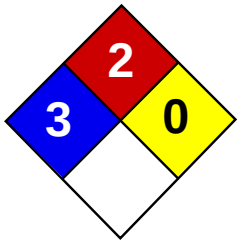

Health	3
Fire	2
Reactivity	0
Personal Protection	H

Material Safety Data Sheet
Acetic acid MSDS

Section 1: Chemical Product and Company Identification

Product Name: Acetic acid

Catalog Codes: SLA3784, SLA1438, SLA2101, SLA3604, SLA1258

CAS#: 64-19-7

RTECS: AF1225000

TSCA: TSCA 8(b) inventory: Acetic acid

CI#: Not applicable.

Synonym: Acetic acid; glacial acetic acid

Chemical Name: Acetic Acid, Glacial

Chemical Formula: C2-H4-O2

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Acetic acid	64-19-7	100

Toxicological Data on Ingredients: Acetic acid: ORAL (LD50): Acute: 3310 mg/kg [Rat]. 4960 mg/kg [Mouse]. 3530 mg/kg [Rat]. DERMAL (LD50): Acute: 1060 mg/kg [Rabbit]. VAPOR (LC50): Acute: 5620 ppm 1 hours [Mouse].

Section 3: Hazards Identification

Potential Acute Health Effects:
Very hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation. Hazardous in case of skin contact (corrosive, permeator), of eye contact (corrosive). Liquid or spray mist may produce tissue damage particularly on mucous membranes of eyes, mouth and respiratory tract. Skin contact may produce burns. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

Potential Chronic Health Effects:
Hazardous in case of skin contact (irritant), of ingestion, of inhalation. CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells. Mutagenic for bacteria and/or yeast. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to kidneys, mucous membranes, skin, teeth. Repeated or prolonged exposure to the substance can produce target organs damage. Repeated

or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact:
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used.Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Flammable.

Auto-Ignition Temperature: 463°C (865.4°F)

Flash Points: CLOSED CUP: 39°C (102.2°F). OPEN CUP: 43°C (109.4°F).

Flammable Limits: LOWER: 4% UPPER: 19.9%

Products of Combustion: These products are carbon oxides (CO, CO2).

Fire Hazards in Presence of Various Substances:
Flammable in presence of open flames and sparks, of heat. Slightly flammable to flammable in presence of oxidizing materials, of metals.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available. Slightly explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions:
Flammable liquid, soluble or dispersed in water. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use alcohol foam, water spray or fog. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion.

Special Remarks on Fire Hazards:
Reacts with metals to produces flammable hydrogen gas. It will ignite on contact with potassium-tert-butoxide. A mixture of ammonium nitrate and acetic acid ignites when warmed, especially if warmed.

Special Remarks on Explosion Hazards:

Acetic acid vapors may form explosive mixtures with air. Reactions between acetic acid and the following materials are potentially explosive: 5-azidotetrazole, bromine pentafluoride, chromium trioxide, hydrogen peroxide, potassium permanganate, sodium peroxide, and phorphorus trichloride. Dilute acetic acid and dilute hydrogen can undergo an exothermic reaction if heated, forming peracetic acid which is explosive at 110 degrees C. Reaction between chlorine trifluoride and acetic acid is very violent, sometimes explosive.

Section 6: Accidental Release Measures

Small Spill:
Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container. If necessary: Neutralize the residue with a dilute solution of sodium carbonate.

Large Spill:
Flammable liquid. Corrosive liquid. Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. If the product is in its solid form: Use a shovel to put the material into a convenient waste disposal container. If the product is in its liquid form: Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Absorb with an inert material and put the spilled material in an appropriate waste disposal. Do not touch spilled material. Use water spray curtain to divert vapor drift. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Neutralize the residue with a dilute solution of sodium carbonate. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
\Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Never add water to this product. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, reducing agents, metals, acids, alkalis.

Storage:
Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame).

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:
Splash goggles. Synthetic apron. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves (impervious).

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 10 STEL: 15 (ppm) [Australia] TWA: 25 STEL: 27 (mg/m3) [Australia] TWA: 10 STEL: 15 (ppm) from NIOSH TWA: 25 STEL: 37 (mg/m3) from NIOSH TWA: 10 STEL: 15 (ppm) [Canada] TWA: 26 STEL: 39 (mg/m3) [Canada] TWA: 25 STEL: 37 (mg/m3) TWA: 10 STEL: 15 (ppm) from ACGIH (TLV) [United States] [1999] TWA: 10 (ppm) from OSHA (PEL) [United States] TWA: 25 (mg/m3) from OSHA (PEL) [United States]Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor: Pungent, vinegar-like, sour (Strong.)

Taste: Vinegar, sour (Strong.)

Molecular Weight: 60.05 g/mole

Color: Colorless. Clear (Light.)

pH (1% soln/water): 2 [Acidic.]

Boiling Point: 118.1°C (244.6°F)

Melting Point: 16.6°C (61.9°F)

Critical Temperature: 321.67°C (611°F)

Specific Gravity: 1.049 (Water = 1)

Vapor Pressure: 1.5 kPa (@ 20°C)

Vapor Density: 2.07 (Air = 1)

Volatility: Not available.

Odor Threshold: 0.48 ppm

Water/Oil Dist. Coeff.: The product is more soluble in water; log(oil/water) = -0.2

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water, diethyl ether, acetone.

Solubility:
Easily soluble in cold water, hot water. Soluble in diethyl ether, acetone. Miscible with Glycerol, alcohol, Benzene, Carbon Tetrachloride. Practically insoluble in Carbon Disulfide.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Heat, ignition sources, incompatible materials

Incompatibility with various substances: Reactive with oxidizing agents, reducing agents, metals, acids, alkalis.

Corrosivity:
Highly corrosive in presence of stainless steel(304). Slightly corrosive in presence of aluminum, of copper. Non-corrosive in presence of stainless steel(316).

Special Remarks on Reactivity:
Reacts violently with strong oxidizing agents, acetaldehyde, and acetic anhydride. Material can react with metals, strong bases, amines, carbonates, hydroxides, phosphates, many oxides,cyanides, sulfides, chromic acid, nitric acid, hydrogen peroxide, carbonates. ammonium nitrate, ammonium thiosulfate, chlorine trifluoride, chlorosulfonic acid, perchloric acid, permanganates, xylene, oleum, potassium hydroxide, sodium hydroxide, phosphorus isocyanate, ethylenediamine, ethylene imine.

Special Remarks on Corrosivity: Moderate corrosive effect on bronze. No corrosion data on brass

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Dermal contact. Eye contact. Inhalation. Ingestion.

Toxicity to Animals:
WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 3310 mg/kg [Rat]. Acute dermal toxicity (LD50): 1060 mg/kg [Rabbit]. Acute toxicity of the vapor (LC50): 5620 1 hours [Mouse].

Chronic Effects on Humans:
MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells. Mutagenic for bacteria and/or yeast. May cause damage to the following organs: kidneys, mucous membranes, skin, teeth.

Other Toxic Effects on Humans:
Extremely hazardous in case of inhalation (lung corrosive). Very hazardous in case of skin contact (irritant), of ingestion, . Hazardous in case of skin contact (corrosive, permeator), of eye contact (corrosive).

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: May affect genetic material and may cause reproductive effects based on animal data. No human data found.

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects: Skin: Extremely irritating and corrosive. Causes skin irritation (reddening and itching, inflammation). May cause blistering , tissue damage and burns. Eyes: Extremely irritating and corrosive. Causes eye irritation, lacrimation, redness, and pain. May cause burns, blurred vision, conjunctivitis, conjunctival and corneal destruction and permanent injury. Inhalation: Causes severe respiratory tract irritation. Affects the sense organs (nose, ear, eye, taste), and blood. May cause chemical pneumonitis, bronchitis, and pulmonary edema. Severe exposure may result in lung tissue damage and corrosion (ulceration) of the mucous membranes. Inhalation may also cause rhinitis, sneezing, coughing, oppressive feeling in the chest or chest pain, dyspnea, wheezing, tachypnea, cyanosis, salivation, nausea, giddiness, muscular weakness. Ingestion: Moderately toxic. Corrosive. Causes gastrointestinal tract irritation (burning and pain of the mouth, throat, and abdomen, coughing, ulceration, bleeding, nausea, abdomial spasms, vomiting, hematemesis, diarrhea. May Also affect the liver (impaired liver function), behavior (convulsions, giddines, muscular weakness), and the urinary system - kidneys (Hematuria, Albuminuria, Nephrosis, acute renal failure, acute tubular necrosis). May also cause dyspnea or asphyxia. May also lead to shock, coma and death. Chronic Potential Health Effects: Chronic exposure via ingestion may cause blackening or erosion of the teeth and jaw necrosis, pharyngitis, and gastritis. It may also behavior (similar to acute ingestion), and metabolism (weight loss). Chronic exposure via inhalation may cause asthma and/or bronchitis with cough, phlegm, and/or shortness of breath . It may also affect the blood (decreased leukocyte count), and urinary system (kidneys). Repeated or prolonged skin contact may cause thickening, blackening, and cracking of the skin.

Section 12: Ecological Information

Ecotoxicity:
Ecotoxicity in water (LC50): 423 mg/l 24 hours [Fish (Goldfish)]. 88 ppm 96 hours [Fish (fathead minnow)]. 75 ppm 96 hours [Fish (bluegill sunfish)]. >100 ppm 96 hours [Daphnia].

BOD5 and COD: BOD-5: 0.34-0.88 g oxygen/g

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification:

CLASS 3: Flammable liquid. Class 8: Corrosive material

Identification: : Acetic Acid, Glacial UNNA: 2789 PG: II

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
New York release reporting list: Acetic acid Rhode Island RTK hazardous substances: Acetic acid Pennsylvania RTK: Acetic acid Florida: Acetic acid Minnesota: Acetic acid Massachusetts RTK: Acetic acid New Jersey: Acetic acid California Director's List of Hazardous Subtances (8 CCR 339): Acetic acid TSCA 8(b) inventory: Acetic acid CERCLA: Hazardous substances.: Acetic acid: 5000 lbs. (2268 kg)

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada):
CLASS B-3: Combustible liquid with a flash point between 37.8°C (100°F) and 93.3°C (200°F). CLASS E: Corrosive liquid.

DSCL (EEC):
R10- Flammable. R35- Causes severe burns. S23- Do not breathe gas/fumes/vapour/spray [***] S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

HMIS (U.S.A.):

Health Hazard: 3

Fire Hazard: 2

Reactivity: 0

Personal Protection: H

National Fire Protection Association (U.S.A.):

Health: 3

Flammability: 2

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves (impervious). Synthetic apron. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/09/2005 03:35 PM

Last Updated: 05/21/2013 12:00 PM

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SAFETY DATA SHEET

Version 4.6

Revision Date 16.04.2013

Print Date 15.09.2013

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product identifiers

Product name : Ethanol

Product Number : 459844
Brand : Sigma-Aldrich

1.2 Other means of identification

Ethyl alcohol

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

Identified uses : Laboratory chemicals, Manufacture of substances

1.4 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Pty. Ltd.
12 Anella Avenue
CASTLE HILL NSW 2154
AUSTRALIA

Telephone : +61 2 9841 0555 (1800 800 097)
Fax : +61 2 9841 0500 (1800 800 096)

1.5 Emergency telephone number

Emergency Phone # : +44 (0)8701 906777 (1800 448 465)

2. HAZARDS IDENTIFICATION

2.1 GHS Classification

Flammable liquids (Category 2)

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)
H225 Highly flammable liquid and vapour.

Precautionary statement(s)

Prevention
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.

P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
Response	
P303 + P361 + P353	IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.
Storage	
P403 + P235	Store in a well-ventilated place. Keep cool.
Disposal	
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Other hazards - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms	:	Ethyl alcohol
Formula	:	C_2H_6O
Molecular Weight	:	46.07 g/mol
CAS-No.	:	64-17-5
EC-No.	:	200-578-6
Index-No.	:	603-002-00-5

Component	Classification	Concentration
Ethanol		
	Flam. Liq. 2; H225	-

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

no data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
no data available

5.3 Advice for firefighters
Wear self contained breathing apparatus for fire fighting if necessary.

5.4 Further information
Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up
Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13).

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
Keep away from sources of ignition - No smoking.Take measures to prevent the build up of electrostatic charge.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Store in cool place. Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

Hygroscopic.

7.3 Specific end use(s)
A part from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Occupational Exposure Limits

Component	CAS-No.	Value	Control parameters	Basis
Ethanol	64-17-5	TWA	1,000 ppm 1,880 mg/m3	Australia. Workplace Exposure Standards for Airborne Contaminants.
	Remarks	ACGIH is the documentation source		

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Full contact
Material: butyl-rubber
Minimum layer thickness: 0.3 mm
Break through time: 480 min
Material tested:Butoject® (KCL 897 / Aldrich Z677647, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.2 mm
Break through time: 38 min
Material tested:Dermatril® P (KCL 743 / Aldrich Z677388, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
impervious clothing, Flame retardant antistatic protective clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid, clear Colour: colourless
b)	Odour	no data available

c)	Odour Threshold	no data available
d)	pH	no data available
e)	Melting point/freezing point	Melting point/range: -114 °C - lit.
f)	Initial boiling point and boiling range	78.3 °C
g)	Flash point	14.0 °C - closed cup
h)	Evapouration rate	no data available
i)	Flammability (solid, gas)	no data available
j)	Upper/lower flammability or explosive limits	Upper explosion limit: 19 %(V) Lower explosion limit: 3.3 %(V)
k)	Vapour pressure	59.5 hPa at 20.0 °C
l)	Vapour density	no data available
m)	Relative density	0.789 g/mL at 20 °C0.789 g/mL at 25 °C
n)	Water solubility	completely soluble
o)	Partition coefficient: n-octanol/water	no data available
p)	Auto-ignition temperature	363.0 °C
q)	Decomposition temperature	no data available
r)	Viscosity	no data available
s)	Explosive properties	no data available
t)	Oxidizing properties	no data available

9.2 Other safety information
no data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
no data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
no data available

10.4 Conditions to avoid
Heat, flames and sparks. Extremes of temperature and direct sunlight.

10.5 Incompatible materials
Alkali metals, Ammonia, Oxidizing agents, Peroxides

10.6 Hazardous decomposition products
Other decomposition products - no data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - rat - 7,060 mg/kg
Remarks: Lungs, Thorax, or Respiration:Other changes.

LC50 Inhalation - rat - 10 h - 20000 ppm

Skin corrosion/irritation
Skin - rabbit
Result: Irritating to skin. - 24 h

Serious eye damage/eye irritation
Eyes - rabbit
Result: Mild eye irritation - 24 h
(Draize Test)

Respiratory or skin sensitisation
no data available

Germ cell mutagenicity
no data available

Carcinogenicity

Carcinogenicity - mouse - Oral
Tumorigenic:Equivocal tumorigenic agent by RTECS criteria. Liver:Tumors. Blood:Lymphomas including Hodgkin's disease.

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

Reproductive toxicity

Reproductive toxicity - Human - female - Oral
Effects on Newborn: Apgar score (human only). Effects on Newborn: Other neonatal measures or effects. Effects on Newborn: Drug dependence.

Specific target organ toxicity - single exposure
no data available

Specific target organ toxicity - repeated exposure
no data available

Aspiration hazard
no data available

Additional Information
RTECS: KQ6300000

Central nervous system depression, narcosis, Damage to the heart., To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

12. ECOLOGICAL INFORMATION

12.1 Toxicity
no data available

12.2 Persistence and degradability
no data available

12.3 Bioaccumulative potential
no data available

12.4 Mobility in soil
no data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

no data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

14.1 UN number

ADR/RID: 1170	IMDG: 1170	IATA-DGR: 1170

14.2 UN proper shipping name

ADR/RID:	ETHANOL
IMDG:	ETHANOL
IATA-DGR:	Ethanol

14.3 Transport hazard class(es)

ADR/RID: 3	IMDG: 3	IATA-DGR: 3

14.4 Packaging group

ADR/RID: II	IMDG: II	IATA-DGR: II

14.5 Environmental hazards

ADR/RID: no	IMDG Marine pollutant: no	IATA-DGR: no

14.6 Special precautions for user
no data available

15. REGULATORY INFORMATION

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Standard for the Uniform Scheduling of Medicines and Poisons
no data available

Carcinogen classification under WHS Regulation 2011, Schedule 10
Not listed

Notification status

AICS:	On the inventory, or in compliance with the inventory
DSL:	All components of this product are on the Canadian DSL.
ENCS:	On the inventory, or in compliance with the inventory
IECSC:	On the inventory, or in compliance with the inventory
ISHL:	On the inventory, or in compliance with the inventory
KECI:	On the inventory, or in compliance with the inventory

NZIoC:	On the inventory, or in compliance with the inventory
PICCS:	On the inventory, or in compliance with the inventory

16. OTHER INFORMATION

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

Flam. Liq.	Flammable liquids
H225	Highly flammable liquid and vapour.

Further information

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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

MATERIAL SAFETY DATA SHEET

Ethyl Ether

1. IDENTIFICATION OF SUBSTANCE / MIXTURE AND OF SUPPLIER

Product Identifier: High Purity Chemicals
Synonyms: Diethyl ether; Ethyl oxide; Ether
Other means of identification: CAS No. 60-29-7
EINECS No. 200-467-2

Recommended use of the chemical and restrictions on use:
General use solvent.

Supplier Details:

Pharmco Products, Inc.
58 Vale Road, Brookfield,
CT 06804, USA.
Tel: 203.740.3471
Fax: 203.740.3481
CCN17213

Pharmco Products, Inc.
1101 Isaac Shelby Drive, Shelbyville,
KY 40065, USA.
Tel: 502.232.7600
Fax: 502.633.6100
CCN17213

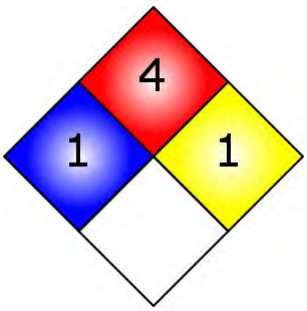
Emergency Contact: **CHEMTREC: 1.800.424.9300 (USA) / +1.703.527.3887 (International)**

2. HAZARDS IDENTIFICATION

OSHA Hazards:
Flammable liquid, Target Organ Effect, Irritant, Harmful by ingestion

Target Organs:
Central nervous system, Gastrointestinal tract, Kidney, Liver, Skeletal muscle

NFPA



GHS label elements, including precautionary statements

Signal Word:
DANGER!

Hazard statement(s)

H224	Extremely flammable liquid and vapour.
H302	Harmful if swallowed.
H336	May cause drowsiness or dizziness.

