



Centre Anti-Poison pour le Québec: (800) 463-5060

Tél. (Qc): (418) 660-8666 / 800-890-8666


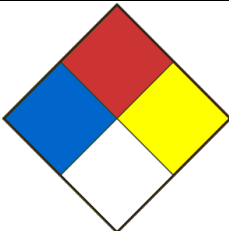
Fax. (Qc): (418) 660-8998

## SAFETY DATA SHEET

### SECTION 01 - PRODUCT AND COMPANY IDENTIFICATION

Product Identifier TETRAETHYL ORTHOSILICATE		Product Use Laboratory use	
Chemical formula Si(OC <sub>2</sub> H <sub>5</sub> ) <sub>4</sub>		Product code TP-0144	Molar weight 208,33
Chemical name / Commercial name / Synonymous TETRAETHOXYSILANE, ORTHOSILICIC ACID TETRAETHYL ESTER, ETHYL ORTHOSILICATE, SILICATE D'ETHYLE, SILICATE TETRAETHYLIQUE, TEOS, TETRAETHYL SILICATE			
Supplier's name Laboratoire MAT		Address-Street 610, Adanac Street	
City Québec		Province Québec	
Postal code G1C 7B7	Internet www.labmat.com	Phone number 418-660-8666 / 800-890-8666	
Emergency phone	CANUTEC: 613-996-6666		CENTRE ANTI-POISON DU QUÉBEC 800-463-5060
Date SDS 11/1/2019	SDS Prepared by Laboratoire MAT	E-Mail labmat@labmat.com	

## SECTION 02 - HAZARDS IDENTIFICATION

<b>Classification WHIMS / GHS</b>	Flammable liquids category 3 Serious eye damage/ Eye irritation category 2A Acute toxicity - Inhalation category 4 Specific target organ toxicity - Single exposure category 3
<b>Signal Word</b>	WARNING
<b>Hazards statements (H)</b>	H226 Flammable liquid and vapour. H319 Causes serious eye irritation. H332 Harmful if inhaled. H335 May cause respiratory irritation.
<b>Precautionary statements (P)</b>	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 / vapours / spray. P264 Wash the areas of the body that have been in contact with the product after handling. P271 Use only outdoors or in a well-ventilated area. P280 Wear protective gloves/protective clothing/eye protection/face protection. P303 + P361 + P353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. P304 + P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P312 Call a POISON CENTER or doctor/physician if you feel unwell. P337 + P313 If eye irritation persists: Get medical advice/attention. P370 + P378 In case of fire: Use dry powder or dry sand for extinction. 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 in accordance with local / regional / national / international regulations or contact a specialist waste disposal company.
<b>PICTOGRAMS</b>	
<b>Other dangers</b>	NFPA (Risk: 0=No risk; 1=Slight; 2=Moderate; 3=Signifiant; 4=Extreme)
	<b>Health</b> 2 <b>Fire</b> 2 <b>Reactivity</b> 0 <b>Special danger</b>

## SECTION 03 - COMPOSITION/INFORMATION ON INGREDIENTS

Ingrédients (Dénomination chimique / synonymes)	Numéro CAS et tout identificateur unique	Concentration (%)
Orthosilicate de tétraéthyle	78-10-4	<=100

## SECTION 04 - FIRST AID MEASURES

<b>Eye contact</b>	Wash eyes with large amounts of water for at least 15 minutes while holding eyelids apart to rinse eyes. If irritation persists, seek medical attention.
<b>Skin contact</b>	Wash skin with plenty of water for at least 15 minutes. Remove soiled clothing. If irritation persists, seek medical attention.
<b>Inhalation</b>	Move the unwell person to the fresh air. If breathing is difficult, give oxygen. Consult a physician.
<b>Ingestion</b>	Do NOT induce vomiting. If the person is conscious, rinse the mouth with water. Never give anything by mouth to an unconscious person. Consult a physician.
<b>Most important symptoms and effects (acute and delayed)</b>	Ref. section 11.
<b>Immediate medical attention and special treatment, if necessary</b>	In case of medical consultation, keep this sheet available.
<b>General advice</b>	Show this safety data sheet to the doctor in attendance.

