



AIR LIQUIDE

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Document Number: 15097



AIR LIQUIDE

**MANUFACTURED/SUPPLIED FOR:
ADDRESS:**

2700 Post Oak Drive
Houston, TX 77056-8229

EMERGENCY PHONE:

CHEMTREC: 1-800-424-9300

BUSINESS PHONE:

General MSDS Info :1-713/896-2896
Fax on Demand: 1-800/231-1366

SUBSTANCE: 2 COMP. MIX SILANE >1% BAL. INERT GAS

CREATION DATE: Sep 28 1990

REVISION DATE: Dec 15 2003

2. COMPOSITION, INFORMATION ON INGREDIENTS

COMPONENT: SILANE

CAS NUMBER: 7803-62-5

EC NUMBER (EINECS): 232-263-4

PERCENTAGE: >1.0

COMPONENT: ARGON, COMPRESSED

CAS NUMBER: 7440-37-1

EC NUMBER (EINECS): 231-147-0

PERCENTAGE: 0-99.0

COMPONENT: HELIUM

CAS NUMBER: 7440-59-7

EC NUMBER (EINECS): 231-168-5

PERCENTAGE: 0-99.0

COMPONENT: NITROGEN, COMPRESSED GAS

CAS NUMBER: 7727-37-9

EC NUMBER (EINECS): 231-783-9

PERCENTAGE: 0-99.0

COMPONENT: NEON

CAS NUMBER: 7440-01-9
EC NUMBER (EINECS): 231-110-9
PERCENTAGE: 0-99.0

3. HAZARDS IDENTIFICATION

NFPA RATINGS (SCALE 0-4): HEALTH=2 FIRE=4 REACTIVITY=2

EMERGENCY OVERVIEW:

PHYSICAL DESCRIPTION: Gas.

MAJOR HEALTH HAZARDS: respiratory tract irritation, skin irritation, eye irritation, difficulty breathing

PHYSICAL HAZARDS: Flammable gas. May cause flash fire. Extremely flammable. May ignite spontaneously on exposure to air. May react on contact with air, heat, light or water.

POTENTIAL HEALTH EFFECTS:

INHALATION:

SHORT TERM EXPOSURE: irritation, nausea, vomiting, difficulty breathing, irregular heartbeat, headache, drowsiness, fatigue, dizziness, disorientation, emotional disturbances, mood swings, tingling sensation, loss of coordination, suffocation, convulsions, unconsciousness, coma

LONG TERM EXPOSURE: no information on significant adverse effects

SKIN CONTACT:

SHORT TERM EXPOSURE: irritation

LONG TERM EXPOSURE: irritation

EYE CONTACT:

SHORT TERM EXPOSURE: irritation

LONG TERM EXPOSURE: irritation

INGESTION:

SHORT TERM EXPOSURE: ingestion of a gas is unlikely, ingestion of harmful amounts is unlikely

LONG TERM EXPOSURE: ingestion of a gas is unlikely, ingestion of harmful amounts is unlikely

CARCINOGEN STATUS:

OSHA: No

NTP: No

IARC: No

4. FIRST AID MEASURES

INHALATION: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.

SKIN CONTACT: If frostbite or freezing occur, immediately flush with plenty of lukewarm water (105-115 F; 41-46 C). DO NOT USE HOT WATER. If warm water is not available, gently wrap affected parts in blankets. Get immediate medical attention.

EYE CONTACT: Flush eyes with plenty of water.

INGESTION: If a large amount is swallowed, get medical attention.

NOTE TO PHYSICIAN: For inhalation, consider oxygen.

5. FIRE FIGHTING MEASURES

FIRE AND EXPLOSION HAZARDS: Severe fire hazard. Severe explosion hazard. Vapor/air mixtures are explosive. Containers may rupture or explode if exposed to heat. Electrostatic discharges may be generated by flow or agitation resulting in ignition or explosion.

