SECTION-1: Identification of the substance / mixture and the company / undertaking

Catalogue Number	CS-T-87359
Product Name	Sulfuryl Chloride
CAS No.	7791-25-5
Category	Fine Chemicals
Synonyms	Sulfuryl Chloride
Brand	Clearsynth Labs Ltd.
Identified uses	Laboratory Chemicals
Uses advised against	Not available
Company	Clearsynth Labs Ltd. Mumbai, India
Emergency Phone #	+91-22-245045900
REACH No.	Not available

SECTION 2: Hazards identification

Disclaimer: This is sample MSDS. Please email **sales@clearsynth.com** for more details.

2.1 Classification of the substance or mixture-Regulation (EC) No 1272/2008:

Not available

2.2 Label Elements

Signal Word: Warning

Hazard Statement(s)

Code	Statement
H314	Not available
H335	Not available
H318	Causes serious eye damage.
H330	Not available

H370	Not available
H372	Not available

Precautionary Statement(s)

Code	Statement
P260	Not available
P261	Avoid breathing dust/fume/gas/mist/vapours/spray.
P264	Wash hands thoroughly after handling.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P301+P330+P331	Not available
P302+P361+P354	Not available
P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305+P354+P338	Not available
P316	Not available
P319	Get medical help if you feel unwell.
P321	Specific treatment (see … on this label).
P363	Not available
P403+P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.
P501	Dispose of contents/container in accordance with local/regional/national/international regulatio
P264+P265	Not available
P284	Not available
P317	Not available
P320	Not available
P270	Not available
P308+P316	Not available

SECTION 3: Composition / information on ingredients

3.1 Substance

Component : Sulfuryl Chloride

CAS Number : 7791-25-5
Molecular Formula : Cl2O2S
Molecular Weight : 134.96
Parent Chemical : -
Synonyms : Sulfuryl Chloride
Concentration : Not available

SECTION 4: First aid measures

SECTION 4: First-aid measures

4.1 Description of first aid measures
General advice: Remove from exposure. Show this safety data sheet to the doctor in attendance.
Inhalation: Move person to fresh air. Keep at rest in a position comfortable for breathing. If breathing is difficult, trained personnel should administer oxygen. If not breathing, give artificial respiration by trained personnel. Get immediate medical attention.
Skin contact: Immediately remove contaminated clothing and shoes. Rinse skin with plenty of water for at least 15 minutes. Do not reuse contaminated clothing until laundered. Get immediate medical attention.
Eye contact: Immediately flush eyes with plenty of water for at least 15 minutes, lifting upper and lower eyelids occasionally. Remove contact lenses if present and easy to do. Get immediate medical attention.
Ingestion: Rinse mouth with water if conscious. Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Get immediate medical attention.

4.2 Most important symptoms and effects, both acute and delayed
Corrosive; causes severe burns to skin and eyes. Harmful if inhaled; may cause severe irritation and damage to respiratory tract. Symptoms may be delayed. No data available for additional specific symptoms.

4.3 Indication of any immediate medical attention and special treatment needed
Treat symptomatically. Immediate medical attention required for all exposure routes. No data available on specific antidote.

SECTION 5: Firefighting measures

SECTION 5: Fire-fighting measures

5.1 Extinguishing media
Suitable extinguishing media: Use extinguishing media appropriate for surrounding fire (e.g., dry chemical, carbon dioxide, alcohol-resistant foam).
Unsuitable extinguishing media: No data available.

5.2 Special hazards arising from the substance or mixture
Not combustible, but may decompose on heating to release toxic and corrosive gases/fumes. Contact with water/moisture may generate corrosive vapors.
Hazardous combustion/decomposition products: Hydrogen chloride, sulfur oxides, chlorine-containing gases. No data available for complete list.

5.3 Advice for firefighters
Wear self-contained breathing apparatus (SCBA) and full protective gear. Approach from upwind. Cool containers with water spray from a safe distance. Prevent fire-fighting water from entering drains or waterways.