## SECTION 05 - FIREFIGHTING MEASURES

<b>Flammability</b>	Yes
<b>Ignition conditions</b>	Heat, sparks and open flame.
<b>Suitable extinguishing media</b>	Dry powder or dry sand.
<b>Unsuitable extinguishing media</b>	Do not use a jet of water.
<b>Hazardous combustion / decomposition products</b>	Hazardous decomposition products formed under fire conditions. Carbon oxides. - silicon oxides.
<b>Special fire and explosion hazards</b>	May react violently with incompatible products (Ref Section 10). Containers exposed to fire may explode. Vapors may form explosive mixtures with air. Vapors may rise to the source of ignition and flash back.
<b>Special protective equipment and precautions for firefighters</b>	Discard incompatible substances if this can be done without risk. Firefighters should be equipped with standard protective equipment, fireproof clothing, face mask, gloves, protective boots and, where appropriate, self-contained breathing apparatus.

## SECTION 06 - ACCIDENTAL RELEASE MEASURES

<b>Methods and materials for containment and cleaning up / Personnel precautions, protective equipment</b>	Evacuate personnel to safe areas. Absorb the product with sand or vermiculite. Dilute residues with water, clean and rinse. Ensure a good ventilation of the premises. Dispose of residues in a container for disposal of hazardous materials. When handling, wear suitable safety equipment. Use breathing apparatus if necessary. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas. Do not let product enter drains.
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## SECTION 07 - HANDLING AND STORAGE

<b>Conditions for safe storage</b>	Keep container tightly closed in a dry and well-ventilated place. Store in cool place. Close all opened containers carefully and store vertically to avoid any flow.
<b>Methods of handling</b>	Avoid contact with the skin, eyes and clothes. Use a hood preferably. Do not breathe dust. Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge. Do not use tools that produce sparks.

## SECTION 08 - EXPOSURE CONTROLS/PERSONAL PROTECTION

### Workplace control parameters

Components	CAS-No.	Value	Control parameters	Basis
TETRAETHYL ORTHOSILICATE	78-10-4	TWA	10 ppm 85 mg/m <sup>3</sup>	Canada. Alberta, Occupational Health and Safety Code (table 2: OEL)
		TWA	10 ppm	Canada. British Columbia OEL
		VEMP	10 ppm 85 mg/m <sup>3</sup>	Québec. Regulation respecting occupational health and safety, Schedule 1, Part 1: Permissible exposure values for airborne contaminants

<b>Data source</b>	Sigma-Aldrich.
<b>Ventilation</b>	Use fan.
<b>Respiratory</b>	If the permissible levels are exceeded, use a mechanical filter / cartridge against NIOSH vapors or a respirator with air supply.
<b>Gloves</b>	Handle with gloves.
<b>Eyes</b>	Safety goggles with safety shutters.
<b>Shoes</b>	Use safety shoes.
<b>Clothing</b>	Labcoat. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.
<b>Engineering control</b>	Have safety showers and eyewash stations in the workplace in case of an emergency and a ventilation system to maintain the level of concentrations in the air below the exposure limit values.

## SECTION 09 - PHYSICAL AND CHEMICAL PROPERTIES

<b>Physical state</b>	Liquid.
<b>Appearance</b>	Incolore.
<b>Odour</b>	Légèrement aromatique.
<b>Odour threshold</b>	85 mg/m <sup>3</sup> .
<b>pH</b>	Données non disponibles.
<b>Melting point / Freezing point</b>	-82.5°C
<b>Initial boiling point</b>	168°C
<b>Boiling range</b>	166-169°C
<b>Flash point</b>	45°C
<b>Evaporation rate</b>	Data not available
<b>Flammability</b>	Yes
<b>Lower flammable / Explosive limit</b>	1.3%
<b>Upper flammable / Explosive limit</b>	23%
<b>Vapour pressure</b>	7.5 mmHg à 20°C.
<b>Vapour density</b>	7.19 (Air = 1.0).
<b>Relative density</b>	0.934g/cm <sup>3</sup>
<b>Solubility</b>	Soluble dans l'éther ; miscible avec l'alcool; légèrement soluble dans le benzène; se décompose dans l'eau.
<b>Partition coefficient water/n-octanol</b>	log Pow : 3.18 à 40°C.
<b>Auto-ignition temperature</b>	222°C
<b>Decomposition temperature</b>	Data not available
<b>Viscosity</b>	0.75 mPa.s à 20°C.