EXTINGUISHING MEDIA: carbon dioxide, regular dry chemical

Large fires: Flood with fine water spray.

FIRE FIGHTING: Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks. For fires in cargo or storage area: Cool containers with water from unmanned hose holder or monitor nozzles until well after fire is out. If this is impossible then take the following precautions: Keep unnecessary people away, isolate hazard area and deny entry. Let the fire burn. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire. For tank, rail car or tank truck: Stop leak if possible without personal risk. Let burn unless leak can be stopped immediately. For smaller tanks or cylinders, extinguish and isolate from other flammables. Evacuation radius: 800 meters (1/2 mile). Do not attempt to extinguish fire unless flow of material can be stopped first. Flood with fine water spray. Cool containers with water spray until well after the fire is out. Apply water from a protected location or from a safe distance. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas. Evacuate if fire gets out of control or containers are directly exposed to fire. Evacuation radius: 500 meters (1/3 mile). Consider downwind evacuation if material is leaking.

6. ACCIDENTAL RELEASE MEASURES

OCCUPATIONAL RELEASE:

Avoid heat, flames, sparks and other sources of ignition. Do not touch spilled material. Stop leak if possible without personal risk. Reduce vapors with water spray. Keep unnecessary people away, isolate hazard area and deny entry. Remove sources of ignition. Ventilate closed spaces before entering.

7. HANDLING AND STORAGE

STORAGE: Store and handle in accordance with all current regulations and standards. Subject to storage regulations: U.S. OSHA 29 CFR 1910.101. Grounding and bonding required. Keep separated from incompatible substances.

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

EXPOSURE LIMITS:

SILANE:

5 ppm (7 mg/m3) OSHA TWA (vacated by 58 FR 35338, June 30, 1993)
5 ppm ACGIH TWA
5 ppm (7 mg/m3) NIOSH recommended TWA 10 hour(s)
0.5 ppm (0.67 mg/m3) UK OES TWA
1 ppm (1.3 mg/m3) UK OES STEL

ARGON, COMPRESSED:

ARGON:

ACGIH (simple asphyxiant)
UK OES (simple asphyxiant)

HELIUM:

ACGIH (simple asphyxiant)
UK OES (simple asphyxiant)

NITROGEN, COMPRESSED GAS:

NITROGEN:

ACGIH (simple asphyxiant)
UK OES (simple asphyxiant)

NEON:

ACGIH (simple asphyxiant)
UK OES (simple asphyxiant)

VENTILATION: Based on available information, additional ventilation is not required. Ensure compliance with applicable exposure limits.

EYE PROTECTION: For the gas: Eye protection not required, but recommended. For the liquid: Wear splash resistant safety goggles. Contact lenses should not be worn. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

CLOTHING: For the gas: Protective clothing is not required. For the liquid: Wear appropriate protective, cold insulating clothing.

GLOVES: Wear insulated gloves.

RESPIRATOR: Under conditions of frequent use or heavy exposure, respiratory protection may be needed. Respiratory protection is ranked in order from minimum to maximum. Consider warning properties before use.

For Unknown Concentrations or Immediately Dangerous to Life or Health -

Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply.

Any self-contained breathing apparatus with a full facepiece.

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL DESCRIPTION: Gas.

BOILING POINT: Not available

FREEZING POINT: Not available

VAPOR PRESSURE: Not available

VAPOR DENSITY: Not available
DENSITY: Not available
WATER SOLUBILITY: Not available
PH: Not applicable
VOLATILITY: Not applicable
ODOR THRESHOLD: Not available
EVAPORATION RATE: Not applicable
COEFFICIENT OF WATER/OIL DISTRIBUTION: Not applicable

10. STABILITY AND REACTIVITY

REACTIVITY: May ignite on exposure to air.

CONDITIONS TO AVOID: Avoid heat, flames, sparks and other sources of ignition.
Minimize contact with material. Containers may rupture or explode if exposed to heat.