SECTION 6: Accidental release measures

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Evacuate area. Keep upwind. Avoid breathing vapors/mist. Avoid contact with skin and eyes. Wear appropriate PPE including chemical-resistant gloves, protective clothing, eye/face protection, and respiratory protection as required.

6.2 Environmental precautions
Prevent entry into drains, sewers, and waterways. Notify authorities if release enters the environment.

6.3 Methods and material for containment and cleaning up
Contain spill. Do not allow contact with water. Absorb with dry, inert, non-combustible absorbent (e.g., dry sand, vermiculite). Collect into suitable, corrosion-resistant, sealed containers for disposal. Ventilate area. Decontaminate spill area cautiously; avoid generating heat and corrosive vapors.

6.4 Reference to other sections
See Section 8 for exposure controls/personal protection and Section 13 for disposal considerations.

SECTION-7: Handling and storage

SECTION 7: Handling and storage

7.1 Precautions for safe handling
Handle in a chemical fume hood or with local exhaust ventilation. Avoid breathing vapors/mist. Avoid contact with skin, eyes, and clothing. Do not get in eyes, on skin, or on clothing. Do not eat, drink, or smoke when using this product. Wash thoroughly after handling. Use corrosion-resistant equipment.

7.2 Conditions for safe storage, including any incompatibilities
Store tightly closed in a cool, dry, well-ventilated area. Protect from moisture/water. Store in corrosion-resistant container with compatible liner. Keep away from incompatible materials.
Incompatibilities: Water/moisture, alcohols, amines, bases/alkalis, oxidizable organic materials, reducing agents, metals susceptible to corrosion. No data available for complete incompatibility list.

7.3 Specific end use(s)
Fine chemical. No data available for specific identified uses.

SECTION 8: Exposure controls / personal protection

SECTION 8: Exposure controls/personal protection

8.1 Control parameters
Occupational exposure limits: Not available.
Biological limit values: Not available.

8.2 Exposure controls
Engineering controls: Use local exhaust ventilation and/or enclosed handling to maintain airborne concentrations as low as practicable. Provide eyewash station and safety shower.
Personal protective equipment (PPE):
- Eye/face protection: Chemical safety goggles and face shield.

- Skin protection: Chemical-resistant gloves (material selection dependent on use conditions) and chemical-resistant protective clothing/apron.
- Respiratory protection: Use NIOSH/EN-approved respirator appropriate for acid gases/halogen gases where ventilation is inadequate or exposure is possible. Selection must be based on hazard and workplace concentrations.
- Hygiene measures: Remove contaminated clothing and wash before reuse. Wash hands and exposed skin after handling.
Environmental exposure controls: Avoid release to the environment; use secondary containment where appropriate.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Test	Result
Appearance	Yellow Coloured Liquid
IR spectrum	No data available
pH	No data available
Solubility	No data available

Property	Value
a) Physical State	No data available
b) Color	No data available
c) Odor	No data available
d) pH	No data available
e) Vapour Pressure	No data available
f) Viscosity	No data available
g) Initial Boiling Point and boiling range	No data available
h) Melting Point / Freezing Point	No data available
i) Auto Ignition Temperature	No data available
j) Flash Point	No data available
k) Explosion Limit, Lower	No data available
l) Explosion Limit, Upper	No data available
m) Decomposition Temperature	No data available
n) Loss on Drying	No data available

Property	Value
o) Relative Density	No data available
p) Solubility (in DMSO)	No data available
q) Oxidizing Properties	No data available

SECTION 10: Stability and reactivity

SECTION 10: Stability and reactivity

10.1 Reactivity
Reacts with water/moisture; may release corrosive gases.

10.2 Chemical stability
Stable under recommended storage conditions. No data available for shelf-life.

10.3 Possibility of hazardous reactions
Hazardous reactions may occur with incompatible materials, especially water/moisture and bases.

10.4 Conditions to avoid
Moisture, water, heat, and incompatible materials.

10.5 Incompatible materials
Water/moisture, alcohols, amines, bases/alkalis, reducing agents, oxidizable organic materials, and certain metals. No data available for complete list.

10.6 Hazardous decomposition products
Hydrogen chloride, sulfur oxides, chlorine-containing gases. No data available for complete list.