## SECTION 10 - STABILITY AND REACTIVITY

<b>Reactivity</b>	Non-reactive under normal conditions.
<b>Chemical stability</b>	Stable under recommended storage conditions. May decompose on exposure to moist air or water.
<b>Possibility of hazardous reactions</b>	Stable under normal conditions. Reacts with water and forms Ethanol.
<b>Conditions of instability (Including sensitivity to shock / static discharge / vibration)</b>	Exposure to moist air or water. Heat, flames and sparks.
<b>Incompatible material</b>	Strong oxidizing agents, strong acids.
<b>Hazardous decomposition products</b>	Hazardous decomposition products formed under fire conditions. Carbon oxides. - silicon oxides.

## SECTION 11 - TOXICOLOGICAL INFORMATION

### TETRAETHYL ORTHOSILICATE

<b>Routes of exposure</b>	Ingestion, inhalation, skin and eyes.
<b>Acute exposition effects / symptoms:</b>	By exposure route below.
<b>- Eyes</b>	Irritation.
<b>- Skin</b>	Irritation.
<b>- Inhalation</b>	Irritation of the mucous membranes and respiratory tract. Exposure to vapors: dizziness, headache, nausea and vomiting possible; animal: inhalation: tremor, dyspnoea, narcosis, pulmonary edema, death.
<b>Acute toxicity (Ingestion)</b>	To our knowledge, the product has not been fully studied.
<b>Chronic exposure effects / symptoms</b>	Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting. This product has a degreasing action on the skin. It can cause redness, flaking and cracking. If inhaled: damage to kidneys, liver and lungs.
<b>DL50 (specify species and route of entry)</b>	LD50 Oral - Rat - > 2500 mg/kg LD50 Dermal - Rabbit - 5878 mg/kg
<b>CL50 (specify species and route of entry)</b>	CL50 inhalation - Rat 10 mg/L - 4 h (male) 16.8 mg/L - 4 h (female)

## SECTION 12 - ECOLOGICAL INFORMATION

<b>Ecotoxicity</b>	LC50 - Danio rerio (zebra fish) - > 245 mg/L - 96 h - semi-static. EC50 - Daphnia magna (Water flea) - > 75 mg/L - dynamic test EC50 - Pseudokirchneriella subcapitata (green algae) - > 100 mg/L - 72 h - static.
<b>Persistence and degradability</b>	Aerobic Biodegradability - Exposure Duration 28 d Result: 98% - Readily biodegradable.
<b>Bioaccumulative potential</b>	Data not available.
<b>Mobility in soil</b>	Data not available.
<b>Other adverse effects</b>	Data not available.

## SECTION 13 - DISPOSAL CONSIDERATIONS

<b>Waste Disposal Method</b>	Dispose of contents / container in accordance with local / regional / national / international regulations / or contact a specialist waste disposal company.
<b>Contaminated Packaging</b>	Dispose of as unused product.

## SECTION 14 - TRANSPORT INFORMATION

<b>UN Number</b>	1292
<b>UN Proper shipping name</b>	SILICATE DE TÉTRAÉTHYLE
<b>Transport hazard class(es)</b>	3 Flammable liquids
<b>Packing group</b>	III
<b>Limited quantity index</b>	5L
<b>ERAP Index</b>	-
<b>Special precautions</b>	-

## SECTION 15 - REGULATORY INFORMATION

<b>WHIMS CANADA</b>	Flammable liquids category 3 Serious eye damage/ Eye irritation category 2A Acute toxicity - Inhalation category 4 Specific target organ toxicity - Single exposure category 3
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## SECTION 16 - OTHER INFORMATION

### Further information

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. The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. It does not represent any guarantee of the properties of the product. Laboratoire MAT Inc. shall not be held liable for any damage resulting from handling or from contact with the above product.

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