

SILICON TETRACHLORIDE

STC

CAUTIONARY RESPONSE INFORMATION

Common Synonyms Silicon chloride	Liquid Colorless to light yellow Suffocating odor
Reacts violently with water. Irritating gas is produced on contact with water.	
<p>Evacuate. KEEP PEOPLE AWAY. AVOID CONTACT WITH LIQUID AND VAPOR. Wear goggles, self-contained breathing apparatus, and rubber overclothing (including gloves). Notify local health and pollution control agencies. Protect water intakes.</p>	
Fire	Not flammable. DO NOT USE WATER OR FOAM ON ADJACENT FIRES.
Exposure	CALL FOR MEDICAL AID. VAPOR Irritating to eyes, nose and throat. If inhaled will cause difficult breathing. Move victim to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen. LIQUID POISONOUS IF SWALLOWED. Will burn skin and eyes. Remove contaminated clothing and shoes. Flush affected areas with plenty of water. IF IN EYES, hold eyelids open and flush with plenty of water. IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk. DO NOT INDUCE VOMITING.
Water Pollution	Effect of low concentrations on aquatic life is unknown. May be dangerous if it enters water intakes. Notify local health and wildlife officials. Notify operators of nearby water intakes.

1. CORRECTIVE RESPONSE ACTIONS

Dilute and disperse
Stop discharge
Chemical and Physical Treatment:
Neutralize
Do not add water to undissolved material
Pump or dredge contaminated sediment

2. CHEMICAL DESIGNATIONS

2.1 **CG Compatibility Group:** Not listed.
2.2 **Formula:** SiCl₄
2.3 **IMO/UN Designation:** 8/1818
2.4 **DOT ID No.:** 1818
2.5 **CAS Registry No.:** 10026-04-7
2.6 **NAERG Guide No.:** 156
2.7 **Standard Industrial Trade Classification:** 52241

3. HEALTH HAZARDS

- 3.1 **Personal Protective Equipment:** Acid-canister-type gas mask or self-contained breathing apparatus; goggles or face shield; rubber gloves; other protective clothing to prevent contact with skin.
- 3.2 **Symptoms Following Exposure:** Inhalation causes severe irritation of upper respiratory tract resulting in coughing, choking, and a feeling of suffocation; continued inhalation may produce ulceration of the nose, throat, and larynx; if inhaled deeply, edema of the lungs may occur. Contact of liquid with eyes causes severe irritation and painful burns; may cause permanent visual impairment. Liquid may cause severe burns of skin. Repeated skin contact with dilute solutions or exposure to concentrated vapors may cause dermatitis. Ingestion causes severe internal injury with pain in the throat and stomach, intense thirst, difficulty in swallowing, nausea, vomiting, and diarrhea; in severe cases, collapse and unconsciousness may result.
- 3.3 **Treatment of Exposure:** Get medical attention at once following any exposure to this compound.
INHALATION: remove victim from contaminated atmosphere; if breathing has ceased, start mouth-to-mouth resuscitation; oxygen should only be administered by an experienced person when authorized by a physician; keep patient warm and comfortable. **EYES:** immediately flush with large quantities of running water for a minimum of 15 min.; continue irrigation for an additional 15 min. if physician is not available. **SKIN:** immediately flush affected area with water; severe or extensive burns may be caused by silicon tetrachloride, producing shock symptoms (rapid pulse, sweating and collapse); keep patient comfortably warm. **INGESTION:** if patient is conscious give large amounts of lime water or milk of magnesia; plain water should be given if neither of these is available; do NOT give sodium bicarbonate or make any attempt to induce vomiting; if patient is unconscious, do not give anything but ensure there is no obstruction to breathing (tongue should be kept forward and false teeth removed); he will be less likely to aspirate vomitus if placed in a face-downward position.
- 3.4 **TLV-TWA:** Not listed.
3.5 **TLV-STEL:** Not listed.
3.6 **TLV-Ceiling:** Not listed.
3.7 **Toxicity by Ingestion:** Grade 4; LD₅₀ <50 mg/kg
3.8 **Toxicity by Inhalation:** Currently not available.
3.9 **Chronic Toxicity:** Currently not available
3.10 **Vapor (Gas) Irritant Characteristics:** Vapors cause severe irritation of eyes and throat and can cause eye and lung injury. They cannot be tolerated even at low concentrations.
3.11 **Liquid or Solid Characteristics:** Currently not available
3.12 **Odor Threshold:** Currently not available
3.13 **IDLH Value:** Not listed.
3.14 **OSHA PEL-TWA:** Not listed.
3.15 **OSHA PEL-STEL:** Not listed.
3.16 **OSHA PEL-Ceiling:** Not listed.
3.17 **EPA AEGL:** Not listed