SECTION 11: Toxicological information

11.1 Information on toxicological effects
- Acute toxicity: The acute toxicity of sulfuryl chloride following inhalation is high. In male Sprague-Dawley rats with head-only exposure to vapor a 4 h-LC50 of 878 mg/m3 was calculated. Clinical signs included nasal discharge and eye irritation. In humans, pulmonary edema of delayed onset has been reported after inhalation of sulfuryl chloride vapor. Sulfuryl chloride hydrolyzes slowly in moist air and reacts violently with water, forming chlorosulfonic acid, hydrochloric acid and sulfuric acid. Due to this hydrolytic reaction, sulfuryl chloride is corrosive to the skin, eyes and respiratory tract. Studies with sulfuryl chloride concerning sensitizing properties are not available. The hydrolysis products sulfuric acid and hydrochloric acid gave no indication for a sensitizing potential in humans and experimental animals. From a 14-day inhalation study with sulfuryl chloride in rats, a NOAEC could not be derived, since pneumonitis was still observed at the lowest exposure level of 17 mg/m3. The reported effects are in line with all other evidence regarding the chemical and biological properties, i.e. corrosivity of sulfuryl chloride and its hydrolysis products hydrochloric acid, sulfuric acid, and chlorosulfonic acid. Studies performed with sulfuric acid gave LOAECs in the range of 0.3 mg/m3, the LOAEC found in a 90-day study with hydrochloric acid was 15 mg/m3. All findings were confined to the site of first contact and can be explained by the irritating/corrosive properties of the acid. Sulfuryl chloride as well as the hydrolysis products hydrochloric acid, sulfuric acid and chlorosulfonic acid are all classified as corrosive and hydrochloric acid and chlorosulfonic acid are classified as irritant to the respiratory tract. No primary systemic effects were reported. Sulfuryl chloride did not show mutagenic activity in Ames tests with Salmonella typhimurium. A slight mutagenic activity was observed in only one tester strain without metabolic

activation. However, this result was found to be not reproducible in further tests. As sulfuryl chloride decomposes to acids, the resulting change in pH may induce genotoxic effects such as chromosomal aberrations and other DNA damage in vitro and in vivo at the portal-ofentry. No carcinogenicity studies with sulfuryl chloride were identified. The hydrolysis products hydrochloric acid and sulfuric acid gave no clear indications for an increased tumor incidence after life-time exposure in laboratory animals. Studies with sulfuryl chloride concerning effects on fertility and development were not available and there were also no data on fertility effects for the hydrolysis products sulfuric acid and hydrochloric acid. Concerning developmental toxicity, the hydrolysis product sulfuric acid gave no indication for adverse effects in mice and rabbits after exposure via inhalation. Because sulfuryl chloride is a toxicant acting at the portal-of-entry, and because it is unlikely to reach the reproductive organs or the embryo/fetus, toxicity to reproduction or developmental toxicity in mammals are not likely to occur following exposure to sulfuryl chloride by any route. In humans, several epidemiological studies have suggested a relationship between exposure to strong inorganic acid mists containing sulfuric acid and an increased incidence of laryngeal cancer. IARC (1992) has concluded that occupational exposure to strong-inorganic-acid mists containing sulfuric acid is carcinogenic to humans" (Group 1). Concerns have been raised that confounding factors could not be fully excluded. The effects might be a secondary finding to be expected after prolonged exposure to strong acid due to the cytotoxicity and consequent stimulus to increased cell proliferation. LC50 (rat) = 159 ppm/4hr

