

SAFETY DATA SHEET

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SECTION 1. IDENTIFICATION

Product Identifier: (4N) 99.99% Tetraethylorthosilicate

Product Code: 4ETH-OSAT-04-LIQ

CAS Number: 78-10-4

Relevant identified uses of the substance: Scientific research and development

Supplier details:

American Elements
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SECTION 2. HAZARDS IDENTIFICATION

Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Flammable liquids (Category 3), H226

Acute toxicity, Inhalation (Category 4), H332

Eye irritation (Category 2A), H319

Specific target organ toxicity - single exposure (Category 3), Respiratory system, H335



Signal word: Warning

Hazard statement(s)

H226 Flammable liquid and vapor.

H319 Causes serious eye irritation.

H332 Harmful if inhaled.

H335 May cause respiratory irritation.

Precautionary statement(s)

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.
P261 Avoid breathing dust/ fume/ gas/ mist/ vapors/ spray.
P264 Wash skin thoroughly after handling.
P271 Use only outdoors or in a well-ventilated area.
P280 Wear protective gloves/ eye protection/ face protection.
P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340 + P312 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/ doctor if you feel unwell.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337 + P313 If eye irritation persists: Get medical advice/ attention.
P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
P403 + P235 Store in a well-ventilated place. Keep cool.
P405 Store locked up.
P501 Dispose of contents/ container to an approved waste disposal plant.
Hazards not otherwise classified (HNOC) or not covered by GHS - none

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms : Tetraethoxysilane
Orthosilicic acid tetraethyl ester
Formula : $\text{C}_8\text{H}_{20}\text{O}_4\text{Si}$
Molecular weight : 208.33 g/mol
CAS-No. : 78-10-4
EC-No. : 201-083-8

SECTION 4. FIRST AID MEASURES

Description of first-aid measures

General advice

Show this material safety data sheet to the doctor in attendance.

If inhaled

After inhalation: fresh air.

In case of skin contact

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

In case of eye contact

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

If swallowed

After swallowing: immediately make victim drink water (two glasses at most). Consult a physician.

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

Indication of any immediate medical attention and special treatment needed

No data available

SECTION 5. FIREFIGHTING MEASURES

Extinguishing media

Suitable extinguishing media

Carbon dioxide (CO₂) Foam Dry powder

Unsuitable extinguishing media

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

Special hazards arising from the substance or mixture

Carbon oxides

silicon oxides

Combustible.

Vapors are heavier than air and may spread along floors.

Forms explosive mixtures with air at elevated temperatures.

Development of hazardous combustion gases or vapours possible in the event of fire.

Advice for firefighters

In the event of fire, wear self-contained breathing apparatus.

Further information

Under fire conditions, material may decompose to form flammable and/or explosive mixtures in air. Remove container from danger zone and cool with water. Suppress (knock down) gases/vapors/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Advice for non-emergency personnel: Do not breathe vapors, aerosols. Avoid substance contact. Ensure adequate ventilation. Keep away from heat and sources of ignition.

Evacuate the danger area, observe emergency procedures, consult an expert.

For personal protection see section 8.

Environmental precautions

Do not let product enter drains. Risk of explosion.

Methods and materials for containment and cleaning up

Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up with liquid-absorbent material (e.g. Chemisorb®).

Dispose of properly. Clean up affected area.

SECTION 7. HANDLING AND STORAGE

Precautions for safe handling

Advice on safe handling

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

Advice on protection against fire and explosion

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

Hygiene measures

Change contaminated clothing. Preventive skin protection recommended. Wash hands after working with substance.

For precautions see section 2.2.

Conditions for safe storage, including any incompatibilities

Storage conditions

Store under nitrogen.

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

Moisture sensitive.

Storage class (TRGS 510): 3: Flammable liquids

Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure controls

Appropriate engineering controls

Change contaminated clothing. Preventive skin protection recommended. Wash hands after working with substance.

Personal protective equipment

Eye/face protection

Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Safety glasses

Skin protection

This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves.

Body Protection

Flame retardant antistatic protective clothing.

Respiratory protection

required when vapours/aerosols are generated.

Control of environmental exposure

Do not let product enter drains. Risk of explosion.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance Form: liquid

Color: colorless

Odor No data available

Odor Threshold No data available

pH No data available

Melting point/freezing point

Melting point: -82.5 °C (-116.5 °F) at ca.1,013 hPa

Initial boiling point and boiling range 168 °C 334 °F - lit.

Flash point 45 °C (113 °F) - closed cup - DIN 51755 Part 1

Evaporation rate No data available

Flammability (solid, gas) No data available

Upper/lower flammability or explosive limits

Upper explosion limit: 23 %(V)

Lower explosion limit: 1.3 %(V)

Vapor pressure < 1 hPa at 20 °C (68 °F)

Vapor density 7.19 - (Air = 1.0)

Relative density 0.933 g/cm³ at 20 °C (68 °F)

Water solubility 1.49 g/l at 23 °C (73 °F) at 7 hPa - soluble

Partition coefficient: n-octanol/water

log Pow: 3.18 at 40 °C (104 °F) - Bioaccumulation is not expected.
Autoignition temperature 222 °C (432 °F) at 960.8 hPa
Decomposition temperature No data available
Viscosity No data available
Explosive properties No data available
Oxidizing properties No data available

SECTION 10. STABILITY AND REACTIVITY

Reactivity

Vapor/air-mixtures are explosive at intense warming.