Precautionary statement(s)

P261	Avoid breathing dust/fumes/gas/mist/vapors.
P501	Dispose of contents and container to an approved waste disposal plant.
P270	Do not eat, drink or smoke when using this product.
P240	Ground/bond container and receiving equipment.
P304 + P340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P303 + P361 + P353	IF ON SKIN (or hair): Remove immediately all contaminated clothing. Rinse skin with water.
P301 + P312	IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.
P210	Keep away from heat, sparks, open flames, and hot surfaces. No smoking.
P233	Keep container tightly closed.
P330	Rinse Mouth.
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.
P243	Take precautionary measures against static discharge.
P241	Use explosion-proof electrical, ventilating, and lighting equipment.
P242	Use only non-sparking tools.
P271	Use only outdoors or in a well-ventilated area.
P264	Wash hands thoroughly after handling.
P280	Wear protective gloves and eye and face protection.

GHS Classification(s)
Acute toxicity, Oral (Category 4)

Flammable Liquids (Category 1)
Specific target organ toxicity - single exposure (Category 3)

Other hazards which do not result in classification:

Potential Health Effects:
Potential to form explosive peroxides

Organ	Description
Eyes	Can be harmful, causing irritation, to the eyes.
Ingestion	Can be harmful if ingested.
Inhalation	Can be harmful, causing irritation to the respiratory tract, if inhaled.
Skin	Can be harmful, causing irritation, dryness, and cracking, if absorbed through skin.

3. COMPOSITION AND INFORMATION ON INGREDIENTS

Chemical identity: Ethyl Ether
Common name / Synonym: Diethyl ether; Ethyl oxide; Ether
CAS number: 60-29-7
EINECS number: 200-467-2
ICSC number: 0355
RTECS #: KI5775000
UN #: 1155
EC #: 603-022-00-4

% Weight	Material	CAS
100	Ethyl Ether	60-29-7

4. FIRST AID MEASURES

General advice

Take proper precautions to ensure your own health and safety before attempting rescue and providing first aid. Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

Skin

Wash skin with soap and copious amounts of water. Seek medical attention.

Inhalation

Remove person to fresh air. Seek medical attention. Give oxygen or artificial respiration as needed.

Eyes

Thoroughly flush the eyes with large amounts of clean low-pressure water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Seek medical attention.

Ingestion

DO NOT induce vomiting. If vomiting does occur, have victim lean forward to prevent aspiration. Rinse mouth with water. Seek medical attention. Never give anything by mouth to an unconscious individual.

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5. FIRE FIGHTING MEASURES

Suitable (and unsuitable) extinguishing media:

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Specific hazards arising from the chemical (e.g., nature of any hazardous combustion products):

Carbon oxides expected to be the primary hazardous combustion product.

Special protective equipment and precautions for firefighters:

Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes. Keep unopened containers cool by spraying with water.

Unusual Fire and Explosion Hazards:

- Extremely flammable

Flammable Properties

Classification

OSHA/NFPA Class IA Flammable Liquid.

Flash point

-45 °C (-49 °F) - closed cup

Autoignition temperature

180 °C (356 °F)

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6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures:

Do not inhale vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas.

Environmental precautions:

Stop leak. Contain spill if possible and safe to do so. Prevent product from entering drains.

Methods and materials for containment and cleaning up:

Highly flammable liquid. Eliminate all sources of ignition. All equipment used when handling this product must be grounded. A vapor suppressing foam may be used to reduce vapors. Do not touch or walk through spilled material. Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations. Use clean non-sparking tools to collect absorbed material.

7. HANDLING AND STORAGE

Precautions for safe handling:

Do not get on skin or in eyes. Do not inhale vapor or mist. Keep away from sources of ignition - No smoking. Take measures to prevent the buildup of electrostatic charge.

Conditions for safe storage, including any incompatibilites:

Keep container tightly closed in a cool, dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters, e.g., occupational exposure limit values or biological limit values:

Occupational Exposure Limits

Component	Source	Type	Value	Note
Ethyl Ether	US (OSHA)	STEL	500 ppm, 1500 mg/m3	29 CFR 1910.1000 Table Z-1 Limits for Air Contaminants
Ethyl Ether	US (OSHA)	TWA	400 ppm, 1200 mg/m3	29 CFR 1910.1000 Table Z-1 Limits for Air Contaminants

Appropriate engineering controls:

General room or local exhaust ventilation is usually required to meet exposure limit(s). Electrical equipment should be grounded and conform to applicable electrical code.

Individual protection measures, such as personal protective equipment:

Respiratory protection:

Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Hand protection:

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Eye protection:

Use chemical safety goggles and/or a full face shield where splashing is possible. Use equipment approved by appropriate government standards, such as NIOSH (US) or EN166 (EU) Maintain eye wash fountain and quick-drench facilities in work area.

Skin and body protection:

Wear impervious, flame retardant, antistatic protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Hygiene measures:
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance *(physical state, color, etc.)*	Liquid. Colorless, clear.
Odor	Specific data not available
Odor threshold	Specific data not available
pH	Specific data not available
Freezing point	-116 °C (-177 °F)
Initial boiling point and boiling range	35 °C (94 °F)
Flash point	-45 °C (-49 °F) - closed cup
Evaporation rate	Specific data not available
Flammability (solid, gas)	Flammable
Upper / Lower flammability or explosive limits	36.0 %(V) / 1.9 %(V)
Vapor pressure	563 hPa (422 mmHg) at 20 °C (68 °F)
Vapor Density	2.56
Relative Density	0.71 g/cm3 at 20 °C (68 °F)
Solubility(ies)	Soluble
Partition coefficient n-octanol/water(ies)	log Pow: 0.89
Auto-ignition temperature	180 °C (356 °F)
Decomposition temperature	Specific data not available
Formula (ETHYL ETHER)	C4H10O
Molecular Weight (ETHYL ETHER)	74.12 g/mol

10. STABILITY AND REACTIVITY

Chemical Stability	Stable under recommended storage conditions.
Possibility of hazardous reactions	Vapors may form explosive mixture with air.
Conditions to avoid (e.g., static discharge, shock or vibration)	Heat, flames, and sparks. Extreme temperatures and direct sunlight.
Incompatible materials	Strong acids, oxidizing agents
Hazardous decomposition products	Carbon oxides are expected to be, under fire conditions, the primary hazardous decomposition products.

11. TOXICOLOGICAL INFORMATION

- Ethyl Ether 60-29-7

Product Summary:
Laboratory tests have shown mutagenic effects in animals. No data available for the reproductive or teratogenic effects of the product. No data available to designate the product as causing specific target organ toxicity through repeated exposure. No data available to designate product as an aspiration hazard.

Acute Toxicity:

LC50 (Inhalation)	Mouse	31,000 ppm	30 minutes
LD50 (Dermal)	Rabbit	>14.2 g/kg	
LD50 (Oral)	Rat	1,215 mg/kg	

Irritation:

Eyes
Rabbit - Mild eye irritation - Draize Test - 24 hours

Respiratory or Skin Sensitization
No data available

Skin
No data available

Specific target organ toxicity - single exposure (Globally Harmonized System)
Inhalation - May cause drowsiness or dizziness. - Central Nervous System

Carcinogenicity
IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable or confirmed human carcinogen by IARC.
ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Other Hazards

Organ	Description
Eyes	Can cause irritation to the eyes.
Ingestion	Can be harmful if ingested
Inhalation	Can be harmful, causing irritation to the respiratory tract, if inhaled. Vapors can cause drowsiness and dizziness.
Skin	Can be harmful, causing irritation, if absorbed through the skin.

12. ECOLOGICAL INFORMATION

- Ethyl Ether 60-29-7

Ecotoxicity (aquatic and terrestrial, where available):
Acute Fish Toxicity (ETHYL ETHER)
LC50 / 96 hours Fathead Minnow - 2,560 mg/L

Persistence and degradability:
No data available

Bioaccumulative potential:
No data available

Other adverse effects:
No data available

13. DISPOSAL CONSIDERATIONS

Description of waste residues and information on their safe handling and methods of disposal, including the disposal of any contaminated packaging:

Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Observe all federal, state, and local environmental regulations. Contact a licensed professional waste disposal service to dispose of this material.

14. TRANSPORT INFORMATION

Description of waste residues and information on their safe handling and methods of disposal:

UN number	1155
UN proper shipping name	Diethyl ether
Transport hazard class(es)	3
Packing group *(if applicable)*	I

Reportable Quantity
100 lbs
IMDG
UN-Number: 1155 Class: 3 Packing Group: I
EMS-No: F-E, S-D
Proper shipping name: DIETHYL ETHER
Marine pollutant: No
IATA

UN-Number: 1155 Class: 3 Packing Group: I
Proper shipping name: Diethyl ether

15. REGULATORY INFORMATION

Safety, health and environmental regulations specific for the product in question:

OSHA Hazards

Flammable liquid, Target Organ Effect, Irritant, Harmful by ingestion

All ingredients are on the following inventories or are exempted from listing

Country	Notification
Australia	AICS
Canada	DSL
China	IECS
European Union	EINECS
Japan	ENCS/ISHL
Korea	ECL
New Zealand	NZIoC
Philippines	PICCS
United States of America	TSCA

SARA 302 Components

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

SARA 313 Components

SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards

Acute Health Hazard
Chronic Health Hazard
Fire Hazard

CERCLA

Ethyl Ether CAS-No. 60-29-7, RQ: 100 lbs

Massachusetts Right To Know Components

Ethyl ether CAS-No. 60-29-7 Revision Date 2007-03-01

Pennsylvania Right To Know Components

Ethyl ether CAS-No. 60-29-7 Revision Date 2007-03-01

New Jersey Right To Know Components
Ethyl ether CAS-No. 60-29-7 Revision Date 2007-03-01

California Prop 65 Components
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

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16. OTHER INFORMATION:
INCLUDING INFORMATION ON PREPARATION AND REVISION OF THE SDS

Disclaimer
PHARMCO-AAPER believes that the information on this MSDS was obtained from reliable sources. However, the information is provided without any warranty, expressed or implied, regarding its correctness. Some information presented and conclusions drawn herein are from sources other than direct test data on the substance itself. The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, PHARMCO-AAPER does not assume responsibility and expressly disclaims liability for loss, damage, or expense arising out of or in any way connected with handling, storage, use, or disposal of this product. If the product is used as a component in another product, this MSDS information may not be applicable. Information is correct to the best of our knowledge at the date of the MSDS publication.

Fisher Scientific

Part of Thermo Fisher Scientific

SAFETY DATA SHEET

Creation Date 22-Jun-2009 **Revision Date** 28-Oct-2014 **Revision Number** 1

1. Identification

Product Name **Isooctane**

Cat No. : **O296-1; O296-4; O296RS-28; O296RS-115; O296SK-1; O296SK-4; O296SS-28; O296SS-50; O296SS-115; O296SS-200**

Synonyms Isooctane

Recommended Use Laboratory chemicals.

Uses advised against No Information available

Details of the supplier of the safety data sheet

Company
Fisher Scientific
One Reagent Lane
Fair Lawn, NJ 07410
Tel: (201) 796-7100

Emergency Telephone Number
CHEMTREC®, Inside the USA: 800-424-9300
CHEMTREC®, Outside the USA: 001-703-527-3887

2. Hazard(s) identification

Classification
This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Flammable liquids	Category 2
Skin Corrosion/irritation	Category 2
Serious Eye Damage/Eye Irritation	Category 2
Specific target organ toxicity (single exposure)	Category 3
Target Organs - Respiratory system, Central nervous system (CNS).	
Specific target organ toxicity - (repeated exposure)	Category 2
Target Organs - Kidney.	
Aspiration Toxicity	Category 1

Label Elements

Signal Word
Danger

Hazard Statements
Highly flammable liquid and vapor
May be fatal if swallowed and enters airways
Causes skin irritation
Causes serious eye irritation
May cause respiratory irritation
May cause drowsiness or dizziness

May cause damage to organs through prolonged or repeated exposure

Precautionary Statements
Prevention
Wash face, hands and any exposed skin thoroughly after handling
Wear protective gloves/protective clothing/eye protection/face protection
Do not breathe dust/fume/gas/mist/vapors/spray
Use only outdoors or in a well-ventilated area
Keep away from heat/sparks/open flames/hot surfaces. - No smoking
Keep container tightly closed
Ground/bond container and receiving equipment
Use explosion-proof electrical/ventilating/lighting/equipment
Use only non-sparking tools
Take precautionary measures against static discharge
Keep cool
Response
Get medical attention/advice if you feel unwell
Inhalation
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
Call a POISON CENTER or doctor/physician if you feel unwell
Skin
If skin irritation occurs: Get medical advice/attention
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower
Wash contaminated clothing before reuse
Eyes
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
If eye irritation persists: Get medical advice/attention
Ingestion
IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician
Do NOT induce vomiting
Fire
In case of fire: Use CO2, dry chemical, or foam for extinction
Storage
Store locked up
Store in a well-ventilated place. Keep container tightly closed
Disposal
Dispose of contents/container to an approved waste disposal plant
Hazards not otherwise classified (HNOC)
Very toxic to aquatic life with long lasting effects

3. Composition / information on ingredients

Component	CAS-No	Weight %
Isooctane	540-84-1	99

4. First-aid measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Obtain medical attention.

Skin Contact Wash off immediately with plenty of water for at least 15 minutes. Obtain medical attention.

Inhalation Move to fresh air. If breathing is difficult, give oxygen. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with a respiratory medical device. Obtain medical attention. Risk of serious damage to the lungs.

Ingestion Do not induce vomiting. Call a physician or Poison Control Center immediately. If vomiting occurs naturally, have victim lean forward.

Most important symptoms/effects Breathing difficulties. . Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting

Notes to Physician Treat symptomatically

5. Fire-fighting measures

Suitable Extinguishing Media CO_2, dry chemical, dry sand, alcohol-resistant foam. Use water spray to cool unopened containers. Cool closed containers exposed to fire with water spray.

Unsuitable Extinguishing Media Water may be ineffective, Do not use a solid water stream as it may scatter and spread fire

Flash Point -12 °C / 10.4 °F
Method - No information available

Autoignition Temperature 417 °C / 782.6 °F
Explosion Limits
Upper 6.0 vol %
Lower 1.1 vol %
Sensitivity to Mechanical Impact No information available
Sensitivity to Static Discharge No information available

Specific Hazards Arising from the Chemical
Flammable. Risk of ignition. Vapors may form explosive mixtures with air. Vapors may travel to source of ignition and flash back. Containers may explode when heated. Vapors may form explosive mixtures with air. Do not allow run-off from fire fighting to enter drains or water courses.

Hazardous Combustion Products
Carbon monoxide (CO) Carbon dioxide (CO_2)
Protective Equipment and Precautions for Firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Thermal decomposition can lead to release of irritating gases and vapors.

NFPA

Health	Flammability	Instability	Physical hazards
3	3	0	N/A

6. Accidental release measures

Personal Precautions Use personal protective equipment. Remove all sources of ignition. Take precautionary measures against static discharges. Do not get in eyes, on skin, or on clothing.

Environmental Precautions Do not flush into surface water or sanitary sewer system. Do not allow material to contaminate ground water system. Prevent product from entering drains. Local authorities should be advised if significant spillages cannot be contained.

Methods for Containment and Clean Up Remove all sources of ignition. Soak up with inert absorbent material. Take precautionary measures against static discharges. Keep in suitable, closed containers for disposal. Use spark-proof tools and explosion-proof equipment.

7. Handling and storage

Handling Wear personal protective equipment. Keep away from open flames, hot surfaces and sources of ignition. Take precautionary measures against static discharges. Use only non-sparking tools. To avoid ignition of vapors by static electricity discharge, all metal parts

of the equipment must be grounded. Use explosion-proof equipment.

Storage Keep away from open flames, hot surfaces and sources of ignition. Keep containers tightly closed in a dry, cool and well-ventilated place. Flammables area. Keep away from heat and sources of ignition.

8. Exposure controls / personal protection

Exposure Guidelines

Component	ACGIH TLV	OSHA PEL	NIOSH IDLH
Isooctane	TWA: 300 ppm		

Legend

ACGIH - American Conference of Governmental Industrial Hygienists

Engineering Measures Use only under a chemical fume hood. Use explosion-proof electrical/ventilating/lighting/equipment. Ensure that eyewash stations and safety showers are close to the workstation location. Ensure adequate ventilation, especially in confined areas.

Personal Protective Equipment

Eye/face Protection Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin and body protection Wear appropriate protective gloves and clothing to prevent skin exposure.

Respiratory Protection No protective equipment is needed under normal use conditions.

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

9. Physical and chemical properties

Physical State	Liquid
Appearance	Colorless
Odor	Petroleum distillates
Odor Threshold	No information available
pH	Not applicable
Melting Point/Range	-107 °C / -160.6 °F
Boiling Point/Range	98 - 99 °C / 208.4 - 210.2 °F @ 760 mmHg
Flash Point	-12 °C / 10.4 °F
Evaporation Rate	No information available
Flammability (solid,gas)	Not applicable
Flammability or explosive limits	
Upper	6.0 vol %
Lower	1.1 vol %
Vapor Pressure	51 mbar @ 20 °C
Vapor Density	3.94
Relative Density	0.690
Solubility	Insoluble in water
Partition coefficient; n-octanol/water	No data available
Autoignition Temperature	417 °C / 782.6 °F
Decomposition Temperature	No information available
Viscosity	0.51 mPa s at 22 °C
Molecular Formula	C8 H18
Molecular Weight	114.23

10. Stability and reactivity

Reactive Hazard None known, based on information available

Stability Stable under normal conditions.

Conditions to Avoid Incompatible products. Heat, flames and sparks. Keep away from open flames, hot surfaces and sources of ignition.

Incompatible Materials Strong oxidizing agents, Strong acids, Strong bases

Hazardous Decomposition Products Carbon monoxide (CO), Carbon dioxide (CO_2)

Hazardous Polymerization Hazardous polymerization does not occur.

Hazardous Reactions None under normal processing.

11. Toxicological information

Acute Toxicity

Product Information

Component Information

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Isooctane	2500 mg/kg (Rat)	Not listed	47.4 mg/L (Rat) 1 h

Toxicologically Synergistic Products No information available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Irritation Irritating to eyes, respiratory system and skin

Sensitization No information available

Carcinogenicity The table below indicates whether each agency has listed any ingredient as a carcinogen.

Component	CAS-No	IARC	NTP	ACGIH	OSHA	Mexico
Isooctane	540-84-1	Not listed	Not listed	Not listed	Not listed	Not listed

Mutagenic Effects No information available

Reproductive Effects No information available.

Developmental Effects No information available.

Teratogenicity No information available.