- Skin corrosion/irritation: The acute toxicity of sulfuryl chloride following inhalation is high. In male Sprague-Dawley rats with head-only exposure to vapor a 4 h-LC50 of 878 mg/m3 was calculated. Clinical signs included nasal discharge and eye irritation. In humans, pulmonary edema of delayed onset has been reported after inhalation of sulfuryl chloride vapor. Sulfuryl chloride hydrolyzes slowly in moist air and reacts violently with water, forming chlorosulfonic acid, hydrochloric acid and sulfuric acid. Due to this hydrolytic reaction, sulfuryl chloride is corrosive to the skin, eyes and respiratory tract. Studies with sulfuryl chloride concerning sensitizing properties are not available. The hydrolysis products sulfuric acid and hydrochloric acid gave no indication for a sensitizing potential in humans and experimental animals. From a 14-day inhalation study with sulfuryl chloride in rats, a NOAEC could not be derived, since pneumonitis was still observed at the lowest exposure level of 17 mg/m3. The reported effects are in line with all other evidence regarding the chemical and biological properties, i.e. corrosivity of sulfuryl chloride and its hydrolysis products hydrochloric acid, sulfuric acid, and chlorosulfonic acid. Studies performed with sulfuric acid gave LOAECs in the range of 0.3 mg/m3, the LOAEC found in a 90-day study with hydrochloric acid was 15 mg/m3. All findings were confined to the site of first contact and can be explained by the irritating/corrosive properties of the acid. Sulfuryl chloride as well as the hydrolysis products hydrochloric acid, sulfuric acid and chlorosulfonic acid are all classified as corrosive and hydrochloric acid and chlorosulfonic acid are classified as irritant to the respiratory tract. No primary systemic effects were reported. Sulfuryl chloride did not show mutagenic activity in Ames tests with Salmonella typhimurium. A slight mutagenic activity was observed in only one tester strain without metabolic activation. However, this result was found to be not reproducible in further tests. As sulfuryl chloride decomposes to acids, the resulting change in pH may induce genotoxic effects such as chromosomal aberrations and other DNA damage in vitro and in vivo at the portal-ofentry. No carcinogenicity studies with sulfuryl chloride were identified. The hydrolysis products hydrochloric acid and sulfuric acid gave no clear indications for an increased tumor incidence after life-time exposure in laboratory animals. Studies with sulfuryl chloride concerning effects on fertility and development were not available and there were also no data on fertility effects for the hydrolysis products sulfuric acid and hydrochloric acid. Concerning developmental toxicity, the hydrolysis product sulfuric acid gave no indication for adverse effects in mice and rabbits after exposure via inhalation. Because sulfuryl chloride is a toxicant acting at the portal-of-entry, and because it is unlikely to reach the reproductive organs or the embryo/fetus, toxicity to reproduction or developmental toxicity in mammals are not likely to occur following exposure to sulfuryl chloride by any route. In humans, several epidemiological studies have suggested a relationship between exposure to strong inorganic acid mists containing sulfuric acid and an increased incidence of laryngeal cancer. IARC (1992) has concluded that occupational exposure to strong-inorganic-acid mists containing sulfuric acid is carcinogenic to