INCOMPATIBILITIES: metal salts, bases, halogens, oxidizing materials, metals

SILANE:

ANTIMONY PENTACHLORIDE: Ignition.
BASES: May decompose releasing flammable hydrogen gas.
BROMINE: Ignition or explosive reaction.
CARBONYL CHLORIDES: Explosive reaction.
CHLORINE: Ignition or explosive reaction.
COVALENT CHLORIDES: Ignition.
FLUORINE: Ignition or explosive reaction.
HALOGENS: Ignition or explosive reaction.
NITROUS OXIDE: Explosive reaction.
OXIDIZERS (STRONG): Fire and explosion hazard.
OXYGEN: May ignite.
POTASSIUM HYDROXIDE: Decomposes, releasing flammable hydrogen gas.
TIN(IV) CHLORIDE: Ignition.

HELIUM:

No data available.

NITROGEN:

LITHIUM: May ignite in the gas.
MAGNESIUM: Violent reaction with the liquid on ignition.
NEODYMIUM: Vigorous reaction.
OZONE: Mixtures of the gases may be explosive.
TITANIUM: Will burn in nitrogen atmosphere.

NEON:

No data available.

ARGON:

No data available.

HAZARDOUS DECOMPOSITION:

Thermal decomposition products: miscellaneous decomposition products

POLYMERIZATION: Will not polymerize.

11. TOXICOLOGICAL INFORMATION

SILANE:

TOXICITY DATA:

9600 ppm/4 hour(s) inhalation-rat LC50; 9600 ppm/4 hour(s) inhalation-mouse LCLo

LOCAL EFFECTS:

Irritant: inhalation, skin, eye

ACUTE TOXICITY LEVEL:

Slightly Toxic: inhalation

MUTAGENIC DATA:

mutation in microorganisms - Salmonella typhimurium 1 pph (+/-S9)

HEALTH EFFECTS:

INHALATION:

2 COMP. MIX SILANE >1% BAL. INERT GAS: For health effects of hydrogen, see health information on simple asphyxiants.

NITROGEN: Nitrogen inhaled under increased atmospheric pressure, (>1.5 atmospheres), may dissolve in the fat-containing brain cells, and act as an anesthetic, causing narcosis. Persons who have been exposed to increased pressure for a time and who are suddenly released from the pressure may develop decompression sickness. Repeated exposure, without complete decompression, may result in decompression sickness. See information on simple asphyxiants.

ACUTE EXPOSURE:

SILANE: Inhalation may cause mucous membrane irritation, headache and nausea. Rats exposed at 126 ppm for 1 hour were apparently unaffected. In another study, six rats also survived a 6 hour exposure at 1400 ppm.

SIMPLE ASPHYXIANTS: The symptoms of asphyxia depend on the rapidity with which the oxygen deficiency develops and how long it continues. In sudden acute asphyxia, unconsciousness may be immediate. With slow development there may be rapid respiration and pulse, air hunger, dizziness, reduced awareness, tightness in the head, tingling sensations, incoordination, faulty judgement, emotional instability, and rapid fatigue. As the asphyxia progresses, nausea, vomiting, collapse, unconsciousness, convulsions, deep coma and death are possible.

CHRONIC EXPOSURE:

SILANE: May cause silicosis with shortness of breath.

SIMPLE ASPHYXIANTS: No data available.

SKIN CONTACT:

ACUTE EXPOSURE:

SILANE: Contact with vapors may cause irritation. Due to rapid evaporation, the liquid may cause frostbite with redness, tingling and pain or numbness. In more severe cases, the skin may become hard and white and develop blisters.

SIMPLE ASPHYXIANTS: No adverse effects have been reported from the gas. Due to rapid evaporation, the liquid may cause frostbite with redness, tingling and pain or numbness. In more severe cases, the skin may become

hard and white and develop blisters.

CHRONIC EXPOSURE:

SILANE: Repeated or prolonged exposure to irritants may cause dermatitis.