STOT - single exposure Respiratory system Central nervous system (CNS)

STOT - repeated exposure Kidney

Aspiration hazard No information available

Symptoms / effects,both acute and delayed Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting

Endocrine Disruptor Information No information available

Other Adverse Effects The toxicological properties have not been fully investigated. See actual entry in RTECS for complete information.

12. Ecological information

Ecotoxicity

Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. The product contains following substances which are hazardous for the environment.

Persistence and Degradability Insoluble in water Persistence is unlikely based on information available.
Bioaccumulation/ Accumulation No information available.

Mobility Will likely be mobile in the environment due to its volatility. Is not likely mobile in the environment due its low water solubility.

13. Disposal considerations

Waste Disposal Methods Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

14. Transport information

DOT

UN-No	UN1262
Proper Shipping Name	OCTANES
Hazard Class	3
Packing Group	II

TDG

UN-No	UN1262
Proper Shipping Name	OCTANES
Hazard Class	3
Packing Group	II

IATA

UN-No	UN1262
Proper Shipping Name	OCTANES
Hazard Class	3
Packing Group	II

IMDG/IMO

UN-No	UN1262
Proper Shipping Name	OCTANES
Hazard Class	3
Packing Group	II

15. Regulatory information

International Inventories

Component	TSCA	DSL	NDSL	EINECS	ELINCS	NLP	PICCS	ENCS	AICS	IECSC	KECL
Isooctane	X	X	-	208-759-1	-		X	X	X	X	X

Legend:
X - Listed
E - Indicates a substance that is the subject of a Section 5(e) Consent order under TSCA.
F - Indicates a substance that is the subject of a Section 5(f) Rule under TSCA.
N - Indicates a polymeric substance containing no free-radical initiator in its inventory name but is considered to cover the designated polymer made with any free-radical initiator regardless of the amount used.
P - Indicates a commenced PMN substance
R - Indicates a substance that is the subject of a Section 6 risk management rule under TSCA.
S - Indicates a substance that is identified in a proposed or final Significant New Use Rule
T - Indicates a substance that is the subject of a Section 4 test rule under TSCA.
XU - Indicates a substance exempt from reporting under the Inventory Update Rule, i.e. Partial Updating of the TSCA Inventory Data Base Production and Site Reports (40 CFR 710(B).
Y1 - Indicates an exempt polymer that has a number-average molecular weight of 1,000 or greater.
Y2 - Indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.

U.S. Federal Regulations

TSCA 12(b) Not applicable

SARA 313 Not applicable

SARA 311/312 Hazardous Categorization

Acute Health Hazard	Yes
Chronic Health Hazard	Yes
Fire Hazard	Yes
Sudden Release of Pressure Hazard	No
Reactive Hazard	No

Clean Water Act Not applicable

Clean Air Act

Component	HAPS Data	Class 1 Ozone Depletors	Class 2 Ozone Depletors
Isooctane	X		-

OSHA Occupational Safety and Health Administration
Not applicable

CERCLA
This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

Component	Hazardous Substances RQs	CERCLA EHS RQs
Isooctane	1000 lb	-

California Proposition 65 This product does not contain any Proposition 65 chemicals

State Right-to-Know

Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
Isooctane	X	X	X	X	-

U.S. Department of Transportation

Reportable Quantity (RQ):	Y
DOT Marine Pollutant	N
DOT Severe Marine Pollutant	N

U.S. Department of Homeland Security
This product does not contain any DHS chemicals.

Other International Regulations

Mexico - Grade Serious risk, Grade 3

Canada
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR

WHMIS Hazard Class B2 Flammable liquid
D2B Toxic materials

16. Other information

Prepared By Regulatory Affairs
Thermo Fisher Scientific
Email: EMSDS.RA@thermofisher.com

Creation Date	22-Jun-2009
Revision Date	28-Oct-2014
Print Date	28-Oct-2014
Revision Summary	This document has been updated to comply with the US OSHA HazCom 2012 Standard replacing the current legislation under 29 CFR 1910.1200 to align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS)

Disclaimer

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

End of SDS

MATERIAL SAFETY DATA SHEET

SECTION 1. PRODUCT IDENTIFICATION

PRODUCT NAME: **Nitrogen, compressed**
CHEMICAL NAME: Nitrogen
FORMULA: N_2
SYNONYMS: Nitrogen gas, Gaseous Nitrogen, GAN

MANUFACTURER: **Air Products and Chemicals, Inc.**
7201 Hamilton Boulevard
Allentown, PA 18195 - 1501
PRODUCT INFORMATION: 1-800-752-1597
MSDS NUMBER: 1011 **REVISION:** 5
REVISION DATE: March 1994 **REVIEW DATE:** August 1997

SECTION 2. COMPOSITION/INFORMATION ON INGREDIENTS

Nitrogen is sold as pure product > 99%.
CAS NUMBER: 7727-37-9
EXPOSURE LIMITS:
OSHA: Not established **ACGIH:** Simple asphyxiant **NIOSH:** Not established

SECTION 3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Nitrogen is a nontoxic, odorless, colorless, nonflammable compressed gas stored in cylinders at high pressure. It can cause rapid suffocation when concentrations are sufficient to reduce oxygen levels below 19.5%. Self Contained Breathing Apparatus (SCBA) may be required.

EMERGENCY TELEPHONE NUMBERS
800-523-9374 Continental U.S. , Canada and Puerto Rico
610-481-7711 other locations

POTENTIAL HEALTH EFFECTS INFORMATION:

INHALATION: Simple asphyxiant. Nitrogen is nontoxic, but may cause suffocation by displacing the oxygen in air. Lack of sufficient oxygen can cause serious injury or death.

EYE CONTACT: No adverse effect.

SKIN CONTACT: No adverse effect.

EXPOSURE INFORMATION:

ROUTE OF ENTRY: Inhalation

TARGET ORGANS: None

EFFECT: Asphyxiation (suffocation)

SYMPTOMS: Exposure to an oxygen deficient atmosphere (<19.5%) may cause dizziness, drowsiness, nausea, vomiting, excess salivation, diminished mental alertness, loss of consciousness and death. Exposure to atmospheres containing 8-10% or less oxygen will bring about unconsciousness without warning and so quickly that the individuals cannot help themselves.

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: None

CARCINOGENIC POTENTIAL: Nitrogen is not listed as a carcinogen or potential carcinogen by NTP, IARC, or OSHA .

SECTION 4. FIRST AID

INHALATION: Persons suffering from lack of oxygen should be moved to fresh air. If victim is not breathing, administer artificial respiration. If breathing is difficult, administer oxygen. Obtain prompt medical attention.

EYE CONTACT: Not applicable.

SKIN CONTACT: Not applicable.

SECTION 5. FIRE AND EXPLOSION

FLASH POINT:	AUTOIGNITION:	FLAMMABLE LIMITS:
Not applicable	Nonflammable	Nonflammable

EXTINGUISHING MEDIA: Nitrogen is nonflammable and does not support combustion. Use extinguishing media appropriate for the surrounding fire.

HAZARDOUS COMBUSTION PRODUCTS: None

SPECIAL FIRE FIGHTING INSTRUCTIONS: Nitrogen is a simple asphyxiant. If possible, remove nitrogen cylinders from fire area or cool with water. SCBA may be required by rescue workers.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Upon exposure to intense heat or flame cylinder may vent rapidly and/or rupture violently. Most cylinders are designed to vent contents when exposed to elevated temperatures. Pressure in a container can build up due to heat and it may rupture if pressure relief devices should fail to function.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Evacuate all personnel from affected area. Increase ventilation to release area and monitor oxygen level. Use appropriate protective equipment (SCBA). If leak is from container or its valve, call the Air Products emergency telephone number. If leak is in user's system close cylinder valve and vent pressure before attempting repairs.

SECTION 7. HANDLING AND STORAGE

STORAGE: Cylinders should be stored upright in a well-ventilated, secure area, protected from the weather. Storage area temperatures should not exceed 125 °F (52 °C) and area should be free of combustible materials. Storage should be away from heavily traveled areas and emergency exits. Avoid areas where salt or other corrosive materials are present. Valve protection caps and valve outlet seals should remain on cylinders not connected for use. Separate full from empty cylinders. Avoid excessive inventory and storage time. Use a first-in first-out system. Keep good inventory records.

HANDLING: Do not drag, roll, or slide cylinder. Use a suitable handtruck designed for cylinder movement. Never attempt to lift a cylinder by its cap. Secure cylinders at all times while in use. Use a pressure reducing regulator or separate control valve to safely discharge gas from cylinder. Use a check valve to prevent reverse flow into cylinder. Do not overheat cylinder to increase pressure or discharge rate. If user experiences any difficulty operating cylinder valve, discontinue use and contact supplier. Never insert an object (e.g., wrench, screwdriver, pry bar, etc.) into valve cap openings. Doing so may

damage valve causing a leak to occur. Use a special cap wrench or adjustable strap-wrench to remove over-tight or rusted caps.

Nitrogen is compatible with all common materials of construction. Pressure requirements should be considered when selecting materials and designing systems.

SPECIAL REQUIREMENTS: Always store and handle compressed gases in accordance with Compressed Gas Association, Inc. (ph. 703-412-0900) pamphlet CGA P-1, ***Safe Handling of Compressed Gases in Containers.*** Local regulations may require specific equipment for storage or use.

CAUTION: Users of nitrogen must be aware of the hazards caused by the accumulation of high concentrations, especially in confined spaces. Compliance with OSHA regulations, especially 29 CFR 1910.146 (confined space entry), is essential

SECTION 8. PERSONAL PROTECTION / EXPOSURE CONTROL

ENGINEERING CONTROLS: Provide good ventilation and/or local exhaust to prevent accumulation of high concentrations of gas. Oxygen levels in work area should be monitored to ensure they do not fall below 19.5%.

RESPIRATORY PROTECTION:

GENERAL USE: None required.

EMERGENCY: Use SCBA or positive pressure air line with mask and escape pack in areas where oxygen concentration is less than 19.5%. Air purifying respirators will not provide protection.

OTHER PROTECTIVE EQUIPMENT: Safety glasses. Safety shoes and leather work gloves are recommended when handling cylinders.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Colorless gas

ODOR: Odorless

MOLECULAR WEIGHT: 28.01

BOILING POINT (1 Atm): -320.4 °F (-195.8 °C)

SPECIFIC GRAVITY (Air =1): 0.967

SPECIFIC VOLUME (at 70 °F (21.1 °C) and 1 atm): 13.81 ft^3/lb (0.867m^3/kg)

FREEZING POINT/MELTING POINT: -345.8 °F (-209.9 °C)

VAPOR PRESSURE: Not applicable at 70 °F

GAS DENSITY (at 70 °F (21.1 °C) and 1 atm): 0.072 lb/ft^3 (1.153 kg/m^3)

SOLUBILITY IN WATER (Vol./Vol. at 32°F (0°C)): 0.023

SECTION 10. STABILITY AND REACTIVITY

CHEMICAL STABILITY: Stable

CONDITIONS TO AVOID: None

INCOMPATIBILITY: None

HAZARDOUS DECOMPOSITION PRODUCTS: None

HAZARDOUS POLYMERIZATION: Will not occur.

SECTION 11. TOXICOLOGICAL INFORMATION

Nitrogen is a simple asphyxiant.

SECTION 12. ECOLOGICAL INFORMATION

The atmosphere contains approximately 78% nitrogen. No adverse ecological effects are expected. Nitrogen does not contain any Class I or Class II ozone depleting chemicals. Nitrogen is not listed as a marine pollutant by DOT (49 CFR 171).

SECTION 13. DISPOSAL

UNUSED PRODUCT / EMPTY CONTAINER: Return cylinder and unused product to supplier. Do not attempt to dispose of residual or unused quantities.

DISPOSAL: For emergency disposal, secure the cylinder and slowly discharge gas to the atmosphere in a well ventilated area or outdoors.

SECTION 14. TRANSPORT INFORMATION

DOT HAZARD CLASS: 2.2

DOT SHIPPING LABEL: Nonflammable Gas

DOT SHIPPING NAME: Nitrogen, Compressed

IDENTIFICATION NUMBER: UN1066

REPORTABLE QUANTITY (RQ): None

SPECIAL SHIPPING INFORMATION: Cylinders should be transported in a secure upright position in a well ventilated truck. Never transport in passenger compartment of a vehicle.

Compressed gas cylinders shall not be refilled except by qualified producers of compressed gases. Shipment of a compressed gas cylinder which has not been filled by the owner or with the owner's written consent is a violation of federal law.

SECTION 15. REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS:

ENVIRONMENTAL PROTECTION AGENCY (EPA):

CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act of 1980 requires notification to the National Response Center of a release of quantities of hazardous substances equal to or greater than their reportable quantities (RQ's) in 40 CFR 302.4.

CERCLA Reportable Quantity: None.

SARA TITLE III: Superfund Amendment and Reauthorization Act of 1986

SECTION 302/304: Requires emergency planning on threshold planning quantities (TPQ) and release reporting based on reportable quantities (RQ) of EPA's extremely hazardous substances (40 CFR 355).

Nitrogen is not listed as an extremely hazardous substance.

Threshold Planning Quantity (TPQ): None

SECTIONS 311/312: Require submission of material safety data sheets (MSDSs) and chemical inventory reporting with identification of EPA defined hazard classes. The hazard classes for this product are:

IMMEDIATE HEALTH: No

DELAYED HEALTH: No

PRESSURE: Yes

REACTIVITY: No

FIRE: No

SECTION 313: Requires submission of annual reports of release of toxic chemicals that appear in 40 CFR 372.

Nitrogen does not require reporting under Section 313.

40 CFR Part 68 - Risk Management for Chemical Accident Release Prevention: Requires the development and implementation of risk management programs at facilities that manufacture, use, store, or otherwise handle regulated substances in quantities that exceed specified thresholds.

Nitrogen is not listed as a regulated substance.

TSCA - TOXIC SUBSTANCES CONTROL ACT: Nitrogen is listed on the TSCA inventory.

OSHA - OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION:

29 CFR 1910.119 - Process Safety Management of Highly Hazardous Chemicals: Requires facilities to develop a process safety management program based on Threshold Quantities (TQ) of highly hazardous chemicals.

Nitrogen is not listed in Appendix A as a highly hazardous chemical.

STATE REGULATIONS

CALIFORNIA:

Proposition 65: This product does NOT contain any listed substances which the State of California requires warning under this statute.

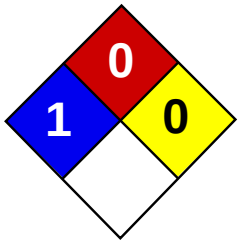
SCAQMD Rule: VOC = Not applicable

SECTION 16. OTHER INFORMATION

NFPA RATINGS:		HMIS RATINGS:	
HEALTH:	0	HEALTH:	0
FLAMMABILITY:	0	FLAMMABILITY:	0
REACTIVITY:	0	REACTIVITY:	0
SPECIAL:	SA*		

*Compressed Gas Association recommendation to designate simple asphyxiant.

***** Documents with Review Dates August 1997 and Revision Date March 1994 are identical in content and either may be used.***



Health	1
Fire	0
Reactivity	0
Personal Protection	E

Material Safety Data Sheet
Potassium Iodide MSDS

Section 1: Chemical Product and Company Identification

Product Name: Potassium Iodide

Catalog Codes: SLP2050, SLP1042, SLP2854

CAS#: 7681-11-0

RTECS: TT2975000

TSCA: TSCA 8(b) inventory: Potassium Iodide

CI#: Not available.

Synonym:

Chemical Name: Potassium Iodide

Chemical Formula: KI

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Potassium Iodide	7681-11-0	100

Toxicological Data on Ingredients: Potassium Iodide LD50: Not available. LC50: Not available. Lowest Published Lethal Dose: LDL [Mouse] - Route: Oral; Dose: 1862 mg/kg LDL [Rabbit] - Route: Oral; Dose: 916 mg/kg

Section 3: Hazards Identification

Potential Acute Health Effects: Slightly hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Classified Reproductive system/toxin/female, Development toxin [POSSIBLE]. The substance may be toxic to thyroid. Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention if irritation occurs.

Skin Contact:
Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops. Cold water may be used.

Serious Skin Contact: Not available.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation: Not available.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Non-flammable.

Auto-Ignition Temperature: Not applicable.

Flash Points: Not applicable.

Flammable Limits: Not applicable.

Products of Combustion: Some hazardous decomposition products are: Hydrogen Iodide, Oxides of potassium , iodine

Fire Hazards in Presence of Various Substances: Not applicable.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions: Not applicable.

Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards: Potassium iodide + Fluorine Perchlorate will explode on contact.

Section 6: Accidental Release Measures

Small Spill:
Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

Large Spill:
Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system.

Section 7: Handling and Storage

Precautions:
Do not breathe dust. Wear suitable protective clothing. If you feel unwell, seek medical attention and show the label when possible. Keep away from incompatibles such as oxidizing agents, reducing agents, metals, acids, moisture.

Storage:
Moisture Sensitive. Light Sensitive. Air SensitiveKeep container tightly closed in light-resistant containers. Keep container in a cool, well-ventilated area.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection: Safety glasses. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits: Not available.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid. (Deliquescent crystals solid.)

Odor: Odorless.

Taste: Bitter. Saline. (Strong.)

Molecular Weight: 166 g/mole

Color: White.

pH (1% soln/water): Not available.

Boiling Point: 1330°C (2426°F)

Melting Point: 681°C (1257.8°F)

Critical Temperature: Not available.

Specific Gravity: 3.1 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water, methanol, acetone.

Solubility:
Easily soluble in cold water, hot water. Soluble in methanol. Partially soluble in acetone.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability:
Light, moisture, incompatible materials. It is stable under ordinary conditions of use and storage. On long exposure to air, it becomes yellow due to release of iodine.

Incompatibility with various substances: Reactive with oxidizing agents, reducing agents, organic materials, metals, acids.

Corrosivity:
Corrosive in presence of steel, of aluminum, of zinc. Non-corrosive in presence of glass, of copper, of stainless steel(304), of stainless steel(316).

Special Remarks on Reactivity:
Moisture Sensitive. Light Sensitive. Air Sensitive. Air causes decomposition to iodine. Reacts violently with strong oxidizers, bromotrifluorides, chlorotrifluorides, fluorine perchlorate, metallic salts. Attacks metals in moist environments. Also incompatible with salts of alkaloids, chloral hydrate, calomel (mercurous chloride), potassium chlorate, tartaric and other acids, oxidants, diazonium salts, charcoal, ozone, strong reducers, alkali metals, metals (brass, aluminum magnesium, zinc, cadmium, copper, tin, nickel, steel), metallic salts, organic materials, light.