humans" (Group 1). Concerns have been raised that confounding factors could not be fully excluded. The effects might be a secondary finding to be expected after prolonged exposure to strong acid due to the cytotoxicity and consequent stimulus to increased cell proliferation. /SIGNS AND SYMPTOMS/ /It is/ ... corrosive liquid which in contact with the body can cause burns; vapor is a respiratory irritant.
- Serious eye damage/eye irritation: The acute toxicity of sulfuryl chloride following inhalation is high. In male Sprague-Dawley rats with head-only exposure to vapor a 4 h-LC50 of 878 mg/m3 was calculated. Clinical signs included nasal discharge and eye irritation. In humans, pulmonary edema of delayed onset has been reported after inhalation of sulfuryl chloride vapor. Sulfuryl chloride hydrolyzes slowly in moist air and reacts violently with water, forming chlorosulfonic acid, hydrochloric acid and sulfuric acid. Due to this hydrolytic reaction, sulfuryl chloride is corrosive to the skin, eyes and respiratory tract. Studies with sulfuryl chloride concerning sensitizing properties are not available. The hydrolysis products sulfuric acid and hydrochloric acid gave no indication for a sensitizing potential in humans and experimental animals. From a 14-day inhalation study with sulfuryl chloride in rats, a NOAEC could not be derived, since pneumonitis was still observed at the lowest exposure level of 17 mg/m3. The reported effects are in line with all other evidence regarding the chemical and biological properties, i.e. corrosivity of sulfuryl chloride and its hydrolysis products hydrochloric acid, sulfuric acid, and chlorosulfonic acid. Studies performed with sulfuric acid gave LOAECs in the range of 0.3 mg/m3, the LOAEC found in a 90-day study with hydrochloric acid was 15 mg/m3. All findings were confined to the site of first contact and can be explained by the irritating/corrosive properties of the acid. Sulfuryl chloride as well as the hydrolysis products hydrochloric acid, sulfuric acid and chlorosulfonic acid are all classified as corrosive and hydrochloric acid and chlorosulfonic acid are classified as irritant to the respiratory tract. No primary systemic effects were reported. Sulfuryl chloride did not show mutagenic activity in Ames tests with Salmonella typhimurium. A slight mutagenic activity was observed in only one tester strain without metabolic activation. However, this result was found to be not reproducible in further tests. As sulfuryl chloride decomposes to acids, the resulting change in pH may induce genotoxic effects such as chromosomal aberrations and other DNA damage in vitro and in vivo at the portal-ofentry. No carcinogenicity studies with sulfuryl chloride were identified. The hydrolysis products hydrochloric acid and sulfuric acid gave no clear indications for an increased tumor incidence after life-time exposure in laboratory animals. Studies with sulfuryl chloride concerning effects on fertility and development were not available and there were also no data on fertility effects for the hydrolysis products sulfuric acid and hydrochloric acid. Concerning developmental toxicity, the hydrolysis product sulfuric acid gave no indication for adverse effects in mice and rabbits after exposure via inhalation. Because sulfuryl chloride is a toxicant acting at the portal-of-entry, and because it is unlikely to reach the reproductive organs or the embryo/fetus, toxicity to reproduction or developmental toxicity in mammals are not likely to occur following exposure to sulfuryl chloride by any route. In humans, several epidemiological studies have suggested a relationship between exposure to strong inorganic acid mists containing sulfuric acid and an increased incidence of laryngeal cancer. IARC (1992) has concluded that occupational exposure to strong-inorganic-acid mists containing sulfuric acid is carcinogenic to humans" (Group 1). Concerns have been raised that confounding factors could not be fully excluded. The effects might be a secondary finding to be expected after prolonged exposure to strong acid due to the cytotoxicity and consequent stimulus to increased cell proliferation. /LABORATORY ANIMALS: Acute Exposure/ The LC50 of sulfuryl chloride (approx 100% pure) in male Sprague-Dawley rats (10 animals/group) exposed to a single 4-hr inhalation (nose only) was found to be 159 ppm (equivalent to 878 mg/cu m). All exposed animals displayed red nasal and ocular discharge. The survivors showed body weight loss for 1 to 2 days after the exposure. No macroscopic findings were reported.
- Respiratory or skin sensitization: No data available.
- Germ cell mutagenicity: The acute toxicity of sulfuryl chloride following inhalation is high. In male Sprague-Dawley rats with head-only exposure to vapor a 4 h-LC50 of 878 mg/m3 was calculated. Clinical signs included nasal discharge and eye irritation. In humans, pulmonary edema of delayed onset has been reported after inhalation of sulfuryl chloride vapor. Sulfuryl chloride hydrolyzes slowly in moist air and reacts violently with water, forming