Chemical stability

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

May decompose on exposure to moist air or water.

Possibility of hazardous reactions

No data available

Conditions to avoid

Heating.

Incompatible materials

Strong oxidizing agents, Strong acids

Hazardous decomposition products

In the event of fire: see section 5

SECTION 11. TOXICOLOGICAL INFORMATION

Acute toxicity

LD50 Oral - Rat - male and female - > 2,500 mg/kg

(OECD Test Guideline 423)

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

LD50 Oral - Rat - 6,270 mg/kg

Remarks:

(RTECS)

LC50 Inhalation - Rat - male - 4 h - 10 mg/l

(OECD Test Guideline 403)

Remarks:

(Regulation (EC) No 1272/2008, Annex VI)

Symptoms: mucosal irritations, Cough, Shortness of breath, Inhalation may lead to the formation of oedemas in the respiratory tract., Possible damages:, damage of respiratory tract

LD50 Dermal - Rabbit - 5,878 mg/kg

Remarks:

(RTECS)

No data available

Skin corrosion/irritation

Skin - Rabbit

Result: No skin irritation - 4 h

(OECD Test Guideline 404)

Serious eye damage/eye irritation

Causes serious eye irritation. (Regulation (EC) No 1272/2008, Annex VI)

Respiratory or skin sensitization

Buehler Test - Guinea pig
Result: negative
(OECD Test Guideline 406)
Germ cell mutagenicity
Ames test
Salmonella typhimurium
Result: negative
Carcinogenicity
IARC: No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
NTP: No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.
Reproductive toxicity
No data available
Specific target organ toxicity - single exposure
May cause respiratory irritation.
Remarks:
Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)
Acute oral toxicity - Irritations of mucous membranes in the mouth, pharynx, oesophagus and gastrointestinal tract.
Acute inhalation toxicity - mucosal irritations, Cough, Shortness of breath, Inhalation may lead to the formation of oedemas in the respiratory tract., Possible damages:, damage of respiratory tract
Specific target organ toxicity - repeated exposure
No data available
Aspiration hazard
No data available
Repeated dose toxicity - Rat - male and female - Gavage - NOAEL (No observed adverse effect level) - 10 - 50 mg/kg
RTECS: VV9450000
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.
Systemic effects:
After uptake of large quantities:
Tiredness
narcosis
Damage to:
Kidney
Other dangerous properties can not be excluded.
Handle in accordance with good industrial hygiene and safety practice.
Liver - Irregularities - Based on Human Evidence
Liver - Irregularities - Based on Human Evidence

SECTION 12. ECOLOGICAL INFORMATION

Toxicity
Toxicity to fish semi-static test LC50 - Danio rerio (zebra fish) - > 245 mg/l - 96 h
(Regulation (EC) No. 440/2008, Annex, C.1)
Toxicity to daphnia
and other aquatic
invertebrates

flow-through test EC50 - Daphnia magna (Water flea) - > 75 mg/l - 48 h
(OECD Test Guideline 202)
Toxicity to algae static test ErC50 - Pseudokirchneriella subcapitata - > 100 mg/l - 72h
(OECD Test Guideline 201)
Toxicity to bacteria static test EC50 - activated sludge - > 100 mg/l - 3 h
(OECD Test Guideline 209)
Persistence and degradability
Biodegradability aerobic - Exposure time 28 d
Result: 98 % - Readily biodegradable.
(Directive 67/548/EEC Annex V, C.4.A.)
Bioaccumulative potential
No data available
Mobility in soil
No data available
Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted
Other adverse effects
No data available

SECTION 13. DISPOSAL CONSIDERATIONS

Waste treatment methods
Product
Waste material must be disposed of in accordance with the national and local No mixing with other waste. Handle uncleaned containers like the product See www.retrologistik.com for processes regarding the return of chemicals and containers, or contact us there if you have further questions.

SECTION 14. TRANSPORT INFORMATION

DOT (US)
UN number: 1292 Class: 3 Packing group: III
Proper shipping name: Tetraethyl silicate
Reportable Quantity (RQ):
Poison Inhalation Hazard: No
IMDG
UN number: 1292 Class: 3 Packing group: III EMS-No: F-E, S-D
Proper shipping name: TETRAETHYL SILICATE
Marine pollutant : yes
IATA
UN number: 1292 Class: 3 Packing group: III
Proper shipping name: Tetraethyl silicate

SECTION 15. REGULATORY INFORMATION

SARA 302 Components
This material does not contain any components with a section 302 EHS TPQ.
SARA 313 Components

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

Fire Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

No components are subject to the Massachusetts Right to Know Act

16. OTHER INFORMATION

Safety Data Sheet according to Regulation (EC) No. 1907/2006 (REACH). 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. American Elements shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale. COPYRIGHT 1997-2022 AMERICAN ELEMENTS. LICENSED GRANTED TO MAKE UNLIMITED PAPER COPIES FOR INTERNAL USE ONLY.