SIMPLE ASPHYXIANTS: No data available.

EYE CONTACT:

ACUTE EXPOSURE:

SILANE: Contact with vapors may cause irritation. Due to rapid evaporation, the liquid may cause frostbite with redness, pain and blurred vision.

SIMPLE ASPHYXIANTS: No adverse effects have been reported from the gas. Due to evaporation, the liquid may cause frostbite with redness, pain, and blurred vision.

CHRONIC EXPOSURE:

SILANE: Repeated or prolonged contact with irritants may cause conjunctivitis.

SIMPLE ASPHYXIANTS: No data available.

INGESTION:

ACUTE EXPOSURE:

SILANE: Ingestion of a gas is unlikely. If the liquid is swallowed, frostbite damage to the lips, mouth and mucous membranes may occur.

SIMPLE ASPHYXIANTS: Ingestion of a gas is unlikely. If liquid is swallowed, frostbite damage to the lips, mouth and mucous membranes may occur.

CHRONIC EXPOSURE:

SILANE: No data available.

SIMPLE ASPHYXIANTS: No data available.

12. ECOLOGICAL INFORMATION

Not available

13. DISPOSAL CONSIDERATIONS

Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): D001. D003. Dispose in accordance with all applicable regulations.

14. TRANSPORT INFORMATION

U.S. DOT 49 CFR 172.101:

PROPER SHIPPING NAME: Compressed gas, flammable, n.o.s. (silane)

ID NUMBER: UN1954
HAZARD CLASS OR DIVISION: 2.1
LABELING REQUIREMENTS: 2.1
QUANTITY LIMITATIONS:
PASSENGER AIRCRAFT OR RAILCAR: Forbidden
CARGO AIRCRAFT ONLY: 150 kg

CANADIAN TRANSPORTATION OF DANGEROUS GOODS: No classification assigned.

LAND TRANSPORT ADR: No classification assigned.

LAND TRANSPORT RID:
PROPER SHIPPING NAME: Compressed gas, flammable, n.o.s.
UN NUMBER: UN1954
CLASS: 2
CLASSIFICATION CODE: 1F
LABELS: 2.1; (+13)

AIR TRANSPORT IATA:
PROPER SHIPPING NAME: Compressed gas, flammable, n.o.s.
UN/ID NUMBER: UN1954
CLASS OR DIVISION: 2.1
HAZARD LABELS: 2.1

AIR TRANSPORT ICAO:
PROPER SHIPPING NAME: Compressed gas, flammable, n.o.s.
UN NUMBER: UN1954
CLASS OR DIVISION: 2.1
LABELS: 2.1

MARITIME TRANSPORT IMDG:
PROPER SHIPPING NAME: Compressed gas, flammable, n.o.s.
UN NUMBER: UN1954
CLASS OR DIVISION: 2.1

15. REGULATORY INFORMATION

U.S. REGULATIONS:
CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4): Not regulated.

SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.30):
Not regulated.

SARA TITLE III SECTION 304 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.40):
Not regulated.

SARA TITLE III SARA SECTIONS 311/312 HAZARDOUS CATEGORIES (40 CFR 370.21):
ACUTE: Yes
CHRONIC: No
FIRE: Yes
REACTIVE: No
SUDDEN RELEASE: Yes

SARA TITLE III SECTION 313 (40 CFR 372.65): Not regulated.

OSHA PROCESS SAFETY (29CFR1910.119): Not regulated.

STATE REGULATIONS:

California Proposition 65: Not regulated.

CANADIAN REGULATIONS:

WHMIS CLASSIFICATION: Not determined.

EUROPEAN REGULATIONS:

EC CLASSIFICATION (CALCULATED): Not determined.

NATIONAL INVENTORY STATUS:

U.S. INVENTORY (TSCA): Listed on inventory.

TSCA 12(b) EXPORT NOTIFICATION: Not listed.

16. OTHER INFORMATION

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