chlorosulfonic acid, hydrochloric acid and sulfuric acid. Due to this hydrolytic reaction, sulfuryl chloride is corrosive to the skin, eyes and respiratory tract. Studies with sulfuryl chloride concerning sensitizing properties are not available. The hydrolysis products sulfuric acid and hydrochloric acid gave no indication for a sensitizing potential in humans and experimental animals. From a 14-day inhalation study with sulfuryl chloride in rats, a NOAEC could not be derived, since pneumonitis was still observed at the lowest exposure level of 17 mg/m3. The reported effects are in line with all other evidence regarding the chemical and biological properties, i.e. corrosivity of sulfuryl chloride and its hydrolysis products hydrochloric acid, sulfuric acid, and chlorosulfonic acid. Studies performed with sulfuric acid gave LOAECs in the range of 0.3 mg/m3, the LOAEC found in a 90-day study with hydrochloric acid was 15 mg/m3. All findings were confined to the site of first contact and can be explained by the irritating/corrosive properties of the acid. Sulfuryl chloride as well as the hydrolysis products hydrochloric acid, sulfuric acid and chlorosulfonic acid are all classified as corrosive and hydrochloric acid and chlorosulfonic acid are classified as irritant to the respiratory tract. No primary systemic effects were reported. Sulfuryl chloride did not show mutagenic activity in Ames tests with Salmonella typhimurium. A slight mutagenic activity was observed in only one tester strain without metabolic activation. However, this result was found to be not reproducible in further tests. As sulfuryl chloride decomposes to acids, the resulting change in pH may induce genotoxic effects such as chromosomal aberrations and other DNA damage in vitro and in vivo at the portal-ofentry. No carcinogenicity studies with sulfuryl chloride were identified. The hydrolysis products hydrochloric acid and sulfuric acid gave no clear indications for an increased tumor incidence after life-time exposure in laboratory animals. Studies with sulfuryl chloride concerning effects on fertility and development were not available and there were also no data on fertility effects for the hydrolysis products sulfuric acid and hydrochloric acid. Concerning developmental toxicity, the hydrolysis product sulfuric acid gave no indication for adverse effects in mice and rabbits after exposure via inhalation. Because sulfuryl chloride is a toxicant acting at the portal-of-entry, and because it is unlikely to reach the reproductive organs or the embryo/fetus, toxicity to reproduction or developmental toxicity in mammals are not likely to occur following exposure to sulfuryl chloride by any route. In humans, several epidemiological studies have suggested a relationship between exposure to strong inorganic acid mists containing sulfuric acid and an increased incidence of laryngeal cancer. IARC (1992) has concluded that occupational exposure to strong-inorganic-acid mists containing sulfuric acid is carcinogenic to humans" (Group 1). Concerns have been raised that confounding factors could not be fully excluded. The effects might be a secondary finding to be expected after prolonged exposure to strong acid due to the cytotoxicity and consequent stimulus to increased cell proliferation.

- Carcinogenicity: The acute toxicity of sulfuryl chloride following inhalation is high. In male Sprague-Dawley rats with head-only exposure to vapor a 4 h-LC50 of 878 mg/m3 was calculated. Clinical signs included nasal discharge and eye irritation. In humans, pulmonary edema of delayed onset has been reported after inhalation of sulfuryl chloride vapor. Sulfuryl chloride hydrolyzes slowly in moist air and reacts violently with water, forming chlorosulfonic acid, hydrochloric acid and sulfuric acid. Due to this hydrolytic reaction, sulfuryl chloride is corrosive to the skin, eyes and respiratory tract. Studies with sulfuryl chloride concerning sensitizing properties are not available. The hydrolysis products sulfuric acid and hydrochloric acid gave no indication for a sensitizing potential in humans and experimental animals. From a 14-day inhalation study with sulfuryl chloride in rats, a NOAEC could not be derived, since pneumonitis was still observed at the lowest exposure level of 17 mg/m3. The reported effects are in line with all other evidence regarding the chemical and biological properties, i.e. corrosivity of sulfuryl chloride and its hydrolysis products hydrochloric acid, sulfuric acid, and chlorosulfonic acid. Studies performed with sulfuric acid gave LOAECs in the range of 0.3 mg/m3, the LOAEC found in a 90-day study with hydrochloric acid was 15 mg/m3. All findings were confined to the site of first contact and can be explained by the irritating/corrosive properties of the acid. Sulfuryl chloride as well as the hydrolysis products hydrochloric acid, sulfuric acid and chlorosulfonic acid are all classified as corrosive and hydrochloric acid and chlorosulfonic acid are classified as irritant to the respiratory tract. No primary systemic effects were reported. Sulfuryl chloride did not show mutagenic activity in Ames tests with Salmonella typhimurium. A slight mutagenic activity was observed in only one tester strain without metabolic