Special Remarks on Corrosivity:
Incompatible with water, producing a corrosive. Corrosive in all concentrations to most metals, except stainless steel, titanium, and tantalum.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Inhalation. Ingestion.

Toxicity to Animals:
LD50: Not available. LC50: Not available.

Chronic Effects on Humans:
MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells. DEVELOPMENTAL TOXICITY: Classified Reproductive system/toxin/female, Development toxin [POSSIBLE]. May cause damage to the following organs: thyroid.

Other Toxic Effects on Humans: Slightly hazardous in case of skin contact (irritant), of ingestion, of inhalation.

Special Remarks on Toxicity to Animals:
Lowest Published Lethal Dose: LDL [Mouse] - Route: Oral; Dose: 1862 mg/kg LDL[Rabbit] - Route: Oral; Dose: 916 mg/kg

Special Remarks on Chronic Effects on Humans:
Can cause adverse reproductive efects and birth defects based on animal data. May affect genetic material based on animal data

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects: Skin: May cause skin irritation. Eyes: May cause eye irritation. Inhalation: May cause respiratory tract and mucous membrane irritation and a productive cough. May cause pulmonary edema and inflammation of the tonsils. Ingestion: Causes gastrointestinal tract irritation with nausea, vomiting and diarrhea. May affect behavior (somnolence, muscle weakness), respiration (dyspnea). Serum-sickness type of hypersensitivity such as fever, arthralgia, lymph node enlargement , and eosinophilia may appear. Thrombotic thrombocytopenic purpura, and fatal periarteritis nodosa attributed to hypersensitivity to iodide has been described. Chronic Potential Health Effects: Can lead to iodism characterized by salivation, nasal discharge, sneezing, conjunctivitis, fever, headache, laryngitis, bronchitis, stomatits, parotitis, anemia, and skin rashes. Chronic ingestion may also affect metabolism (anorexia), and thyroid gland (hypothyroidism, goiter). Furthermore, chronic ingestion of iodides (in animals) during pregnancy has resulted in fetal deaths, severe goiter and cretinoid appearance of the newborn.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The product itself and its products of degradation are not toxic.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Not a DOT controlled material (United States).

Identification: Not applicable.

Special Provisions for Transport: Not applicable.

Section 15: Other Regulatory Information

Federal and State Regulations: TSCA 8(b) inventory: Potassium Iodide

Other Regulations: EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada): CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

DSCL (EEC):
Not available Not applicable.

HMIS (U.S.A.):

Health Hazard: 1

Fire Hazard: 0

Reactivity: 0

Personal Protection: E

National Fire Protection Association (U.S.A.):

Health: 1

Flammability: 0

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Safety glasses.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/11/2005 12:21 PM

Last Updated: 05/21/2013 12:00 PM

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Material Safety Data Sheet

Sodium Hydroxide Solution

MSDS Number 26500TDC (Reviewed: 09/12/2010) 6 Pages

Section 1: CHEMICAL PRODUCT and COMPANY IDENTIFICATION

1.1 Product Name .....**Sodium Hydroxide solution**
Chemical Family ..... Inorganic salt solution
Synonyms ..... Sodium hydroxide, caustic, caustic soda
Formula ..... NaOH

1.2 Manufacturer .....TDC, LLC
1916 Farmerville Highway
Ruston, Louisiana 71270
Information ..... (318) 242-5305

1.3 Emergency Contact ..... (800) 422-6274
(800) 424-9300 (**CHEMTREC)**

Section 2: COMPOSITION, INFORMATION ON INGREDIENTS

2.1 Chemical Ingredients (% by wt.)

		Typical Analysis
Sodium hydroxide	CAS #: 1310-73-2	49-51%
Sodium Carbonate	CAS #: 497-19-8	<0.2%
Sodium Chloride	CAS #: 7647-14-5	<1.0%
Water	CAS #:7732-18-5	Balance

(See Section 8 for exposure guidelines)

Section 3: HAZARDS IDENTIFICATION

NFPA: Health - 3 Flammability - 0 Reactivity - 2

Section 3: HAZARDS IDENTIFICATION (Cont.)

EMERGENCY OVERVIEW

Warning: Solution is highly alkaline

Contact will cause marked eye irritation and possible corneal damage.
Skin contact will result in irritation and possible corrosion of the skin.
Ingestion will irritate/burn mouth, throat and gastrointestinal tract.

3.1 POTENTIAL HEALTH EFFECTS

EYE: Contact with the eyes will cause marked eye irritation and possibly severe corneal damage.

SKIN CONTACT: Contact with the skin will cause skin irritation or burning sensation. Prolonged contact will result in corrosion of the skin.

SKIN ABSORPTION: Absorption is unlikely to occur.

INGESTION: Ingestion will result in severe burning and corrosion of mouth, throat and the gastrointestinal tract.

INHALATION: Breathing product mist or spray may cause damage to the upper respiratory tract and lung tissue which could develop into chemical pneumonia depending upon severity of exposure.

CHRONIC EFFECTS/CARCINOGENICITY: Not listed as a carcinogen by NTP, IARC or OSHA.

Section 4: FIRST AID MEASURES

4.1 EYES: Immediately flush with large quantities of water for 15 minutes. Hold eyelids apart during irrigation to insure thorough flushing of the entire area of the eye. Obtain immediate medical attention.

4.2 SKIN: Immediately flush with large quantities of water. Remove contaminated clothing under a safety shower. Obtain immediate medical attention

4.3 INGESTION: DO NOT INDUCE VOMITING. If victim is conscious, immediately give 2 to 4 glasses of water. If vomiting does occur, repeat fluid administration. Obtain immediate medical attention.

4.4 INHALATION: Remove victim from contaminated atmosphere. If breathing is labored, administer oxygen. If breathing has ceased, clear airway and start mouth to mouth resuscitation. If heart has stopped beating, external heart massage should be applied. Obtain immediate medical attention.

Section 5: FIRE FIGHTING MEASURES

5.1 FLAMMABLE PROPERTIES

FLASH POINT: Not flammable **METHOD USED:** NA

5.2 FLAMMABLE LIMITS NA

5.3 EXTINGUISHING MEDIA: Water spray or foam or as appropriate for combustibles involved in fire.

5.4 FIRE & EXPLOSIVE HAZARDS: Solution is non-flammable. Keep containers/storage vessels in fire area cooled with water spray.

Section 5: FIRE FIGHTING MEASURES, Cont.

5.5 FIRE FIGHTING EQUIPMENT: Wear self-contained breathing apparatus, positive pressure, MSHA/NIOSH (approved or equivalent) and full protective gear.

Section 6: ACCIDENTAL RELEASE MEASURES

6.1 Small releases: Confine and absorb small releases on sand earth or other inert absorbent. Neutralize solution with weak (~5%) acetic acid if necessary. DO NOT NEUTRALIZE WITH STRONG MINERAL ACIDS, THIS WILL EVOLVE LARGE AMOUNTS OF HEAT.

6.2 Large releases: Wear proper protective equipment. Confine area to qualified personnel. Shut off release if safe to do so. Dike spill area to prevent runoff into sewers, drains or surface waterways (potential aquatic toxicity). Recover as much of the solution as possible. Treat remaining material as a small release (above). DO NOT NEUTRALIZE WITH STRONG MINERAL ACIDS, THIS WILL EVOLVE LARGE AMOUNTS OF HEAT.

Section 7: HANDLING and STORAGE

7.1 Handling: Wear proper protective equipment (See Section 8). Avoid breathing product mist or spray. Avoid contact with skin and eyes. Use only in a well ventilated area. Dilute product only in enclosed containers. Wash thoroughly after handling.

7.2 Storage: Store in well ventilated areas. Do not store combustibles in the area of storage vessels. Keep away from any sources of heat or flame. Store tote and smaller containers out of direct sunlight at moderate temperatures [<80º F (27º C)]. (See Section 10.4 for materials of construction)

Section 8: EXPOSURE CONTROLS, PERSONAL PROTECTION

8.1 RESPIRATORY PROTECTION: If working near open container or storage vessel opening or open tank truck dome cover, wear self-contained breathing apparatus, positive pressure, MSHA/NIOSH (approved or equivalent).

8.2 SKIN PROTECTION: Neoprene rubber gloves, chemical suit and boots should be worn to prevent contact with the liquid. Wash contaminated clothing prior to reuse. Contaminated leather shoes cannot be cleaned and should be discarded.

8.3 EYE PROTECTION: Chemical goggles and a full face shield.

8.4 EXPOSURE GUIDELINES:

OSHA		ACGIH	
TWA	STEL	TLV	STEL
2 ppm		2 ppm (ceiling)	

8.5 ENGINEERING CONTROLS: Use adequate exhaust ventilation to prevent inhalation of product vapors. Where feasible scrub process or storage vessel vapors with caustic solution. Maintain eyewash/safety shower in areas where chemical is handled.

Section 9: PHYSICAL and CHEMICAL PROPERTIES

9.1 APPEARANCE:	Colorless to slightly hazy liquid.
9.2 ODOR:	No distinct odor.
9.3 BOILING POINT:	293ºF (145ºC)
9.4 VAPOR PRESSURE:	1.5 mm Hg, (0.2 Pa) @ 20°C
9.5 VAPOR DENSITY: (Air = 1.0)	Not applicable
9.6 SOLUBILITY IN WATER:	Complete
9.7 SPECIFIC GRAVITY:	1.52 (12.66 lbs/gal) @ 20°C
9.8 FREEZING POINT:	Approximately 58ºF (14ºC)
9.9 pH:	14.0
9.10 VOLATILE:	Not determined

Section 10: STABILITY and REACTIVITY

10.1 STABILITY: This is a stable material

10.2 HAZARDOUS POLYMERIZATION: Will not occur.

10.3 HAZARDOUS DECOMPOSITION PRODUCTS: None

10.4 INCOMPATIBILITY: Acids will cause the release of heat. Sodium hydroxide solution is not compatible with zinc, aluminum or their alloys (i.e. galvanized metals, etc.). These materials of construction should not be used in handling systems or storage containers for this product. (SEE Section 7.2, Storage)

Section 11: TOXICOLOGICAL INFORMATION

11.1 ORAL: Data not available

11.2 DERMAL: LD_{50}: 1350 mg/kg (rabbit)

11.3 INHALATION: Not available

11.4 CHRONIC/CARCINOGENICITY: No evidence available

11.5 TERATOLOGY: Data not available

11.6 REPRODUCTION: Data not available

11.7 MUTAGENICITY: Data not available

Section 12: ECOLOGICAL INFORMATION

None available

Section 13: DISPOSAL CONSIDERATIONS

If released to the environment for other than its intended purpose, this product pH will be high enough to meet the definition of a corrosive waste, D002. DO NOT ALLOW into any sewers, on the ground, or into any body of water.

Section 14: TRANSPORT INFORMATION

14.1 DOT Shipping Name:	Sodium hydroxide solution
14.2 DOT Hazard Class:	8
14.3 UN/NA Number:	UN1824
14.4 Packing Group:	II
14.5 DOT Placard:	Corrosive
14.6 DOT Label(s):	Corrosive
14.7 IMO Shipping Name:	Sodium hydroxide solution
14.8 RQ (Reportable Quantity):	1,000 lbs (454 Kg) 100% basis
14.9 RR STCC Number:	

Section 15: REGULATORY INFORMATION

15.1 OSHA:		This product is listed as a hazardous material under criteria of the Federal OSHA Hazard Communication Standard, 29 CFR 1910.1200.		
15.2 SARA TITLE III:	a.	**EHS** (Extremely Hazardous Substance) List:		No
	b.	Section 311/312, (Tier I,II) Categories:	Immediate (acute)	Yes
			Fire	No
			Sudden release	No
			Reactivity	Yes
			Delayed (chronic)	No
	c.	Section 313 (Toxic Release Report-Form R):		No
	d.	**TPQ** (Threshold Planning Quantity):		No
15.3 CERCLA/SUPERFUND:		RQ (Reportable Quantity)		1,000 lbs (454 Kg)
15.4 TSCA (Toxic Substance Control Act) Inventory List:				Yes
15.5 RCRA (Resource Conservation and Recovery Act) Status:				Yes (See Section 13)
15.6 WHMIS (Canada) Hazard Classification:				E
15.7 DOT Hazardous Material: (See Section 14)				Yes
15.8 CAA Hazardous Air Pollutant (HAP)				No

Section 16: OTHER INFORMATION

REVISIONS: The MSDS was formatted to comply with ANSI Standard Z400.1-2004
Revised Logo and Emergency Telephone Number, 02/23/2007.
Reviewed 9/12/10.

THE INFORMATION PUBLISHED IN THIS MATERIAL SAFETY DATA SHEET HAS BEEN COMPILED FROM OUR EXPERIENCE AND OSHA, ANSI, NFPA, DOT, ERG, AND CHRIS. IT IS THE USER'S RESPONSIBILITY TO DETERMINE THE SUITABILITY OF THIS INFORMATION FOR THE ADOPTION OF NECESSARY SAFETY PRECAUTIONS. WE RESERVE THE RIGHT TO REVISE MATERIAL SAFETY DATA SHEETS PERIODICALLY AS NEW INFORMATION BECOMES AVAILABLE.

ACROS ORGANICS

MATERIAL SAFETY DATA SHEET
Sodium thiosulfate

Section 1 - Chemical Product and Company Identification

MSDS Name: Sodium thiosulfate

Catalog Numbers: 20287-0000, 20287-0010, 20287-0025, 20287-0050, 20287-5000

Synonyms:

Company Identification: Acros Organics BVBA
Janssen Pharmaceuticalaan 3a
2440 Geel, Belgium

Company Identification: (USA) Acros Organics
One Reagent Lane
Fair Lawn, NJ 07410

For information in the US, call: 800-ACROS-01

For information in Europe, call: +32 14 57 52 11

Emergency Number, Europe: +32 14 57 52 99

Emergency Number US: 201-796-7100

CHEMTREC Phone Number, US: 800-424-9300

CHEMTREC Phone Number, Europe: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name:	%	EINECS#
7772-98-7	Sodium thiosulfate	98.5%	231-867-5

Hazard Symbols: None listed

Risk Phrases: None listed

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Not available

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation. May be harmful if absorbed through the skin.

Ingestion: May cause irritation of the digestive tract. May be harmful if swallowed.

Inhalation: May cause respiratory tract irritation. May be harmful if inhaled.

Chronic: Prolonged or repeated skin contact may cause dermatitis.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Get medical aid. Wash mouth out with water.

Inhalation: Remove from exposure and move to fresh air immediately. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Substance is noncombustible.

Extinguishing Media: Use extinguishing media most appropriate for the surrounding fire.

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Avoid breathing dust, vapor, mist, or gas. Avoid contact with skin and eyes. Avoid ingestion and inhalation.

Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls:

Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

CAS# 7772-98-7:

Personal Protective Equipment

Eyes: Wear chemical splash goggles.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Color: white

Odor: odorless

pH: 6.0-8.5 (5% aq. sol. 20°C)

Vapor Pressure: Not available

Viscosity: Not available

Boiling Point: 100 deg C (212.00°F)

Freezing/Melting Point: 48 deg C (118.40°F)

Autoignition Temperature: Not available

Flash Point: Not available

Explosion Limits: Lower: Not available

Explosion Limits: Upper: Not available
Decomposition Temperature: Not available
Solubility in water: 500 g/l(20°C)
Specific Gravity/Density: 1.660
Molecular Formula: Na2O3S2
Molecular Weight: 158.1

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: High temperatures, incompatible materials, light, exposure to moist air or water.

Incompatibilities with Other Materials Strong oxidizing agents, strong oxidizing agents, acids, chlorates, permanganates, silver salts, mercury, metal nitrates, sodium nitrite, iodine.

Hazardous Decomposition Products Carbon monoxide, oxides of sulfur, carbon dioxide, sodium oxide.

Hazardous Polymerization Will not occur.

Section 11 - Toxicological Information

RTECS#: CAS# 7772-98-7: XN6476000

LD50/LC50: RTECS: Not available. Other: Oral, rat : LD50 = >5000mg/kg

Carcinogenicity: Sodium thiosulfate - Not listed as a carcinogen by ACGIH, IARC, NTP, or CA Prop 65.

Other: See actual entry in RTECS for complete information. The toxicological properties have not been fully investigated.

Section 12 - Ecological Information

Ecotoxicity: Fish: Mosquito Fish: 24000mg/l; 96h; .

Other: Do not empty into drains.
log Pow : -4.35

Section 13 - Disposal Considerations

Dispose of in a manner consistent with federal, state, and local regulations.

Section 14 - Transport Information

	IATA	IMO	RID/ADR
Shipping Name:	Not regulated.	Not regulated.	Not regulated.
Hazard Class:			
UN Number:			
Packing Group:			

Section 15 - Regulatory Information

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:Not available

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 7772-98-7: 0

Canada

CAS# 7772-98-7 is listed on Canada's DSL List

US Federal

TSCA

CAS# 7772-98-7 is listed on the TSCA Inventory.

Section 16 - Other Information

MSDS Creation Date: 7/16/1996

Revision #1 Date 2/20/2008

Revisions were made in Sections: 1, 2, 3, 4, 5, 6, 7, 8, 9, 11,

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantibility or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall the company be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential, or exemplary damages howsoever arising, even if the company has been advised of the possibility of such damages.

ODJELJAK 1.: Identifikacija tvari/pripravka i podaci o tvrtki/poduzeću

1.1 Identifikacijska oznaka proizvoda

Identifikacija tvari	**sumporna kiselina**
Broj artikla	9316
Broj registracije (REACH)	01-2119458838-20-xxxx
Indeksni br.	016-020-00-8
EC broj	231-639-5
CAS broj	7664-93-9

1.2 Relevantne identificirane namjene tvari ili smjese i namjene koje se ne preporučuju

Identificirane namjene: laboratorijska kemikalija

1.3 Podaci o dobavljaču koji isporučuje sigurnosno-tehnički list

Carl Roth GmbH + Co KG
Schoemperlenstr. 3-5
D-76185 Karlsruhe
Njemačka

Telefon: +49 (0) 721 - 56 06 0
Telefaks: +49 (0) 721 - 56 06 149
elektronička pošta: sicherheit@carlroth.de
Internetska stranica: www.carlroth.de

Stručna osoba koja je odgovorna za sigurnosno-tehnički list : Department Health, Safety and Environment

elektronička pošta (stručna osoba) : sicherheit@carlroth.de

1.4 Broj telefona za izvanredna stanja

Informacijske službe za izvanredna stanja **Poison Centre Munich: +49/(0)89 19240**

ODJELJAK 2.: Identifikacija opasnosti

2.1 Razvrstavanje tvari ili smjese

Razvrstavanje prema Uredbi (EZ) br. 1272/2008 (CLP)

Razvrstavanje sukladno GHS

Odjeljak	Razred opasnosti	Razred i kategorija opasnosti	Oznaka upozorenja
2.16	nagrizajuće za metale	(Met. Corr. 1)	H290
3.2	nagrizajuće/nadražujuće za kožu	(Skin Corr. 1A)	H314
3.3	teška ozljeda oka/nadražujuće za oko	(Eye Dam. 1)	H318

Napomene
Za puni tekst oznaka upozorenja i EU-oznaka upozorenja: vidjeti ODJELJAK 16.