4. FIRE HAZARDS

- 4.1 **Flash Point:**
Not flammable
- 4.2 **Flammable Limits in Air:** Not flammable
- 4.3 **Fire Extinguishing Agents:** Not pertinent
- 4.4 **Fire Extinguishing Agents Not to Be Used:** Water or foam on adjacent fires
- 4.5 **Special Hazards of Combustion Products:** Not pertinent
- 4.6 **Behavior in Fire:** Contact with water in foam applied to adjacent fires will produce irritating fumes of hydrogen chloride.
- 4.7 **Auto Ignition Temperature:** Not pertinent
- 4.8 **Electrical Hazards:** Not pertinent
- 4.9 **Burning Rate:** Not pertinent
- 4.10 **Adiabatic Flame Temperature:** Currently not available
- 4.11 **Stoichiometric Air to Fuel Ratio:** Not pertinent.
- 4.12 **Flame Temperature:** Currently not available
- 4.13 **Combustion Molar Ratio (Reactant to Product):** Not pertinent.
- 4.14 **Minimum Oxygen Concentration for Combustion (MOCC):** Not listed

5. CHEMICAL REACTIVITY

- 5.1 **Reactivity with Water:** Reacts vigorously with water to evolve hydrogen chloride (hydrochloric acid)
- 5.2 **Reactivity with Common Materials:** In presence of moisture will corrode metals; the reaction is not violent.
- 5.3 **Stability During Transport:** Stable
- 5.4 **Neutralizing Agents for Acids and Caustics:** Flood with water, rinse with sodium bicarbonate or lime solution.
- 5.5 **Polymerization:** Not pertinent
- 5.6 **Inhibitor of Polymerization:** Not pertinent

6. WATER POLLUTION

- 6.1 **Aquatic Toxicity:**
Currently not available
- 6.2 **Waterfowl Toxicity:** Currently not available
- 6.3 **Biological Oxygen Demand (BOD):** None
- 6.4 **Food Chain Concentration Potential:** None
- 6.5 **GESAMP Hazard Profile:**
Bioaccumulation: 0
Damage to living resources: 1
Human Oral hazard: 1
Human Contact hazard: II
Reduction of amenities: XX

7. SHIPPING INFORMATION

- 7.1 **Grades of Purity:** Technical: 99.7+%; C.P.: 99.9+%
- 7.2 **Storage Temperature:** Ambient
- 7.3 **Inert Atmosphere:** Dry air
- 7.4 **Venting:** Pressure-vacuum
- 7.5 **IMO Pollution Category:** Currently not available
- 7.6 **Ship Type:** Currently not available
- 7.7 **Barge Hull Type:** Currently not available

8. HAZARD CLASSIFICATIONS

- 8.1 **49 CFR Category:** Corrosive material
- 8.2 **49 CFR Class:** 8
- 8.3 **49 CFR Package Group:** II
- 8.4 **Marine Pollutant:** No
- 8.5 **NFPA Hazard Classification:** Not listed
- 8.6 **EPA Reportable Quantity:** Not listed.
- 8.7 **EPA Pollution Category:** Not listed.
- 8.8 **RCRA Waste Number:** Not listed
- 8.9 **EPA FWPCA List:** Not listed

