product number	109162	Version 2.1
Product name	Tetra-n-butylammonium hydroxide solution in 2-propanol/methanol for titrations in nonaqueous media $c[(C_4H_9)_4NOH] = 0.1 \text{ mol/l}$ (0.1 N) Titripur® Reag. Ph Eur, Reag. USP	

Full text of H-Statements referred to under sections 2 and 3.

H225	Highly flammable liquid and vapor.
H302	Harmful if swallowed.
H312	Harmful in contact with skin.
H315	Causes skin irritation.
H318	Causes serious eye damage.
H332	Harmful if inhaled.
H336	May cause drowsiness or dizziness.
H370	Causes damage to organs.

Key or legend to abbreviations and acronyms used in the safety data sheet

Used abbreviations and acronyms can be looked up at www.wikipedia.org.

Revision Date 09/26/2018

The information contained herein is based on the present state of our knowledge. It characterizes the product with regard to appropriate safety precautions. It does not represent a warranty of any product properties and we assume no liability for any loss or injury which may result from the use of this information. Users should conduct their own investigations to determine the suitability of the information.

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