2.2 Elementi označivanja

Označavanje sukladno Uredbi (EZ) br. 1272/2008 (CLP)

Oznaka opasnosti **Opasnost**

Piktogrami

Oznake upozorenja

H290	Može nagrizati metale.
H314	Uzrokuje teške opekline kože i ozljede oka.

Oznake obavijesti

Oznake obavijesti – sprečavanje

P280	Nositi zaštitne rukavice/zaštitno odijelo/zaštitu za oči/zaštitu za lice.

Oznake obavijesti – postupanje

P301+P330+P331	AKO SE PROGUTA: isprati usta. NE izazivati povraćanje.
P303+P361+P353	U SLUČAJU DODIRA S KOŽOM (ili kosom): Odmah skinuti svu zagađenu odjeću. Isprati kožu vodom/ tuširanjem.
P305+P351+P338	AKO DOĐE U DODIR S OČIMA: oprezno ispirati vodom nekoliko minuta. Ukloniti kontaktne leće ako ih nosite i ako se one lako uklanjaju. Nastaviti ispiranje.
P310	Odmah nazvati CENTAR ZA KONTROLU OTROVANJA/liječnika.

Označavanje pakiranja čiji sadržaj ne prelazi 125 ml
Oznaka opasnosti: **Opasnost**
Simbol(i)

H314	Uzrokuje teške opekline kože i ozljede oka.
P280	Nositi zaštitne rukavice/zaštitno odijelo/zaštitu za oči/zaštitu za lice.
P301+P330+P331	AKO SE PROGUTA: isprati usta. NE izazivati povraćanje.
P303+P361+P353	U SLUČAJU DODIRA S KOŽOM (ili kosom): Odmah skinuti svu zagađenu odjeću. Isprati kožu vodom/ tuširanjem.
P305+P351+P338	AKO DOĐE U DODIR S OČIMA: oprezno ispirati vodom nekoliko minuta. Ukloniti kontaktne leće ako ih nosite i ako se one lako uklanjaju. Nastaviti ispiranje.
P310	Odmah nazvati CENTAR ZA KONTROLU OTROVANJA/liječnika.

2.3 Ostale opasnosti

Nema dodatnih informacija.

ODJELJAK 3.: Sastav/informacije o sastojcima

3.1 Tvari

Naziv tvari	sumporna kiselina
Indeksni br.	016-020-00-8
Broj registracije (REACH)	01-2119458838-20-xxxx
EC broj	231-639-5
CAS broj	7664-93-9
Molekularna formula	H_2SO_4
Molarna masa	98,07 $^{g}/_{mol}$

ODJELJAK 4.: Mjere prve pomoći

4.1 Opis mjera prve pomoći

Opće napomene

Odmah skinuti svu zagađenu odjeću. Samozaštita osobe koja pruža prvu pomoć.

Nakon udisanja

Osigurati svježi zrak. U nedoumici ili ako simptomi ne prolaze, zatražiti savjet liječnika.

Nakon dodira s kožom

Nakon dodira s kožom odmah oprati s puno vode. Potrebna je hitna liječnička intervencija jer nezbrinute ozljede od kiseline uzrokuju teško izlječive rane.

Nakon dodira s očima

Ako dođe u dodir s očima, odmah uz otvorene kapke ispirati tekućom vodom 10 do 15 min. i konzultirati oftalmologa. Zaštititi nepovrijeđeno oko.

Nakon gutanja

Odmah isprati usta i popiti veću količinu vode. Odmah kontaktirati liječnika. Ako se proguta, postoji opasnost od perforacije jednjaka i želuca (jako nagrizanje).

4.2 Najvažniji simptomi i učinci, akutni i odgođeni

Nagrizanje, Gastroenterološke smetnje, Kašalj, Može uzrokovati sljepoću, Perforacija želuca, Opasnost od teških ozljeda očiju, Povraćanje, Dispneja (smetnje pri disanju)

4.3 Navod o slučaju potrebe za hitnom liječničkom pomoći i posebnom obradom

Liječenje simptoma.

ODJELJAK 5.: Mjere gašenja požara

5.1 Sredstva za gašenje

Prikladna sredstva za gašenje

postupke pri gašenju prilagoditi okolišu
raspršeni mlaz vode, pjena, suhi prah za gašenje požara, ugljikov dioksid (CO2)

Neprikladna sredstva za gašenje

voda u punom mlazu

5.2 Posebne opasnosti koje proizlaze iz tvari ili smjese

Negorivo.

Opasni proizvodi raspada

u slučaju požara mogu nastati: sumporovi oksidi (SOx)

5.3 Savjeti za gasitelje požara

Gasiti vatru uz odgovarajući oprez s primjerene udaljenosti. Nositi samostalni uređaj za disanje. Nositi zaštitno odijelo otporno na kemikalije.

ODJELJAK 6.: Mjere kod slučajnog ispuštanja

6.1 Osobne mjere opreza, zaštitna oprema i postupci za izvanredna stanja

Za osobe koje se ne ubrajaju u interventno osoblje

Osobita opasnost od poskliznuća zbog iscurenog/prolivenog proizvoda. Nošenje prikladne zaštitne opreme (uključujući osobnu zaštitnu opremu iz odjeljka 8. sigurnosno-tehničkog lista) kako bi se spriječilo onečišćenje kože, očiju i osobne odjeće. Izbjeći kontakt s kožom, očima i odjećom. Ne udisati pare/aerosol.

6.2 Mjere zaštite okoliša

Držati podalje od kanalizacijskih odvoda, površinskih i podzemnih voda. Produkt je kiselina. U pravilu je potrebna neutralizacija prije uvođenja otpadnih voda u uređaj za pročišćavanje.

6.3 Metode i materijal za sprečavanje širenja i čišćenje

Savjeti kako spriječiti širenje prolivenog materijala

Prekrivanje odvoda.

Savjeti kako očistiti proliveni materijal

Ukloniti materijalima koji vežu tekućinu (pijesak, infuzorijska zemlja, vezivo za kiseline, univerzalno vezivo).

Ostale informacije u vezi s izlijevanjem i ispuštanjem

Zbrinjavati u odgovarajućim spremnicima.

Uputa na druge odjeljke

Opasni proizvodi izgaranja: vidjeti odjeljak 5.Osobna zaštitna oprema: vidjeti odjeljak 8.Inkompatibilni materijali: vidjeti odjeljak 10.Zbrinjavanje: vidjeti odjeljak 13.

ODJELJAK 7.: Rukovanje i skladištenje

7.1 Mjere opreza za sigurno rukovanje

Pri razrijeđivanju/otapanju uvijek najprije prirediti vodu a proizvod lagano umiješati. Pažljivo rukovati i pažljivo otvarati spremnike.

Savjeti o općoj higijeni na radnom mjestu

Prije odmora i na kraju rada oprati ruke. Skladištiti odvojeno od hrane, pića i stočne hrane.

7.2 Uvjeti sigurnog skladištenja, uzimajući u obzir moguće inkompatibilnosti

Čuvati u dobro zatvorenom spremniku.

Inkompatibilne tvari i smjese

Uzeti u obzir naputke o kombiniranom skladištenju.

Uzimanje ostalih savjeta u obzir

• Uvijeti u vezi s prozračivanjem

Koristiti lokalnu ispušnu ventilaciju i centralni sustav ventilacije.

• Poseban oblik skladišnih prostorija odnosno posuda

Preporučena temperatura skladištenja: 15 - 25 °C.

7.3 Posebna krajnja uporaba ili uporabe

Nema informacija.

ODJELJAK 8.: Nadzor nad izloženošću/osobna zaštita

8.1 Nadzorni parametri

Nacionalne granične vrijednosti

Granične vrijednosti profesionalne izloženosti (granične vrijednosti izlaganja na radnom mjestu)

Zemlja/država	Naziv tvari	CAS br.	Napomena	Identifikacijska oznaka	GVI [mg/m³]	KGVI [mg/m³]	Izvor
EU	sumporna kiselina	7664-93-9	t mist	IOELV	0,05		2009/161/EU
HR	sumporna kiselina	7664-93-9		GVI	0,05		Narodne novine

Napomena

GVI	Vremenski ponderirani prosjek (granična vrijednost dugotrajnog izlaganja): izmjereno ili izračunano u odnosu na referentno razdoblje od 8 sati vremenski ponderiranog prosjeka (TWA)
KGVI	Granica za kratkotrajnu izloženost: granična vrijednost koja se ne bi smjela prekoračiti pri izlaganju i koja se odnosi na 15-minutno razdoblje, osim ako nije definirano drugačije
mist	Kao maglice
t	Torakalna frakcija

Relevantne DNEL/DMEL/PNEC i ostale granične vrijednosti

• vrijednosti relevantne za ljudsko zdravlje

Završna točka	Granična vrijednost	Minimalni stupanj zaštite, put izlaganja	Koristi se u	Vrijeme izlaganja
DNEL	0,1 mg/m³	čovjek, udisanjem	zaposlenik (industrija)	akutno - lokalno djelovanje
DNEL	0,05 mg/m³	čovjek, udisanjem	zaposlenik (industrija)	kronično - lokalno djelovanje

• vrijednosti relevantne za okoliš

Završna točka	Granična vrijednost	Segment okoliša	Vrijeme izlaganja
PNEC	0,0025 mg/l	slatka voda	kratkoročno (jednokratno)
PNEC	0,00025 mg/l	morska voda	kratkoročno (jednokratno)
PNEC	8,8 mg/l	postrojenje za pročišćavanje otpadnih voda (STP)	kratkoročno (jednokratno)
PNEC	0,002 mg/kg	slatkovodni sediment	kratkoročno (jednokratno)
PNEC	0,002 mg/kg	morski sediment	kratkoročno (jednokratno)

8.2 Nadzor nad izloženošću

Osobne mjere zaštite (osobna zaštitna oprema)

Zaštita za oči i lice

Koristiti zaštitne naočale s bočnom zaštitom. Nositi zaštitu za lice.

Zaštita kože

• zaštita ruku

Nositi odgovarajuće zaštitne rukavice. Prikladne su rukavice za zaštitu od kemikalija ispitane prema EN 374. Prije upotrebe provjeriti zabrtvljenost/nepropusnost. Preporuča se zajedno s dobavljačem rukavica provjeriti otpornost na kemikalije gore navedenih zaštitnih rukavica za posebne namjene.

• vrsta materijala

FMK: fluorov elastomer, fluorov kaučuk

• debljina materijala

0,7mm.

• vrijeme probijanja materijala rukavica

>480 minuta (stupanj permeacije: 6)

• ostale mjere za zaštitu

Uzeti razdoblja oporavka za regeneraciju kože. Preporuča se primjena preventivnih mjera zaštite kože (zaštitne kreme/masti).

Zaštita dišnih puteva

Zaštita dišnih puteva je potrebna pri: Pojava aerosola ili magle. P2 (filtrira najmanje 94 % lebdećih čestica, oznaka boje: bijela).
Držati se ograničenja vremena nošenja prema GefStoffV vezano za pravila o upotrebi respiratorne zaštite (BGR 190).

Ograničavanje i nadzor izloženosti okoliša

Držati podalje od kanalizacijskih odvoda, površinskih i podzemnih voda.

ODJELJAK 9.: Fizikalna i kemijska svojstva

9.1 Informacije o osnovnim fizikalnim i kemijskim svojstvima

Izgled

Agregatno stanje	tekuće (tekućina)
Boja	bezbojna
Miris	bez mirisa
Prag mirisa	Podaci nisu dostupni

Ostali fizikalni i kemijski parametri

pH vrijednost	<1 (20 °C)
Talište/ledište	-15 °C
Početna točka vrenja i područje vrenja	295 - 315 °C
Plamište	nije određeno
Brzina isparavanja	podaci nisu dostupni
Zapaljivost (kruta tvar, plin)	nije relevantno (tekućina)
Granice eksplozivnosti	
• donja granica eksplozivnosti (DGE)	ta informacija nije dostupna
• gornja granica eksplozivnosti (GGE)	ta informacija nije dostupna
Granice eksplozivnosti koncentracije prašine u zraku	nije relevantno
Tlak pare	<0,01 hPa na 20 °C
Gustoća	1,84 $^{g}/_{cm^3}$ na 20 °C
Gustoća pare	Ta informacija nije dostupna.
Gustoća u rasutom stanju	Nije primjenjivo
Relativna gustoća	Informacije o ovom svojstvu nisu raspoložive.
Topljivost(i)	
Topljivost u vodi	topljivo , miješa se u bilo kojem omjeru
Koeficijent raspodjele	
n-oktanol/voda	Ta informacija nije dostupna.
Temperatura samozapaljenja	Informacije o ovom svojstvu nisu raspoložive.
Temperatura raspada	338 °C
Viskoznost	
• dinamička viskoznost	26,9 mPa s na 20 °C
Eksplozivna svojstva	ništa
Oksidirajuća svojstva	ništa

9.2 Ostale informacije

Nema dodatnih informacija.

ODJELJAK 10.: Stabilnost i reaktivnost

10.1 Reaktivnost

nagrizajuće za metale, jaki oksidansi

10.2 Kemijska stabilnost

Materijal je stabilan u normalnim uvjetima okoline te u očekivanim uvjetima tlaka i temperature skladištenja i rukovanja.

10.3 Mogućnost opasnih reakcija

Burno reagira s: Alkalijski metali, Karbid, Zemnoalkalijski metal, Peroksidi, Fosfor-oksidi, Perklorati, Amonijak, Metali, Organske tvari

10.4 Uvjeti koje treba izbjegavati

Do razlaganja dolazi od temperature: 338 °C.

10.5 Inkompatibilni materijali

različita metali

10.6 Opasni proizvodi raspadanja

Opasni proizvodi izgaranja: vidjeti odjeljak 5.

ODJELJAK 11.: Toksikološke informacije

11.1 Informacije o toksikološkim učincima

Akutna toksičnost

Put izlaganja	Završna točka	Vrijednost	Vrsta	Izvor
oralno	LD50	2140 $^{mg}/_{kg}$	štakor	ECHA

Nagrizanje/iritacija kože

Izaziva teške opekotine.

Teška ozljeda oka/nadražujuće za oko

Uzrokuje teške ozljede oka.

Preosjetljivost dišnih puteva ili kože

Ne razvrstava se kao tvar ili smjesa koja izaziva preosjetljivost dišnog sustava ili kože.

Sažetak procjene CMR svojstava

Ne razvrstava se kao tvar mutagenog učinka na zametne stanice, karcinogeno niti kao reproduktivno toksično

• Specifična toksičnost za ciljni organ pri jednokratnom izlaganju

Ne razvrstava se kao specifično toksično za ciljane organe (jednokratno izlaganje).

• Specifična toksičnost za ciljni organ pri ponovljenom izlaganju

Ne razvrstava se kao specifično toksično za ciljane organe (ponavljano izlaganje).

Opasnost od aspiracije
Ne razvrstava se kao tvar ili smjesa koja predstavlja opasnost od aspiracije.

Simptomi u vezi s fizikalnim, kemijskim i toksikološkim svojstvima

- **Ako se proguta**

povraćanje, Ako se proguta, postoji opasnost od perforacije jednjaka i želuca (jako nagrizanje), Grčevi

- **Ako dođe u dodir s očima**

izaziva opekotine, Uzrokuje teške ozljede oka, može uzrokovati sljepoću

- **Ako se udahne**

nagrizajuće za dišni sustav

- **Ako dođe u dodir s kožom**

izaziva teške opekotine, uzrokuje rane koje teško zarastaju

Ostale informacije
Ništa.

ODJELJAK 12.: Ekološke informacije

12.1 Toksičnost
sukladno Uredbi 1272/2008/EZ: Ne razvrstava se kao opasno za vodeni okoliš.

(Akutna) toksičnost u vodi

Završna točka	Vrijednost	Vrsta	Izvor	Vrijeme izlaganja
EC50	>100 mg/l	vodeni beskralježnjaci	ECHA	48 sati

(Kronična) toksičnost u vodi

Završna točka	Vrijednost	Vrsta	Izvor	Vrijeme izlaganja
NOEC	0,025 mg/l	riba	ECHA	65 d

12.2 Proces razgradnje
Metode određivanja biološke razgradivosti ne mogu se primijeniti na anorganske supstance.

12.3 Bioakumulacijski potencijal
Podaci nisu raspoloživi.

12.4 Pokretljivost u tlu
Podaci nisu raspoloživi.

12.5 Rezultati ocjenjivanja svojstava PBT i vPvB
Podaci nisu raspoloživi.

12.6 Ostali štetni učinci
Malo štetno za vodu.

ODJELJAK 13.: Zbrinjavanje otpada

13.1 Metode obrade otpada

Ostaci kemikalije i spremnici moraju biti odloženi kao opasan otpad. Odložiti sadržaj/spremnik u skladu s lokalnim/regionalnim/nacionalnim/međunarodnimpropisima (navesti).

Informacije relevantne za izlijevanje u kanalizaciju

Ne izlijevati u kanalizaciju.

Obrada otpadnih spremnika/ambalaže

Riječ je o opasnom otpadu; dozvoljena uporaba samo one ambalaže koja je odobrena (npr. prema ADR).

13.2 Relevantni zakonski propisi o otpadu

Pridruživanje identifikacijskih brojeva otpada treba provesti stručno i primjereno procesu prema EAKV.

13.3 Napomene

Otpad se razvrstava tako da ih postrojenja za upravljanje otpadom mogu obrađivati odvojeno. Molimo uzeti u obzir važeće nacionalne i regionalne propise.

ODJELJAK 14.: Informacije o prijevozu

14.1	UN broj	**1830**
14.2	Pravilno otpremno ime prema UN-u	**SUMPORNA KISELINA**
	Opasni sastojci	Sumporna kiselina
14.3	Razred(i) opasnosti pri prijevozu	
	Razred	8 (nagrizajuće tvari)
14.4	Skupina pakiranja	II (tvar koja predstavlja umjerenu opasnost)
14.5	Opasnosti za okoliš	ništa (nije opasno za okoliš prema Propisima o opasnom teretu)

14.6 Posebne mjere opreza za korisnika

Unutar pogona se treba pridržavati propisa o opasnim robama (ADR).

