

VANADIUM OXYTRICHLORIDE

VOT

CAUTIONARY RESPONSE INFORMATION

Common Synonyms Trichlorooxovanadium Vanadyl chloride Vanadyl trichloride	Liquid Lemon yellow Sharp unpleasant odor
Sinks and mixes violently with water.	
<p>KEEP PEOPLE AWAY. AVOID CONTACT WITH LIQUID AND VAPOR. Wear rubber overclothing (including gloves). Notify local health and pollution control agencies. Protect water intakes. Do not add water to undissolved chemical.</p>	
Fire	Not flammable. DO NOT USE WATER ON ADJACENT FIRES.
Exposure	CALL FOR MEDICAL AID. VAPOR Irritating to eyes, nose and throat. If inhaled will cause coughing or difficult breathing. If in eyes, hold eyelids open and flush with plenty of water. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen. LIQUID POISONOUS IF SWALLOWED OR IF SKIN IS EXPOSED. Irritating to skin and eyes. Harmful if swallowed. 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. IF SWALLOWED and victim is UNCONSCIOUS OR HAVING CONVULSIONS, do nothing except keep victim warm.
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 dissolved material Stop discharge Chemical and Physical Treatment: Neutralize Do not add water to undissolved material	2. CHEMICAL DESIGNATIONS 2.1 CG Compatibility Group: Not listed. 2.2 Formula: VCl ₃ 2.3 IMO/UN Designation: Not listed 2.4 DOT ID No.: 2443 2.5 CAS Registry No.: 7727-18-6 2.6 NAERG Guide No.: 137 2.7 Standard Industrial Trade Classification: 52329
3. HEALTH HAZARDS	
3.1 Personal Protective Equipment: Acid vapor mask; rubber gloves; face shield; acid-resistant clothing	
3.2 Symptoms Following Exposure: Inhalation of vapor causes irritation of nose and throat. Ingestion causes irritation of mouth and stomach. Contact with eyes or skin causes severe irritation.	
3.3 Treatment of Exposure: Consult a physician after all exposures to this compound. INHALATION: move to fresh air; give artificial respiration if necessary. INGESTION: give large amount of water. EYES: flush with water for 15 min. SKIN: wipe exposed areas free of the chemical with a dry cloth, then flush thoroughly with water.	
3.4 TLV-TWA: Not listed.	
3.5 TLV-STEL: Not listed.	
3.6 TLV-Ceiling: Not listed.	
3.7 Toxicity by Ingestion: Grade 3; oral rat LD ₅₀ = 140 mg/kg	
3.8 Toxicity by Inhalation: Currently not available.	
3.9 Chronic Toxicity: Repeated exposures may cause discoloration of tongue, loss of appetite, anemia, kidney disorders, and blindness.	
3.10 Vapor (Gas) Irritant Characteristics: Currently not available 5.9 Currently not available 5.10 10 ppm HCl, based on decomposition of compound in moist air	
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, unless in flooding amounts, should not be used on adjacent fires.
- 4.5 **Special Hazards of Combustion**
Products: Irritating fumes of hydrogen chloride may form in fires.
- 4.6 **Behavior in Fire:** Currently not available
- 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 to form a solution of hydrochloric acid
- 5.2 **Reactivity with Common Materials:** In presence of moisture will corrode most metals
- 5.3 **Stability During Transport:** Stable
- 5.4 **Neutralizing Agents for Acids and Caustics:** Flush with water and sprinkle with powdered limestone or rinse with dilute solution of sodium bicarbonate or soda ash.
- 5.5 **Polymerization:** Not pertinent
- 5.6 **Inhibitor of Polymerization:** Not pertinent

6. WATER POLLUTION

- 6.1 **Aquatic Toxicity:**
See vanadyl sulfate
- 6.2 **Waterfowl Toxicity:** Currently not available
- 6.3 **Biological Oxygen Demand (BOD):** None
- 6.4 **Food Chain Concentration Potential:** Currently not available
- 6.5 **GESAMP Hazard Profile:**
Bioaccumulation: 0
Damage to living resources: (2)
Human Oral hazard: 2
Human Contact hazard: II
Reduction of amenities: XX

7. SHIPPING INFORMATION

- 7.1 **Grades of Purity:** Technical, 99%
- 7.2 **Storage Temperature:** Ambient
- 7.3 **Inert Atmosphere:** No requirement
- 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:**
- | Category | Classification |
|---------------------------|----------------|
| Health Hazard (Blue)..... | 3 |
| Flammability (Red)..... | 0 |
| Instability (Yellow)..... | 2 |
- 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:** 173.3
- 9.3 **Boiling Point at 1 atm:** 259°F = 126°C = 399°K
- 9.4 **Freezing Point:** -107°F = -77°C = 196°K
- 9.5 **Critical Temperature:** Currently not available
- 9.6 **Critical Pressure:** Currently not available
- 9.7 **Specific Gravity:** 1.83 at 20°C (liquid)
- 9.8 **Liquid Surface Tension:** Currently not available
- 9.9 **Liquid Water Interfacial Tension:** Not pertinent
- 9.10 **Vapor (Gas) Specific Gravity:** 5.98
- 9.11 **Ratio of Specific Heats of Vapor (Gas):** Currently not available
- 9.12 **Latent Heat of Vaporization:** Currently not available
- 9.13 **Heat of Combustion:** Not pertinent
- 9.14 **Heat of Decomposition:** Not pertinent
- 9.15 **Heat of Solution:** Currently not available
- 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	116.500	0	0.125		N		N
40	116.200	5	0.125		O		O
45	115.900	10	0.125		T		T
50	115.599	15	0.125				
55	115.299	20	0.125		P		P
60	115.000	25	0.125		E		E
65	114.700	30	0.125		R		R
70	114.400	35	0.125		T		T
75	114.000	40	0.125		I		I
80	113.700	45	0.125		N		N
85	113.400	50	0.125		E		E
90	113.099	55	0.125		N		N
95	112.799	60	0.125		T		T
100	112.500	65	0.125				
		70	0.125				
		75	0.125				
		80	0.125				
		85	0.125				
		90	0.125				
		95	0.125				
		100	0.125				

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	60	0.190	60	0.00591		N
	E	70	0.256	70	0.00780		O
	A	80	0.340	80	0.01018		T
	C	90	0.448	90	0.01316		
	T	100	0.584	100	0.01686		P
	S	110	0.755	110	0.02140		E
		120	0.967	120	0.02693		R
		130	1.228	130	0.03361		T
		140	1.547	140	0.04163		I
		150	1.933	150	0.05120		N
		160	2.400	160	0.06252		E
		170	2.958	170	0.07585		N
		180	3.623	180	0.09144		T
		190	4.409	190	0.10960		
		200	5.335	200	0.13060		
		210	6.417	210	0.15470		
		220	7.678	220	0.18240		
		230	9.139	230	0.21390		
		240	10.920	240	0.24970		
		250	12.760	250	0.29020		
		260	14.970	260	0.33580		