9. PHYSICAL & CHEMICAL PROPERTIES

- 9.1 **Physical State at 15° C and 1 atm:** Liquid
- 9.2 **Molecular Weight:** 169.9
- 9.3 **Boiling Point at 1 atm:** 135.7°F = 57.6°C = 330.8°K
- 9.4 **Freezing Point:** -94°F = -70°C = 203°K
- 9.5 **Critical Temperature:** 452.5°F = 233.6°C = 506.8°K
- 9.6 **Critical Pressure:** 542 psia = 36.8 atm = 3.74 MN/m²
- 9.7 **Specific Gravity:** 1.48 at 20°C (liquid)
- 9.8 **Liquid Surface Tension:** 19.6 dynes/cm = 0.0196 N/m at 20°C
- 9.9 **Liquid Water Interfacial Tension:** Not pertinent
- 9.10 **Vapor (Gas) Specific Gravity:** 5.86
- 9.11 **Ratio of Specific Heats of Vapor (Gas):** Currently not available
- 9.12 **Latent Heat of Vaporization:** 74.2 Btu/lb = 41.2 cal/g = 1.73 X 10⁵ J/kg
- 9.13 **Heat of Combustion:** Not pertinent
- 9.14 **Heat of Decomposition:** Not pertinent
- 9.15 **Heat of Solution:** -742 Btu/lb = -412 cal/g = -17.3 X 10⁵ J/kg
- 9.16 **Heat of Polymerization:** Not pertinent
- 9.17 **Heat of Fusion:** Currently not available
- 9.18 **Limiting Value:** Currently not available
- 9.19 **Reid Vapor Pressure:** Currently not available

NOTES

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9.20 SATURATED LIQUID DENSITY		9.21 LIQUID HEAT CAPACITY		9.22 LIQUID THERMAL CONDUCTIVITY		9.23 LIQUID VISCOSITY	
Temperature (degrees F)	Pounds per cubic foot	Temperature (degrees F)	British thermal unit per pound-F	Temperature (degrees F)	British thermal unit inch per hour-square foot-F	Temperature (degrees F)	Centipoise
35	94.669	35	0.190	52	0.957	10	0.625
40	94.330	40	0.190	54	0.957	15	0.611
45	93.980	45	0.190	56	0.957	20	0.597
50	93.629	50	0.190	58	0.957	25	0.584
55	93.290	55	0.190	60	0.957	30	0.572
60	92.940	60	0.190	62	0.957	35	0.559
65	92.589	65	0.190	64	0.957	40	0.548
70	92.250	70	0.190	66	0.957	45	0.537
75	91.900	75	0.190	68	0.957	50	0.526
80	91.549	80	0.190	70	0.957	55	0.516
85	91.209	85	0.190	72	0.957	60	0.506
90	90.860	90	0.190	74	0.957	65	0.496
95	90.509	95	0.190	76	0.957	70	0.487
100	90.169	100	0.190	78	0.957	75	0.478
				80	0.957	80	0.470
				82	0.957	85	0.462
				84	0.957	90	0.454
				86	0.957	95	0.446
				88	0.957	100	0.439

9.24 SOLUBILITY IN WATER		9.25 SATURATED VAPOR PRESSURE		9.26 SATURATED VAPOR DENSITY		9.27 IDEAL GAS HEAT CAPACITY	
Temperature (degrees F)	Pounds per 100 pounds of water	Temperature (degrees F)	Pounds per square inch	Temperature (degrees F)	Pounds per cubic foot	Temperature (degrees F)	British thermal unit per pound-F
	R	15	0.931	15	0.03104		N
	E	20	1.073	20	0.03539		O
	A	25	1.232	25	0.04024		T
	C	30	1.412	30	0.04562		
	T	35	1.612	35	0.05159		P
	S	40	1.837	40	0.05819		E
		45	2.088	45	0.06547		R
		50	2.366	50	0.07349		T
		55	2.676	55	0.08229		I
		60	3.019	60	0.09194		N
		65	3.398	65	0.10250		E
		70	3.815	70	0.11400		N
		75	4.275	75	0.12660		T
		80	4.781	80	0.14020		
		85	5.335	85	0.15500		
		90	5.941	90	0.17110		
		95	6.604	95	0.18840		
		100	7.327	100	0.20720		
		105	8.113	105	0.22740		
		110	8.969	110	0.24920		
		115	9.897	115	0.27260		
		120	10.900	120	0.29770		
		125	11.990	125	0.32460		
		130	13.170	130	0.35340		
		135	14.430	135	0.38410		
		140	15.800	140	0.41700		