14.7 Prijevoz u razlivenom stanju u skladu s Prilogom II. Konvenciji MARPOL i Kodeksom IBC

Teret nije namijenjen prijevozu u rasutom stanju.

14.8 Informacije o pojedinim Oglednim propisima UN-a

• Prijevoz opasnih roba cestovnim, željezničkim i unutarnjim vodenim putem (ADR/RID/ADN)

UN broj	1830
Ispravno otpremno ime	SUMPORNA KISELINA
Pojedinosti u prijevoznoj ispravi	UN1830, SUMPORNA KISELINA, 8, II, (E)
Razred	8
Šifra razvrstavanja	C1
Skupina pakiranja	II
Listica(e) opasnosti	8

Dozvoljene količine (EQ)	E2
Ograničene količine (LQ)	1 L
Kategorija prijevoza	2
Kod ograničenja za tunele	E
Identifikacijski br. opasnosti	80

• Međunarodni kodeks za prijevoz opasnih tereta pomorskim putem (IMDG)

UN broj	1830
Ispravno otpremno ime	SULPHURIC ACID
Pojedinosti u izjavi pošiljatelja (shipper's declaration)	UN1830, SUMPORNA KISELINA, 8, II
Razred	8
Skupina pakiranja	II
Listica(e) opasnosti	8

Posebni propisi	-
Dozvoljene količine (EQ)	E2
Ograničene količine (LQ)	1 L
EmS	F-A, S-B
Kategorije slaganja tereta (stowage category)	C
Segregacijska skupina	1 - Kiseline

ODJELJAK 15.: Informacije o propisima

15.1 Propisi u području sigurnosti, zdravlja i okoliša/posebno zakonodavstvo za tvar ili smjesu

Relevantni propisi Europske unije (EU)

• Uredba 649/2012/EU o izvozu i uvozu opasnih kemikalija (PIC)
Nije navedeno.

• Uredba 1005/2009/EZ o tvarima koje oštećuju ozonski sloj (ODS)
Nije navedeno.

• Uredba 850/2004/EZ o postojanim organskim onečišćujućim tvarima (POP)

Nije navedeno.

• Ograničenja u skladu s REACH, Prilog XVII.

nije navedeno

• Popis tvari koje podliježu autorizaciji (REACH, Prilog XIV.)

nije navedeno

Direktiva 2011/65/EU o ograničenju uporabe određenih opasnih tvari u električnoj i elektroničkoj opremi (RoHS) - prilog II

nije navedeno

Uredba 166/2006/EZ o uspostavi Europskog registra ispuštanja i prijenosa zagađujućih tvari (PRTR)

nije navedeno

Direktiva 2000/60/EZ o uspostavi okvira za djelovanje Zajednice u području vodne politike (WFD)

nije navedeno

Nacionalni popisi

Tvar je navedena u sljedećim nacionalnim popisima:

- EINECS/ELINCS/NLP (Europa)
- REACH (Europa)

15.2 Procjena kemijske sigurnosti

Za ovu je tvar provedena procjena kemijske sigurnosti.

ODJELJAK 16.: Ostale informacije

Kratice i akronimi

Krat.	Opisi korištenih kratica
2009/161/EU	Direktiva Komisije kojom se utvrđuje treći popis indikativnih graničnih vrijednosti profesionalne izloženosti u provedbi Direktive Vijeća 98/24/EZ i kojom se izmjenjuje i dopunjuje Direktiva Komisije 2000/39/EZ
ADN	Accord européen relatif au transport international des marchandises dangereuses par voies de navigation intérieures (Europski sporazum o međunarodnom prijevozu opasne robe unutarnjim plovnim putovima)
ADR	Accord européen relatif au transport international des marchandises dangereuses par route (Europski sporazum o međunarodnom prijevozu opasnih tvari u cestovnom prometu)
CAS	Chemical Abstracts Service (sveobuhvatna baza podataka kemijskih tvari, spojeva i njihovih registracijskih CAS brojeva)
CLP	Uredba (EZ) br. 1272/2008 o razvrstavanju, označavanju i pakiranju tvari i smjesa
CMR	Carcinogenic, Mutagenic or toxic for Reproduction (karcinogeno, mutageno ili reproduktivno toksično)
DMEL	Derived Minimal Effect Level (izvedena razina izloženosti s minimanim učinkom)
DNEL	Derived No-Effect Level (izvedena razina izloženosti bez učinka)
EINECS	European Inventory of Existing Comercial Chemical Substances (Europski popis postojećih komercijalnih kemijskih tvari)
ELINCS	European List of Notified Chemical Substances (Europski popis prijavljenih kemijskih tvari)
EmS	Emergency Schedule (plan za hitne slučajeve)
GHS	"Globally Harmonized System of Classification and Labelling of Chemicals" „Globalni harmonizirani sustav", kojeg su razvili Ujedinjeni narodi
IMDG	International Maritime Dangerous Goods Code (Međunarodni kodeks za prijevoz opasnih tereta pomorskim putem)
indeksni br.	indeksni broj je identifikacijska oznaka dodijeljena tvari u Dijelu 3. Priloga VI. Uredbe (EZ) br. 1272/2008

Krat.	Opisi korištenih kratica
MARPOL	Međunarodna konvencija o sprečavanju onečišćenja s brodova (skraćenica od „Marine Pollutant")
Narodne novine	Pravilnik o graničnim vrijednostima izloženosti opasnim tvarima pri radu i o biološkim graničnim vrijednostima
NLP	No-Longer Polymer (tvari koje više nisu polimeri)
PBT	postojan, bioakumulativan i toksičan
PNEC	Predicted No-Effect Concentration (predviđena koncentracija bez učinka)
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals (registracija, evaluacija, autorizacija i ograničavanje kemikalija)
RID	Règlement concernant le transport International ferroviaire des marchandises Dangereuses (Pravilnik o međunarodnom prijevozu opasnih tvari željeznicom)
vPvB	very Persistent and very Bioaccumulative (vrlo postojan i vrlo bioakumulativan)

Ključna literatura i izvori podataka

- Uredba (EZ) br. 1907/2006 (REACH), izmjenjena Uredbom Komisije (EU) br. 2015/830
- Uredba (EZ) br. 1272/2008 (CLP, EU GHS)

Popis relevantnih oznaka (broj i puni tekst kao što je navedeno u poglavlju 2 i 3)

Šifra	Tekst
H290	može nagrizati metale
H314	uzrokuje teške opekline kože i ozljede oka
H318	uzrokuje teške ozljede oka

Izjava o odricanju od odgovornosti

Podatci na sigurnosnom listu odgovaraju našim saznanjima o sigurnosnim mjerama na dan tiskanja. Ove informacije će Vam dati uporište za sigurno rukovanje proizvodom navedenim na ovom sigurnosnom listu pri skladištenju, obradi, transportu i zbrinjavanju. Podatci ne vrijede za druge proizvode. Ako je proizvod pomiješan s drugim materijalima, ako se miješa ili prerađuje, Ili se obradi, podatci iz sigurnosnog lista ne mogu se prenositi na tako pripremljeni novi materijal, osim ako se u tom slučaju ne pokaže nešto značajno drukčije.

kemika
dioničko društvo za proizvodnju kemijskih proizvoda

1. NAZIV PROIZVODA / PODACI O PROIZVOĐAČU

1.1	Naziv proizvoda:	**KLORIDNA KISELINA, min. 36,5 %, puriss.**
1.2	Kataloški broj:	18051
1.3	Proizvođač:	Kemika d.d., Heinzelova 53, Zagreb, Hrvatska
1.4	Telefon za informacije:	01 24 41 400
1.5	Telefon u slučaju opasnosti:	01 24 41 400

2. IDENTIFIKACIJA I INFORMACIJE O SASTAVU

2.1 Sastav:

Naziv	CAS	Sadržaj	Formula	Mr
Klorovodik	7647-01-0	min. 36,5 %	HCl	36,46
Voda	7732-18-5	maks. 63,55 %	H_2O	18,02

2.2	Sinonimi:	Solna kiselina, Otopina klorovodika
2.3	EC:	017-002-0-X
2.4	EINECS:	231-595-7

3. PODACI O OPASNOSTI

3.1 Oznaka opasnosti: C - Nagrizajuće!

3.2 Upozorenja:

Oprez! Izaziva opekotine. Nadražuje oči i dišne organe. Opasno ako se proguta.

4. PRVA POMOĆ

4.1 U slučaju dodira s kožom:

Zagađenu odjeću odmah skinuti. Mjesto dodira s kožom temeljito oprati vodom i sapunom. Zatražiti pomoć liječnika.

4.2 U slučaju dodira s očima:

Odmah ispirati sa nježnim ali obilnim mlazom vode najmanje 15 min. odižući povremeno gornje i donje kapke. Zatražiti pomoć liječnika.

4.3 Ako se udahne:

Izvesti unesrećenu osobu na svježi zrak. Ako ne diše, dati umjetno disanje. Ako je disanje otežano, dati kisik. Zatražiti pomoć liječnika.

4.4 Ako se proguta:

Ne izazivati povraćanje (opasnost od perforacija). Piti veće količine vode. Ne piti sodu bikarbonu, može se piti mlijeko ili tučena bjelanca. Nikada ne davati ništa oralnim putem osobi bez svijesti. Zatražiti pomoć liječnika.

5. MJERE U SLUČAJU POŽARA

5.1 Pogodna sredstva za gašenje:

Sredstvo za gašenje prilagoditi okolini. Za hlađenje spremnika u zoni opasnosti koristiti raspršenu vodu.

5.2 Zapaljivost:

Ne spada u požarno opasne tvari. U dodiru s metalima razvija se zapaljivi plin vodik. Burno reagira s vodom.

5.3 Eksplozivnost:

Ne spada u eksplozivne tvari.

5.4 Posebna upozorenja:

U slučaju požara svo osoblje u zoni opasnosti mora biti opremljeno potpunom zaštitnom opremom.

6. MJERE U SLUČAJU NEZGODE

6.1. Zaštita osoba:

Isključiti sve izvore topline i paljenja i napustiti prostoriju. U prostoriju smije ući samo osoblje koje će izvršiti dekontaminaciju, opremljeno potrebnom zaštitnom opremom.

6.2 Mjere u slučaju prolijevanja /curenja/ izlaska plina:

Prolivenu tekućinu neutralizirati sredstvom za neutralizaciju (npr. gašeno vapno ili smjesa jednakih dijelova gašenog vapna i sode), zatim pokupiti i spremiti u dobro zatvoren spremnik. Pri neutralizaciji s navedenom smjesom razvija se ugljik(IV)-oksid pa u prostoriji treba osigurati dobru ventilaciju. Mjesto prlijevanja temeljito oprati. Prozračiti prostoriju.

7. RUKOVANJE I SKLADIŠTENJE

7.1 Rukovanje:

Upotrebljavati propisana zaštitna sredstva.

7.2 Skladištenje:

U dobro zatvorenoj ambalaži, u suhoj, hladnoj i dobro ventiliranoj prostoriji. Zaštititi od fizičkih oštećenja. Čuvati odvojeno od inkompatibilnih tvari. I ispražnjena ambalaža može biti opasna budući da sadrži ostatke kemikalije.

8. KONTROLA IZLOŽENOSTI / ZAŠTITA OSOBA

8.1 Specifični kontrolni parametri: MDK: 7,6 mg/m^3

8.2 Osobna zaštita:

dišnih organa:	u atmosferi koja sadrži manje od 2 vol. % kiselih para i najmanje 16 % kisika može se za kratkotrajnu zaštitu dišnih organa (najdulje 30') upotrijebiti plinska maska s obrazinom i kemijskim filterom za apsorpciju kiselih para. U atmosferi koja sadrži više od 2 vol. % kiselih para ili manje od 16 vol. % kisika, dišne organe treba zaštititi cijevnom maskom ili izolacijskim aparatom za zaštitu disanja s neovisnim dovodom čistog zraka ili kisika.
kože:	zaštitne rukavice i zaštitna odjeća
očiju:	zaštitne naočale

8.3 Radna higijena:
Koristiti sredstva osobne zaštite. Osigurati prikladnu ventilaciju koja smanjuje izloženost na najmanju moguću mjeru.

9. FIZIKALNA I KEMIJSKA SVOJSTVA

9.1	Izgled:	bistra, bezbojna tekućina	
9.2	Miris:	oštar i nadražujući	
9.3	pH-vrijednost (20 °C):	< 1	
9.4	Talište:	-28	°C
9.5	Vrelište:	~ 50	°C
9.6	Tlak para (20°C):	20	hPa
9.7	Gustoća (20°C):	1,18	g/cm^3
9.8	Topljivost u vodi (20°C):	topljivo	

10. STABILNOST I REAKTIVNOST

10.1 Stabilnost:
Stabilan pri pravilnim uvjetima upotrebe i skladištenja.

10.2 Uvjeti koje treba izbjegavati:
Zagrijavanje, inkompatibilne tvari.

10.3 Inkompatibilne tvari:
Aluminij, amini, karbidi, hidridi, alkalni metali, kalij-permanganat, jake baze, soli oksihalogenih kiselina, koncentrirana sulfatna kiselina, semimetalni oksidi, aldehidi, sulfidi, litij-silicid, vinil-metil-eter.

10.4 Opasni raspadni produkti:
Klor, klorovodik.

10.5 Ostale informacije:

11. TOKSIKOLOŠKI PODACI

11.1 Toksičnost: RTECS: MW 4025000

$LC50_{(inhal., štakor)}$: 3124 ppm/1h
$LCLo_{(inhal., čovjek)}$: 1300 ppm/30min.

11.2 Djelovanje na kožu:
Jako nagrizajuće djelovanje. Izaziva opekotine.

11.3 Djelovanje na oči:
Izaziva opekotine.

11.4 Udisanje:
Izaziva oštećenje sluznice.

11.5 Ako se proguta:
Kiselina uzrokuje teške ozljede na sluznicama ustiju, grla i želuca. Može izazvati prestanak cirkulacije

12. EKOLOŠKI PODACI

12.1 Ekotoksično djelovanje:
Otrov za vodene organizme. $LC50_{(Leuciscus\ idus)}$: 862 mg/L (1M otopina).

12.2 Ostale informacije:
Otpadne vode koje sadrže kloridnu kiselinu štetno djeluju na vodu zbog pomaka pH-vrijednosti.

13. ZBRINJAVANJE OTPADA

Generalna rješenja za zbrinjavanje ne postoje i u svakoj državi ona moraju biti u skladu s važećim zakonima. Preporučamo kontaktirati nadležnu ustanovu koja se bavi problematikom odlaganja i uništavanja kemijskog otpada.

14. TRANSPORT

14.1 Kopneni prijevoz:	RID/ADR: 8/5b
14.2 Zračni prijevoz:	ICAO/IATA: 8 II UN 1789 PAX: 809 CAO: 813
14.3 Transport morem:	IMDG: 8/II UN 1789

15. PROPISI O OZNAČAVANJU

15.1 Simbol opasnosti:	C - Nagrizajuće!
15.2 Upozorenje "R":	34-36
15.3 Obavjest "S":	26-36/37/39-45

15.4 Grupa zapaljivosti:	
15.5 Grupa otrovnosti:	II; CH-Giftkl. 2

16. OSTALE INFORMACIJE

Obavijesti sadržane u ovome obliku osnivaju se na našem sadašnjem saznanju. Iste ne predstavljaju garanciju kvalitete opisanog proizvoda.

ODJELJAK 1.: Identifikacija tvari/smjese i podaci o tvrtki/poduzeću

1.1. Identifikacija proizvoda

Trgovački naziv proizvoda: Kalijev klorid K_2O 60 granulirani
Šifra proizvoda: 2606438

Naziv tvari: kalijev klorid
EC broj: 231-211-8, **CAS broj**: 7447-40-7
REACH registracijski broj: Nije primjenjivo – tvar je izuzeta od REACH registracije sukladno Dodatku V Uredbe (EZ) br. 1907/2006.

EZ GNOJIVO
Tip EZ gnojiva: Anorgansko jednostavno gnojivo s primarnim hranjivim tvarima. Kalijevo gnojivo.
Oznaka tipa: Kalijev korid.

1.2. Odgovarajuće identificirane namjene tvari ili smjese i namjene koje se ne preporučuju

Identificirane namjene: Površinsko raspršivanje ili unošenje u tlo na otvorenim poljima i u staklenicima. Gnojidba javnih površina: parkovi, travnjaci, sportski tereni, golf tereni.
Namjene koje se ne preporučuju: Nema.

1.3. Podaci o dobavljaču koji isporučuje sigurnosno-tehnički list

Proizvođač: Petrokemija d.d., tvornica gnojiva, www.petrokemija.hr
Adresa: Aleja Vukovar 4, 44320 Kutina, Hrvatska Telefon: 044 647 122
Elektronička pošta osobe odgovorne za STL: safety.data.sheet@petrokemija.hr

1.4. Broj telefona za izvanredna stanja

Jedinstveni europski broj za hitne službe: 112
HZTA broj za slučaj nesreća s kemikalijama: 098 405 636

ODJELJAK 2.: Identifikacija opasnosti

2.1. Razvrstavanje tvari ili smjese

Razvrstavanje prema Uredbi (EZ) br. 1272/2008 [CLP]:
Ovaj proizvod nije razvrstan niti u jednom razredu opasnosti prema kriterijima Uredbe (EZ) br. 1272/2008 o razvrstavanju, označavanju i pakiranju tvari i smjesa.

2.2. Elementi označavanja

Označavanje prema Uredbi (EZ) br. 1272/2008 [CLP/GHS]
Piktogrami opasnosti: Nije primjenjivo.
Oznaka opasnosti: Nije primjenjivo.
Oznake upozorenja: Nije primjenjivo.
Oznake obavijesti: Nije primjenjivo.
Dopunske informacije na naljepnici: Nije primjenjivo.

2.3. Ostale opasnosti

Nema.

ODJELJAK 3.: Sastav/informacije o sastojcima

3.1. Tvari

Naziv	Indeks broj	Maseni udio [mas %]
Kalijev klorid	Nema	≥ 95

Opis tvari: jednokomponentna tvar.
Molekularna formula: KCl.
Fizikalno-kemijska karakterizacija tvari: Negoriva čvrsta tvar, topiva u vodi, higroskopna.

ODJELJAK 4.: Mjere prve pomoći

4.1. Opis mjera prve pomoći

Udisanje: Izvesti osobu na svjež zrak.
Dodir s kožom: Isprati sapunom vodom.
Dodir s očima: Isprati oči tekućom vodom, pri tome držati kapke otvorenima.
Gutanje: Isprati usta, piti mnogo vode. Ako je potrebno, konzultirati liječnika.

