

BUTYLTRICHLOROSILANE

BCS

CAUTIONARY RESPONSE INFORMATION

Common Synonyms n-Butyltrichlorosilane	Liquid Reacts violently with water. Irritating visible vapor cloud is produced.	Colorless Sharp, irritating odor
<p>Restrict access. Evacuate. AVOID CONTACT WITH LIQUID AND VAPOR. Wear goggles, self-contained breathing apparatus and rubber overclothing (including gloves). Call fire department. Notify local health and pollution control agencies. Protect water intakes.</p>		
Fire	Combustible. POISONOUS GASES MAY BE PRODUCED IN FIRE. Extinguish with dry chemicals or carbon dioxide. DO NOT USE WATER OR FOAM ON FIRE.	
Exposure	Call for medical aid. VAPOR Irritating to eyes, nose and throat. Harmful if inhaled. Move victim to fresh air. If breathing is difficult, give oxygen. LIQUID Will burn 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. 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

2. CHEMICAL DESIGNATIONS

- 2.1 CG Compatibility Group: Not listed.
2.2 Formula: CH3CH2CH2CH2SiCl3
2.3 IMO/UN Designation: 8/1747
2.4 DOT ID No.: 1747
2.5 CAS Registry No.: Currently not available
2.6 NAERG Guide No.: 155
2.7 Standard Industrial Trade Classification: 51550

3. HEALTH HAZARDS

- 3.1 Personal Protective Equipment: Acid-vapor-type respiratory protection; rubber gloves, chemical worker's goggles, and other protective equipment as necessary to protect skin and eyes.
3.2 Symptoms Following Exposure: Inhalation of vapor irritates upper respiratory system. Contact of liquid with eyes or skin causes severe burns. Ingestion causes burns of mouth and stomach.
3.3 Treatment of Exposure: Seek medical attention after all exposures to this compound. INHALATION: remove to fresh air; apply artificial respiration if required. EYES: flush with water for 15 min. SKIN: flush with water. INGESTION: do NOT induce vomiting; give large amounts of water.
3.4 TLV-TWA: Not listed.
3.5 TLV-STEL: Not listed.
3.6 TLV-Ceiling: Not listed.
3.7 Toxicity by Ingestion: Currently not available.
3.8 Toxicity by Inhalation: Currently not available.
3.9 Chronic Toxicity: Currently not available.
3.10 Vapor (Gas) Irritant Characteristics: Currently not available.
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: 130°F O.C. 126°F C.C.
4.2 Flammable Limits in Air: Currently not available
4.3 Fire Extinguishing Agents: Dry chemical, carbon dioxide
4.4 Fire Extinguishing Agents Not to Be Used: Water, foam
4.5 Special Hazards of Combustion Products: Hydrogen chloride, chlorine, or phosgene may be formed.
4.6 Behavior in Fire: Difficult to extinguish. Re-ignition may occur.
4.7 Auto Ignition Temperature: Currently not available
4.8 Electrical Hazards: Currently not available
4.9 Burning Rate: 2.2 mm/min.
4.10 Adiabatic Flame Temperature: Currently not available
4.11 Stoichiometric Air to Fuel Ratio: 30.9 (calc.)
4.12 Flame Temperature: Currently not available
4.13 Combustion Molar Ratio (Reactant to Product): 11.0 (calc.)
4.14 Minimum Oxygen Concentration for Combustion (MOCC): Not listed

5. CHEMICAL REACTIVITY

- 5.1 Reactivity with Water: Reacts vigorously to generate hydrogen chloride (hydrochloric acid).
5.2 Reactivity with Common Materials: Will react with common metals to evolve hydrogen chloride and cause severe corrosion.
5.3 Stability During Transport: Stable
5.4 Neutralizing Agents for Acids and Caustics: Flush 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): Currently not available
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: 95+%
- 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).....	2
Flammability (Red).....	2
Instability (Yellow).....	0

- 8.6 EPA Reportable Quantity: Not listed.

- 8.7 EPA Pollution Category: Not listed.

- 8.8 RCRA Waste Number: Not listed

- 8.9 EPA FWCRA List: Not listed

9. PHYSICAL & CHEMICAL PROPERTIES

- 9.1 Physical State at 15°C and 1 atm: Liquid

- 9.2 Molecular Weight: 191.5

- 9.3 Boiling Point at 1 atm: 288°F = 142°C = 415°K

- 9.4 Freezing Point: Not pertinent

- 9.5 Critical Temperature: Not pertinent

- 9.6 Critical Pressure: Not pertinent

- 9.7 Specific Gravity: 1.16 at 20°C (liquid)

- 9.8 Liquid Surface Tension: (est.) 25 dynes/cm = 0.025 N/m at 20°C

- 9.9 Liquid Water Interfacial Tension: Not pertinent

- 9.10 Vapor (Gas) Specific Gravity: 6.5

- 9.11 Ratio of Specific Heats of Vapor (Gas): Not pertinent

- 9.12 Latent Heat of Vaporization: (est.) 81

- Btu/lb = 45 cal/g = 1.9 X 10³ J/kg

- 9.13 Heat of Combustion: (est.) -4,300 Btu/lb = -2,400 cal/g = -100 X 10³ J/kg

- 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
42	73.570	51	0.300	50	0.783	51	4.064
44	73.490	52	0.300	52	0.783	52	4.005
46	73.410	53	0.300	54	0.783	53	3.948
48	73.330	54	0.300	56	0.783	54	3.892
50	73.250	55	0.300	58	0.783	55	3.836
52	73.169	56	0.300	60	0.783	56	3.782
54	73.080	57	0.300	62	0.783	57	3.729
56	73.000	58	0.300	64	0.783	58	3.677
58	72.919	59	0.300	66	0.783	59	3.625
60	72.839	60	0.300	68	0.783	60	3.575
62	72.759	61	0.300	70	0.783	61	3.525
64	72.679	62	0.300	72	0.783	62	3.476
66	72.599	63	0.300	74	0.783	63	3.428
68	72.520	64	0.300	76	0.783	64	3.381
70	72.440	65	0.300	78	0.783	65	3.335
72	72.360	66	0.300	80	0.783	66	3.290
74	72.280	67	0.300	82	0.783	67	3.245
76	72.200	68	0.300	84	0.783	68	3.201
		69	0.300	86	0.783	69	3.158
		70	0.300	88	0.783	70	3.116
		71	0.300			71	3.074
		72	0.300			72	3.033
		73	0.300			73	2.993
		74	0.300			74	2.954
		75	0.300			75	2.915
		76	0.300			76	2.877

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		70	0.406	70	0.01367	N	
E		80	0.510	80	0.01687	O	
A		90	0.636	90	0.02064	T	
C		100	0.786	100	0.02506	P	
T		110	0.965	110	0.03022	E	
S		120	1.176	120	0.03619	R	
		130	1.423	130	0.04306	T	
		140	1.712	140	0.05093	I	
		150	2.047	150	0.05990	N	
		160	2.433	160	0.07005	E	
		170	2.876	170	0.08149	N	
		180	3.383	180	0.09433	E	
		190	3.958	190	0.10870	N	
		200	4.609	200	0.12470	E	
		210	5.344	210	0.14230	N	
		220	6.168	220	0.16190	E	
		230	7.089	230	0.18340	N	
		240	8.117	240	0.20700	E	
		250	9.257	250	0.23270	N	
		260	10.520	260	0.26080	E	
		270	11.910	270	0.29120	N	
		280	13.440	280	0.32420	E	