4.2. Najvažniji simptomi i učinci, akutni i odgođeni

Udisanje: Slaba iritacija u obliku kašlja, pomanjkanje daha i grlobolja kod osjetljivih osoba.
Koža: Slaba iritacija u obliku crvenila i svrbeža.
Oči: Slaba iritacija - crvenilo, suzenje.
Kronično izlaganje: Nema podataka.

4.3. Hitna liječnička pomoć i posebna obrada

Nema.

ODJELJAK 5.: Mjere gašenja požara

5.1. Sredstva za gašenje

Tvar nije zapaljiva. Odabrati sredstva za gašenje prema gorivim tvarima u okruženju.

5.2. Posebne opasnosti koje proizlaze iz tvari ili smjese

Zahvaćen požarom može osloboditi opasne pare ili produkte raspadanja – klorovodik.

5.3. Savjeti za gasitelje požara

Posebna zaštitna oprema za vatrogasce
Koristiti samostalni uređaji za disanje s otvorenim krugom sa stlačenim zrakom (HRN EN 137, tip 2) s maskom za cijelo lice (HRN EN 136). Zahtjevi za svojstva zaštitne odjeće za gašenje požara definirana su standardom HRN EN 469.

ODJELJAK 6.: Mjere kod slučajnog ispuštanja

6.1. Osobne mjere opreza, zaštitna oprema i postupci u slučaju opasnosti

Nositi zaštitnu masku. Pažljivo pomesti, prikupiti i ukloniti. Izbjegavati podizanje prašine. Nakon čišćenja prozračiti prostor i isprati područje prosipanja.

6.2. Mjere zaštite okoliša

Mali rizik za vode. U slučaju ispuštanja vrlo velikih količina u vodotokove, odvode ili kanalizaciju, obavijestiti odgovarajuće nadležno tijelo (vidjeti pododjeljak 1.4.).

6.3. Metode i materijal za sprječavanje širenja i čišćenje

Mala količina rasutog materijala
Prikupiti u spremnik za anorganske čvrste tavri.

Velika količina rasutog materijala
Neutralna otopina (pH kontrola):
Prikupiti u spremnik za slane otopine, podesiti pH na 6-8. Spremnici za prikupljanje moraju biti jasno označeni sa opisom sadržaja. Odložiti na prozračnom mjestu. Predati na zbrinjavanje u skladu s propisima.

6.4. Uputa na druge odjeljke

Za osobnu zaštitnu opremu vidjeti odjeljak 8. Za postupanje s otpadom vidjeti odjeljak 13.

ODJELJAK 7.: Rukovanje i skladištenje

7.1. Mjere opreza za sigurno rukovanje

Osigurati odgovarajuću ventilaciju pri nadopunjavanju spremnika, prmještanju ili manipulaciji u rasutom stanju. Izbjegavati podizanje prašine. Koristiti zatvorene sustave gdje je to moguće. Korisiti samo jasno označene spremnike. Ne ostavljati spremnike otvorenima. Držati dalje od inkompatibilnih tvari. Prašinu čije se nakupljanje nije moglo izbjeći sakupljati redovno. Korisiti industrijski usisavač ili sustav za odsis zraka.

7.2. Uvjeti sigurnog skladištenja, uzimajući u obzir moguće inkompatibilnosti

Tehničke mjere i uvjeti skladištenja
Skladištiti u dobro prozračenom, najbolje natkrivenom prostoru ili skladišnoj zgradi s odsisnom ventilacijom. Držati dalje od nekompatibilnih materijala, vrućine, vlage i izravne sunčeve svjetlosti. Radi očuvanja kvalitete proizvoda preporučena temperatura skladištenja je ispod 50 ºC.

Skladištenje u rasutom stanju:
Proizvod u rasutom stanju skladištiti u zatvorenim suhim prostorima s primjerenom ventilacijom, pod skladišta i hrpu skladištenog proizvoda prekriti PE ili PE/PP folijom.
Pri zajedničkom skladištenju različite vrste gnojiva i materijali koji nisu gnojiva trebaju biti dobro odvojeni kako bi se spriječila međusobna kontaminacija. Dobro razmotriti njihovu kompatibilnost uključujući i u slučaju požara.

Preporuke za slaganje:
- vreće do 50 kg: vertikalni slog vreća najviše do 2 m visine,
- vreće na paletama: najviše 2 palete u vertikalnom slogu,
- velike vreće do 500 kg: najviše 3 vreće u vertikalnom slogu,

- velike vreće do 1000 kg: najviše 2 vreće u vertikalnom slogu.

Kod određivanja najveće visine slogova treba u obzir uzeti stabilnost sloga, čvrstoću vreće i sigurnost rukovanja pri utovaru i istovaru. Najveća visina slogova treba biti u skladu s nacionalnim propisima, ako postoje.

7.3. Posebna krajnja uporaba ili uporabe

Nema.

ODJELJAK 8.: Nadzor nad izloženošću/osobna zaštita

8.1. Nadzorni parametri

8.1.1. Granične vrijednosti izlaganja na radnom mjestu

Proizvod ne sadrži opasne tvari za koje su propisane granične vrijednosti izlaganja na radnom mjestu.
Granična vrijednost izloženosti ukupnoj prašini* je 10 mg/m^3.

**Pravilnik o graničnim vrijednostima izloženosti opasnim tvarima pri radu i o biološkim graničnim vrijednostima, NN 13/09, NN 75/13.*

8.1.2. Vrijednosti DNEL/PNEC

Nema podataka.

8.2. Nadzor nad izloženošću

Spriječiti nastajanje prašine. Osigurati primjerenu ventilaciju u područjima rada i skladištenja.

8.2.1. Ključni detalji nadzora nad izloženošću radnika

Zaštita očiju/lica: Zaštitne naočale za kemikalije s bočnom zaštitom ili potpuni štitnik za lice (vizir) (HRN EN 166).
Zaštita kože: Zaštitna odjeća (HRN EN ISO 13982) i obuća (HRN EN 13832, HRN EN ISO 20347), nepropusne kemijski otporne zaštitne rukavice (HRN EN 374).
Zaštita dišnog sustava: Polumaska za zaštitu od prašine/čestica (HRN EN 149) ili polumaska (HRN EN 140) s filtrom za čestice P1 ili FFP1 (HRN EN 143).

Osobna zaštitna oprema bi se trebala koristiti zajedno s drugim mjerama nadzora nad rizicima kao što su dizajn procesa (npr. kontrola razine zagađenja, korištenje zatvorenih procesa, lokalna ventilacija), dizajn proizvoda (npr. nizak stupanj prašenja), radno mjesto (razrjeđivanje ventilacijom) ili radna metoda (automatizacija). Osobna zaštitna oprema trebala bi se koristiti kao dodatna mjera upravljanja rizicima tamo gdje druge mjere nisu dovoljne ili kao jedina mjera upravljanja rizicima u posebnim slučajevima (npr. za vrijeme kratkotrajnih aktivnosti niske učestalosti kao što je čišćenje i održavanje ili za zaštitu profesionalnog interventnog osoblja).

8.2.2. Nadzor nad izloženošću okoliša

Ne ispuštati u vodotokove ili odvode. Za slučajno ispuštanje vidjeti odjeljak 6.

ODJELJAK 9.: Fizikalna i kemijska svojstva

9.1. Informacije o osnovnim fizikalnim i kemijskim svojstvima

Svojstvo	Jedinica	Vrijednost	Referentni uvjeti
Izgled		Čvrste granule, ružičaste do smeđe-crvene boje.	20 °C, 1013 hPa
Miris		Bez mirisa.	
Prag mirisa	ppm	Nije primjenjivo	
pH		5,5 - 8,8	Vodena otopina50 g/l, 25 °C
Talište/ledište	°C	768-772	
Početna točka vrenja i područje vrenja	°C	1407	
Plamište	°C	Nije primjenjivo	
Brzina isparavanja		Nije primjenjivo	
Zapaljivost		Nije zapaljivo	
Gornja/donja granica zapaljivosti ili granice eksplozivnosti	%	Nije primjenjivo	
Tlak pare	Pa	Nije primjenjivo	
Gustoća pare	g/cm^3	Nije primjenjivo	
Gustoća	g/cm^3	1,98	
Topljivost(i)	g/l	330-347	Voda, 20 °C
Koeficijent raspodjele: n-oktanol/voda	logPow	Nije primjenjivo	
Temperatura samozapaljenja	°C	Nije primjenjivo	
Temperatura raspada	°C	Nema podataka	
Viskoznost	mPa s	Nije primjenjivo	
Eksplozivna svojstva		Nije eksplozivno	
Oksidirajuća svojstva		Nema oksidirajuća svojstva	

9.2. Ostale informacije

Tvar je higroskopna (CRH = 50-70 % at 25 °C).

ODJELJAK 10.: Stabilnost i reaktivnost

10.1. Reaktivnost

Reagira s kiselinama i bazama.

10.2. Kemijska stabilnost

Stabilan proizvod kod preporučenih uvjeta skladištenja i rukovanja.

10.3. Mogućnost opasnih reakcija

Može reagirati opasno s jakim oksidirajućim sredstvima.

10.4. Uvjeti koje treba izbjegavati

Nema.

10.5. Inkompatibilni materijali

Jaka oksidirajuća sredstva.

Kompatibilnost s različitim gnojivima
Amonijev nitrat, KAN, Amonijev sulfat, Kalcijev nitrat:
Ograničena kompatibilnost. Uzeti u obzir mogućnost samoodržive razgradnje i ukupni udio uljnih površinskih aditiva.

10.6. Opasni proizvodi raspada

Klorovodik.

ODJELJAK 11.: Toksikološke informacije

11.1. Informacije o toksikološkim učincima

11.1.1. Akutna toksičnost

Tvar nije razvrstana kao opasna.

$LD50_{\text{oralno, štakor}}$ = 2600* mg/kg

** National Institute of Health (NIH), USA, - Technical Database Services (TDS), New York, 2009*

11.1.2. Nagrizanje/nadraživanje kože
Tvar nije razvrstana kao opasna.

11.1.3. Ozbiljno oštećenje/nadraživanje očiju
Tvar nije razvrstana kao opasna.

11.1.4. Izazivanje preosjetljivosti dišnih putova ili kože
Tvar nije razvrstana kao opasna.

11.1.5. Mutageni učinak na spolne stanice
Tvar nije razvrstana kao opasna.

11.1.6. Karcinogenost
Tvar nije razvrstana kao opasna.

11.1.7. Reproduktivna toksičnost
Tvar nije razvrstana kao opasna.

11.1.8. TCOJ - jednokratno izlaganje
Tvar nije razvrstana kao opasna.

11.1.9. TCOP - ponavljano izlaganje
Tvar nije razvrstana kao opasna.

11.1.10. opasnost od aspiracije
Tvar nije razvrstana kao opasna.

ODJELJAK 12.: Ekološke informacije

12.1. Toksičnost

Tvar nije razvrstana kao opasna.

$LC50_{riba}$ (96 sati) Min: 880 mg/l Max: 880 mg/l Median: 880 mg/l	$LC50_{rakovi}$ (48 sati) Min: 21,1 mg/l Max: 660 mg/l Median: 419 mg/l	$EC50_{rakovi}$ (48 sati) Min: 141 mg/l Max: 141 mg/l Median: 141 mg/l

Ecotoxicological Data, compiled by the US Environmental Protection Agency (EPA), selected and distributed by Technical Database Services (TDS), New York, 2009.

12.2. Postojanost i razgradivost

Tvar je stabilna u vodenoj otopini, ($t_{1/2}$) > 30 dana.

12.3. Bioakumulacijski potencijal

Nema podataka.

12.4. Pokretljivost u tlu

Nema podataka.

12.5. Rezultati ocjenjivanja svojstava PBT i vPvB

Ne ispunjava PBT i vPvB kriterije.

12.6. Ostali štetni učinci

Nema podataka.

ODJELJAK 13.: Zbrinjavanje

13.1. Metode obrade otpada

Ključni brojevi otpada proizvoda/oznake otpada
06 10 neopasan otpad od PFDU dušikovih kemikalija, dušičnih kemijskih procesa i proizvodnje gnojiva,
06 10 99 neopasan otpad koji nije specificiran na drugi način.

Ključni broj/oznaka otpada za ambalažu
15 01 02 ambalaža od plastike (neopasan otpad).
Primjena drugog ključnog broja otpada, ovisno o uvjetu i procesu stvaranja otpada nije isključena.

Informacije o obradi otpada
Ostaci proizvoda: Neopasan otpad. Ako ne postoje uvjeti za ponovnu uporabu, odložiti u skaldu s propisima.
Ambalaža: Ispražnjeni spremnici ne smatraju se opasnim otpadom.

ODJELJAK 14.: Informacije o prijevozu

Proizvod nije razvrstan kao opasan u skladu s uredbama o prijevozu opasnih tvari.

14.1. UN broj

Nema.

14.2. Ispravno otpremno ime UN

Nema.

14.3. Prijevozni razred(i) opasnosti

Nema.

14.4. Skupina pakiranja

Nema.

14.5. Opasnosti za okoliš

Nema.

14.6. Posebne mjere opreza za korisnika

Nema podataka.

14.7. Prijevoz u razlivenom stanju u skladu s Prilogom II. MARPOL 73/78 i Kodeksom IBC

Nema podataka.

ODJELJAK 15.: Informacije o propisima

15.1. Propisi u području sigurnosti, zdravlja i okoliša/posebni propisi za tvar ili smjesu

Propisi koji reguliraju proizvodnju i uporabu proizvoda:
Zakon o provedbi Uredbe (EZ) br. 1907/2006, NN br. 53/08, 18/13, Uredba (EZ) br. 1907/2006 (REACH), SL L 396/2006, Zakon o provedbi Uredbe (EZ) br. 1272/2008 NN 50/12, 18/13, Uredba (EZ) br. 1272/2008., OJ 353/2008, Zakon o provedbi Uredbe (EZ) br. 2003/2003, NN 81/13, Uredba (EZ) br. 2003/2003, OJ L 304/2003, Zakon o zaštiti na radu, NN 71/14, Pravilnik o graničnim vrijednostima izloženosti opasnim tvarima pri radu i o biološkim graničnim vrijednostima, NN 13/09, 75/13, Zakon o prijevozu opasnih tvari, NN 79/07, Zakon o održivom gospodarenju otpadom, NN 94/13, Uredba o kategorijama, vrstama i klasifikaciji otpada s katalogom otpada i listom opasnog otpada, NN 50/05, 39/09.

15.2. Ocjenjivanje kemijske sigurnosti

Nema podataka. Prema Dodatku V Uredbe (EZ) br. 1907/2006, tvar je izuzeta iz obaveze REACH registracije. S obbzirom da tvar nije razvrstana kao opasna niti kao PBT ili vPvB tvar i nema propisane granične vrijednosti izloženosti, nisu potrebni Scenariji izloženosti ljudi i okoliša.

ODJELJAK 16.: Ostale informacije

16.1. Naznake o izmjenama u odnosu na prethodnu reviziju

Novi dokument.

16.2. Skraćenice i akronimi

DNEL (*eng. Derived no-effect level*): Izvedena razina bez učinka,
Kodeks IBC: Međunarodni kodeks za prijevoz kemikalija u rasutom stanju,
Kodeks IMSBC: Međunarodni prijevoz rasutih krutih tereta morem,
MARPOL: Međunarodna konvencija o sprečavanju zagađenja s brodova,
OEL (*eng. Occupational exposure limit*): Granične vrijednosti izlaganja na radnom mjestu,
PBT (*eng. Persistent bioaccumulative and toxic*): Postojan, bioakumulativan i toksičan,
PNEC (*eng. Predicted no effect concentration*): Predviđena koncentracija bez učinka,
PPE (*eng. Personal protective equipment*): Osobna zaštitna oprema,
RMM (*eng. Risk Management Measures*): Mjere upravljanja rizikom,
vPvB (*eng. Very persistent and very bioaccumulative*): vrlo postojan i vrlo bioakumultivan.

16.3. Dodatne informacije

Reference i izvori podataka

1. Material Safety Data Sheet, Muriate of Potash, JSC Uralkali, Russia, Version: 2, Compilation date: 02.06.2014.
2. Material Safety Data Sheet, Muriate of Potash, JSC Belaruskali, Belarus, Version: 1, Compilation date: 27.12.2010.
3. GESTIS baza podataka (*IFA - Institut für Arbeitschutz der Deutschen Gesetzlichen Unfallversicherung*),
4. Guidance for the compatibility of fertilizer blending materials, *EFMA – European Fertilizer Manufacturers Association, Brussels, June 2006,*
5. Guidance for the storage, handling and transportation of solid mineral fertilizers, *EFMA – European Fertilizer Manufacturers Association, Brussels, April 2007.*

Napomena:
Gore navedene informacije temelje se na podacima raspoloživim do datuma izrade. Ovaj sigurnosno-tehnički list ne predstavlja niti podrazumijeva jamstvo u odnosu na sastav, svojstva ili djelovanje i njime se ne uspostavlja nikakav pravno valjani ugovorni odnos.

kemika
dioničko društvo za proizvodnju kemijskih proizvoda

1. NAZIV PROIZVODA / PODACI O PROIZVOĐAČU

1.1	Naziv proizvoda:	**KALIJ-PERMANGANAT,** p.a.
1.2	Kataloški broj:	11233
1.3	Proizvođač:	Kemika d.d., Heinzelova 53, Zagreb, Hrvatska
1.4	Telefon za informacije:	01 24 41 400
1.5	Telefon u slučaju opasnosti:	01 24 41 400

2. IDENTIFIKACIJA I INFORMACIJE O SASTAVU

2.1	Sinonimi:	
2.2	CAS:	7722-64-7
2.3	Relativna molekulska masa:	158,04
2.4	Molekulska formula:	$KMnO_4$
2.5	EC:	025-002-00-9
2.6	EINECS:	2317603

3. OZNAKA OPASNOSTI

Xn - Štetno za zdravlje; O - Oksidirajuće

4. PRVA POMOĆ

4.1 U slučaju dodira s kožom:
Zagađenu odjeću odmah skinuti. Mjesto dodira s kožom isprati odmah s puno vode.

4.2 U slučaju dodira s očima:
Odmah obilato isprati tekućom vodom, čistim prstima rastvoriti očne kapke i kružiti očima tako da voda dospije u sve dijelove oka. Zatražiti liječničku pomoć.

4.3 Ako se udahne:
Udisati svježi zrak. Ako osoba ne diše primijeniti umjetno disanje, ako diše otežano dati kisik. Zatražiti liječničku pomoć.

4.4 Ako se proguta:
Piti sok od limuna ili naranče, dodatno mlijeko ili otopinu šećera i nakon nekoliko minuta izazvati povraćanje.

5. MJERE U SLUČAJU POŽARA

5.1 Pogodna sredstva za gašenje:
Požar se gasi s mnogo vode ili vodene magle.

5.2 Posebna upozorenja:
Kalij-permanganat ne gori, ali podržava gorenje. U dodiru s mnogim organskim tvarima uzrokuje požar. U dodiru s jakim kiselinama (npr. sulfatna kiselina) izaziva eksploziju. Kod gašenja požara treba postupati vrlo pažljivo zbog opasnosti od eksplozije.

6. MJERE U SLUČAJU NEZGODE

6.1. Zaštita osoba:

Odmah napustiti prostoriju. U prostoriju smije ući samo osoblje opremljeno potpunom zaštitnom opremom, koja uključuje izolacijski aparat za disanje.

6.2 Mjere u slučaju prolijevanja /curenja/ izlaska plina:

Prosuti kalij-permanganat se pokupi u poseban spremnik. Mjesto prosipanja se dobro ispere vodom.

7. RUKOVANJE I SKLADIŠTENJE

7.1 Rukovanje:

Upotrebljavati propisana zaštitna sredstva.

7.2 Skladištenje:

Čuvati dobro zatvoreno, u suhom i hladnom prostoru, podalje od gorivih, lako zapaljivih kemikalija i jakih kiselina.

8. KONTROLA IZLOŽENOSTI / ZAŠTITA OSOBA

8.1	Specifični kontrolni parametri:	MDK:	mg/m^3
8.2	Osobna zaštita:		
	dišnih organa:	respirator	
	ruku:	zaštitne rukavice	
	očiju:	zaštitne naočale	
	ostalo:		

8.3 Radna higijena:

Pri radu sa kalij-permanganatom oči treba zaštititi zaštitnim naočalama, ruke gumenim rukavicama, tijelo zaštitnim odijelom, noge zaštitnim cipelama. U slučaju prašenja koristiti respirator za zaštitu dišnih puteva.

9. FIZIKALNA I KEMIJSKA SVOJSTVA

9.1	Oblik:	krutina	
9.2	Boja:	ljubičasta	
9.3	Miris:	bez mirisa	
9.4	pH-vrijednost		
	2 %-tne vodene otopine (20°C):	7,2 - 9,7	
9.5	Talište:	50	°C
9.6	Vrelište:		
9.7	Temperatura samozapaljenja:		
9.8	Plamište:		
9.9	Granice eksplozivnosti:		
9.10	Tlak para:		
9.11	Gustoća (20°C):	2,7	g/cm^3
9.12	Topljivost u vodi (20°C):	65	g/dm^3

9.13 Viskozitet:

10. STABILNOST I REAKTIVNOST

10.1 Uvjeti koje treba izbjegavati:
Zagrijavanje, povišene temperature, izlaganje sunčevoj svjetlosti.

10.2 Opasne reakcije:
S mnogim organskim tvarima uzrokuje požar. U dodiru s jakim kiselinama (npr. sulfatnom kiselinom) uzrokuje eksploziju.

10.3 Opasni raspadni produkti:

10.4 Ostale informacije:

11. TOKSIKOLOŠKI PODACI

11.1 Toksičnost:

RTECS:	SD 6475000	
$LD50_{(oral., štakor)}$:	1090	mg/kg
$LDLo_{(oral.,čovjek)}$:	143	mg/kg

11.2 Djelovanje na kožu:
Nagriza kožu.

11.3 Djelovanje na oči:
Nagriza sluznicu oka.

11.4 Udisanje:
Nagriza sluznicu i tkivo dišnih puteva.

11.5 Gutanje:
Uzrokuje draženje u području želuca i crijeva, grčeve i povraćanje.

12. EKOLOŠKI PODACI

12.1 Ekotoksično djelovanje:
Na ribe i plankton djeluje baktericidno. Dio kalij-permanganata se nakuplja u tkivu riba.

12.2 Ostale informacije:
Otjecanje velikih količina otpadnih otopina kalij-permanganata može uzrokovati nakupljanje u podzemnoj vodi i time opasnost za vodu za piće (zbog bojenja). Toksično za ribe 3,2 mg/l.

13. ZBRINJAVANJE OTPADA

Generalna rješenja za zbrinjavanje ne postoje i u svakoj državi ona moraju biti u skladu s važećim zakonima. Preporučamo kontaktirati nadležnu ustanovu koja se bavi problematikom odlaganja i uništavanja kemijskog otpada.

14. TRANSPORT

14.1	Kopneni prijevoz:	ADR: 5.1/17b	RID: 5.1/17b
14.2	Zračni prijevoz:	ICAO/IATA: 5.1 UN 1490	PAX: 508 CAO: 511
14.3	Transport morem:	IMDG: 5.1/II UN 1490	

15. PROPISI O OZNAČAVANJU

15.1	Simbol opasnosti:	Xn - Štetno za zdravlje; O - Oksidirajuće
15.2	Upozorenje "R":	8-22
15.3	Obavjest "S":	2
15.4	Grupa zapaljivosti:	
15.5	Grupa otrovnosti:	IV

16. OSTALE INFORMACIJE

Datum tiskanja: 26. svibnja 1998.

Obavijesti sadržane u ovome obliku osnivaju se na našem sadašnjem saznanju. Iste ne predstavljaju garanciju kvalitete opisanog proizvoda.

kemika
dioničko društvo za proizvodnju kemijskih proizvoda

1. NAZIV PROIZVODA / PODACI O PROIZVOĐAČU

1.1	Naziv proizvoda:	**NATRIJ-DIFOSFAT-DEKAHIDRAT, krist., p.a.**
1.2	Kataloški broj:	14063
1.3	Proizvođač:	Kemika d.d., Heinzelova 53, Zagreb, Hrvatska
1.4	Telefon za informacije:	01 24 41 400
1.5	Telefon u slučaju opasnosti:	01 24 41 400

2. IDENTIFIKACIJA I INFORMACIJE O SASTAVU

2.1 Sastav:

Naziv	CAS	Sadržaj	Formula	Mr
Natrij-difosfat.dekahidrat	13472-36-1	99-100 %	$Na_4P_2O_7$ x 10 H_2O	446,06

2.2	Sinonimi:	Natrij-pirofosfat
2.3	EC:	
2.4	EINECS:	231-767-1

3. PODACI O OPASNOSTI

3.1 Oznaka opasnosti:

3.2 Upozorenja:

Oprez! Štetno ako se proguta ili udiše. Može izazvati iritaciju kože, očiju i respiratornog trakta.

4. PRVA POMOĆ

4.1 U slučaju dodira s kožom:

Zagađenu odjeću odmah skinuti. Mjesto dodira s kožom temeljito oprati vodom. Ako se pojavi iritacija kože zatražiti pomoć liječnika.

4.2 U slučaju dodira s očima:

Odmah ispirati sa nježnim ali obilnim mlazom vode najmanje 15 min. odižući povremeno gornje i donje kapke. Zatražiti pomoć liječnika

4.3 Ako se udahne:

Izvesti unesrećenu osobu na svježi zrak. Ako ne diše, dati umjetno disanje. Ako je disanje otežano, dati kisik. Zatražiti pomoć liječnika.

4.4 Ako se proguta:

Ne izazivati povraćanje. Piti veće količine vode. Nikada ne davati ništa oralnim putem osobi bez svijesti. Zatražiti pomoć liječnika.

5. MJERE U SLUČAJU POŽARA

5.1 Pogodna sredstva za gašenje:
Sredstvo za gašenje prilagoditi okolini.

5.2 Zapaljivost:
Ne spada u požarno opasne tvari.

5.3 Eksplozivnost:
Ne spada u eksplozivne tvari.

5.4 Posebna upozorenja:
U slučaju požara svo osoblje u zoni opasnosti mora biti opremljeno potpunom zaštitnom opremom.

6. MJERE U SLUČAJU NEZGODE

6.1. Zaštita osoba:
Isključiti sve izvore topline i paljenja i napustiti prostoriju. U prostoriju smije ući samo osoblje koje će izvršiti dekontaminaciju, opremljeno potrebnom zaštitnom opremom.

6.2 Mjere u slučaju prolijevanja /curenja/ izlaska plina:
U slučaju prosipanja kemikaliju pokupiti i spremiti u dobro zatvoren spremnik. Mjesto prosipanja temeljito oprati. Prozračiti prostoriju.

7. RUKOVANJE I SKLADIŠTENJE

7.1 Rukovanje:
Upotrebljavati propisana zaštitna sredstva.

7.2 Skladištenje:
U dobro zatvorenoj ambalaži, u suhoj, hladnoj i dobro ventiliranoj prostoriji.

8. KONTROLA IZLOŽENOSTI / ZAŠTITA OSOBA

8.1 Specifični kontrolni parametri: MDK:

8.2 Osobna zaštita:

dišnih organa:	respirator
kože:	zaštitne rukavice i zaštitna odjeća
očiju:	zaštitne naočale

8.3 Radna higijena:
Koristiti sredstva osobne zaštite. Osigurati prikladnu ventilaciju koja smanjuje izloženost na najmanju moguću mjeru.

9. FIZIKALNA I KEMIJSKA SVOJSTVA

9.1	Izgled:	transparentni, bezbojni kristali
9.2	Miris:	bez mirisa
9.3	pH-vrijednost:	9,5 - 10,5
9.4	Talište:	~ 79,5 °C
9.5	Topljivost u vodi (20°C):	60 g/dm^3

10. STABILNOST I REAKTIVNOST

10.1 Uvjeti koje treba izbjegavati:
Vlaga, zagrijavanje.
10.2 Opasne reakcije:
S jakim oksidansima.
10.3 Opasni raspadni produkti:
Oksidi fosfora.
10.4 Ostale informacije:

11. TOKSIKOLOŠKI PODACI

11.1 Toksičnost: RTECS:
$LD50_{(oral., stakor)}$: 4000 mg/kg (bezvodna supstanca)

11.2 Djelovanje na kožu:
Nadražuje kožu. Simptomi su crvenilo, svrab i bol.
11.3 Djelovanje na oči:
Izaziva iritaciju, cvenilo i bol.
11.4 Udisanje:
Može izazvati iritaciju respiratornog trakta. Simptomi su kašalj, bol u grlu i otežano disanje.
11.5 Gutanje:
Može izazvati iritaciju probavnog trakta. Simptomi su mučnina, povraćanje, proljev

12. EKOLOŠKI PODACI

12.1 Ekotoksično djelovanje:

12.2 Ostale informacije:

13. ZBRINJAVANJE OTPADA

Generalna rješenja za zbrinjavanje ne postoje i u svakoj državi ona moraju biti u skladu s važećim zakonima. Preporučamo kontaktirati nadležnu ustanovu koja se bavi problematikom odlaganja i uništavanja kemijskog otpada.

14. TRANSPORT

14.1	Kopneni prijevoz:	RID/ADR:		
14.2	Zračni prijevoz:	ICAO/IATA:	PAX:	CAO:
14.3	Transport morem:	IMDG:		

15. PROPISI O OZNAČAVANJU

15.1 Simbol opasnosti:
15.2 Upozorenje "R":
15.3 Obavjest "S":
15.4 Grupa zapaljivosti:
15.5 Grupa otrovnosti:

16. OSTALE INFORMACIJE

Obavijesti sadržane u ovome obliku osnivaju se na našem sadašnjem saznanju. Iste ne predstavljaju garanciju kvalitete opisanog proizvoda.

kemika
dioničko društvo za proizvodnju kemijskih proizvoda

1. NAZIV PROIZVODA / PODACI O PROIZVOĐAČU

1.1	Naziv proizvoda:	**AMONIJ-OKSALAT-MONOHIDRAT, p.a.**
1.2	Kataloški broj:	01386
1.3	Proizvođač:	Kemika d.d., Heinzelova 53, Zagreb, Hrvatska
1.4	Telefon za informacije:	01 24 41 400
1.5	Telefon u slučaju opasnosti:	01 24 41 400

2. IDENTIFIKACIJA I INFORMACIJE O SASTAVU

2.1	Sinonimi:	Oksalna kiselina amonijeva sol
2.2	CAS:	6009-70-7
2.3	Relativna molekulska masa:	142,11
2.4	Molekulska formula:	$(NH_4)_2C_2O_4 \times H_2O$
2.5	EC:	607-007-00-3
2.6	EINECS:	214-202-3

3. OZNAKA OPASNOSTI

T - Otrov

4. PRVA POMOĆ

4.1 U slučaju dodira s kožom:
Skinuti suvišan materijal sa kože, i tada odmah ispirati sa puno vode najmanje 15 min. Skinuti kontaminiranu odjeću i obuću. Pozvati liejčnika.

4.2 U slučaju dodira s očima:
Odmah ispirati sa puno vode najmanje 15 min., odižući povremeno gornje i donje kapke. Hitno pozvati liječnika.

4.3 Ako se udahne:
Izvesti unesrećenu osobu na svježi zrak. Ako ne diše, dati umjetno disanje. Ako je disanje otežano, dati kisik. Pozvati liječnika.

4.4 Ako se proguta:
Ne izazivati povraćanje. Dati velike količine vode. Nikada ne davati ništa oralnim putem osobi bez svijesti. Odmah pozvati liječnika.

* Uputa liječniku:
Pažljivo motriti kardiovaskularne, respiratorne, neurološke i bubrežne funkcije. Tretirati u konzultaciji sa medicinskim toksikologom.

5. MJERE U SLUČAJU POŽARA

5.1 Pogodna sredstva za gašenje:
Koristiti sva pogodna sredstva za gašenje okolne vatre.

5.2 Posebna upozorenja:
Ne predstavlja opasnost od požara i eksplozije.

6. MJERE U SLUČAJU NEZGODE

6.1. Zaštita osoba:
Proventilirati područje nezgode. Nositi odgovarajuću zaštitnu opremu.

6.2 Mjere u slučaju prolijevanja /curenja/ izlaska plina:
Pomesti i staviti u kontejner za preradu ili odlaganje. Prosuto se može usisati ili pomesti vlažnom metlom kako bi se izbjeglo podizanje prašine.

7. RUKOVANJE I SKLADIŠTENJE

7.1 Rukovanje:
Upotrebljavati propisana zaštitna sredstva.

7.2 Skladištenje:
Držati u dobro zatvorenim kontejnerima. Skladištiti na hladnom, suhom, ventiliranom mjestu. Zaštititi od fizičkih oštećenja. Izolirati od nekompatibilnih tvari. I ispražnjeni kontejneri mogu biti opasni budući sadrže ostatke kemikalije.

8. KONTROLA IZLOŽENOSTI / ZAŠTITA OSOBA

8.1 Specifični kontrolni parametri: MDK: mg/m^3

8.2 Osobna zaštita:

dišnih organa:	respirator
ruku:	zaštitne rukavice
očiju:	zaštitne naočale; u radnom prostoru imati izvor vode za ev. potrebno ispiranje očiju
ostalo:	

8.3 Radna higijena:
Nositi propisanu zaštitnu opremu. Kontaminiranu odjeću i obuću oprati prije ponovne upotrebe.

9. FIZIKALNA I KEMIJSKA SVOJSTVA

9.1	Oblik:	kristali ili granule	
9.2	Boja:	bezbojno	
9.3	Miris:	bez mirisa	
9.4	pH-vrijednost:	~ 6,3 (50 g/l, H_2O, 25 °C)	
9.5	Talište:	70	°C
9.6	Gustoća (20°C):	~ 1,48	g/cm^3
9.7	Topljivost u vodi (20°C):	~ 45	g/l
9.8	Nasipna težina:	~ 480	kg/m^3

10. STABILNOST I REAKTIVNOST

10.1 Uvjeti koje treba izbjegavati:
Vrućina, nekompatibilne tvari (natrij hipoklorit + amonij acetat, jake kiseline)

10.2 Opasne reakcije:

10.3 Opasni raspadni produkti:
Gorenjem može nastati amonijak, oksidi dušika.

10.4 Ostale informacije:
Produkt je stabilan u normalnim uvjetima skladištenja i rukovanja.

11. TOKSIKOLOŠKI PODACI

11.1 Toksičnost: RTECS:

11.2 Djelovanje na kožu:
Uzrokuje iritaciju kože. Simptomi: crvenilo, svrbež, bol.

11.3 Djelovanje na oči:
Uzrokuje iritaciju, crvenilo i bol.

11.4 Udisanje:
Prašina nagriza sluznicu. Oksalati mogu biti apsorbirani kroz pluća.
Simptomi trovanja: nervoza, grčevi, klonulost centralnog nervnog sistema.

11.5 Gutanje:
Procijenjena letalna doza za odraslog čovjeka je 15-30 g, s tim da smrt nastupa u roku nekoliko sati ili čak nekoliko minuta. Djeluje nagrizajuće na sluznicu, može doći do teškog gastrointestitisa, bolova, povraćanja, itd. Naglo smanjenje seruma kalcija može uzrokovati poremećaj funkcije mozga. Može se taložiti u bubrezima.

11.6 Kronična izloženost:
Nakon duljeg poremećaja metabolizma kalcija, do kojeg dolazi zbog oksalacije, može doći do otkazivanja cirkulacije ili poremećaja nervnog sistema.

11.7 Otežavajuća prije-postojeća stanja:
Osobe sa prije-postojećim kožnim poremećajima ili očnim problemima, ili sa oslabljenim jetrenim, bubrežnim ili respiratornim funkcijama mogu biti jače podložne štetnim efektima izloženosti supstanci.

12. EKOLOŠKI PODACI

12.1 Ekotoksično djelovanje:

12.2 Ostale informacije:

13. ZBRINJAVANJE OTPADA

Generalna rješenja za zbrinjavanje ne postoje i u svakoj državi ona moraju biti u skladu s važećim zakonima. Preporučamo kontaktirati nadležnu ustanovu koja se bavi problematikom odlaganja i uništavanja kemijskog otpada.

14. TRANSPORT

14.1	Kopneni prijevoz:	ADR: 6.1/25 c	RID: 6.1/25 c
14.2	Zračni prijevoz:	ICAO/IATA: 6.1 III UN 2811	PAX: 619 CAO: 619
14.3	Transport morem:	IMDG: 6.1/III UN 2811	

15. PROPISI O OZNAČAVANJU

15.1	Simbol opasnosti:	T - Otrov
15.2	Upozorenje "R":	21/22
15.3	Obavjest "S":	24/25
15.4	Grupa zapaljivosti:	
15.5	Grupa otrovnosti:	II

16. OSTALE INFORMACIJE

Datum tiskanja: 1. kolovoz 1999.

Obavijesti sadržane u ovome obliku osnivaju se na našem sadašnjem saznanju. Iste ne predstavljaju garanciju kvalitete opisanog proizvoda.