activation. However, this result was found to be not reproducible in further tests. As sulfuryl chloride decomposes to acids, the resulting change in pH may induce genotoxic effects such as chromosomal aberrations and other DNA damage in vitro and in vivo at the portal-ofentry. No carcinogenicity studies with sulfuryl chloride were identified. The hydrolysis products hydrochloric acid and sulfuric acid gave no clear indications for an increased tumor incidence after life-time exposure in laboratory animals. Studies with sulfuryl chloride concerning effects on fertility and development were not available and there were also no data on fertility effects for the hydrolysis products sulfuric acid and hydrochloric acid. Concerning developmental toxicity, the hydrolysis product sulfuric acid gave no indication for adverse effects in mice and rabbits after exposure via inhalation. Because sulfuryl chloride is a toxicant acting at the portal-of-entry, and because it is unlikely to reach the reproductive organs or the embryo/fetus, toxicity to reproduction or developmental toxicity in mammals are not likely to occur following exposure to sulfuryl chloride by any route. In humans, several epidemiological studies have suggested a relationship between exposure to strong inorganic acid mists containing sulfuric acid and an increased incidence of laryngeal cancer. IARC (1992) has concluded that occupational exposure to strong-inorganic-acid mists containing sulfuric acid is carcinogenic to humans" (Group 1). Concerns have been raised that confounding factors could not be fully excluded. The effects might be a secondary finding to be expected after prolonged exposure to strong acid due to the cytotoxicity and consequent stimulus to increased cell proliferation.
- Reproductive toxicity: The acute toxicity of sulfuryl chloride following inhalation is high. In male Sprague-Dawley rats with head-only exposure to vapor a 4 h-LC50 of 878 mg/m3 was calculated. Clinical signs included nasal discharge and eye irritation. In humans, pulmonary edema of delayed onset has been reported after inhalation of sulfuryl chloride vapor. Sulfuryl chloride hydrolyzes slowly in moist air and reacts violently with water, forming chlorosulfonic acid, hydrochloric acid and sulfuric acid. Due to this hydrolytic reaction, sulfuryl chloride is corrosive to the skin, eyes and respiratory tract. Studies with sulfuryl chloride concerning sensitizing properties are not available. The hydrolysis products sulfuric acid and hydrochloric acid gave no indication for a sensitizing potential in humans and experimental animals. From a 14-day inhalation study with sulfuryl chloride in rats, a NOAEC could not be derived, since pneumonitis was still observed at the lowest exposure level of 17 mg/m3. The reported effects are in line with all other evidence regarding the chemical and biological properties, i.e. corrosivity of sulfuryl chloride and its hydrolysis products hydrochloric acid, sulfuric acid, and chlorosulfonic acid. Studies performed with sulfuric acid gave LOAECs in the range of 0.3 mg/m3, the LOAEC found in a 90-day study with hydrochloric acid was 15 mg/m3. All findings were confined to the site of first contact and can be explained by the irritating/corrosive properties of the acid. Sulfuryl chloride as well as the hydrolysis products hydrochloric acid, sulfuric acid and chlorosulfonic acid are all classified as corrosive and hydrochloric acid and chlorosulfonic acid are classified as irritant to the respiratory tract. No primary systemic effects were reported. Sulfuryl chloride did not show mutagenic activity in Ames tests with Salmonella typhimurium. A slight mutagenic activity was observed in only one tester strain without metabolic activation. However, this result was found to be not reproducible in further tests. As sulfuryl chloride decomposes to acids, the resulting change in pH may induce genotoxic effects such as chromosomal aberrations and other DNA damage in vitro and in vivo at the portal-ofentry. No carcinogenicity studies with sulfuryl chloride were identified. The hydrolysis products hydrochloric acid and sulfuric acid gave no clear indications for an increased tumor incidence after life-time exposure in laboratory animals. Studies with sulfuryl chloride concerning effects on fertility and development were not available and there were also no data on fertility effects for the hydrolysis products sulfuric acid and hydrochloric acid. Concerning developmental toxicity, the hydrolysis product sulfuric acid gave no indication for adverse effects in mice and rabbits after exposure via inhalation. Because sulfuryl chloride is a toxicant acting at the portal-of-entry, and because it is unlikely to reach the reproductive organs or the embryo/fetus, toxicity to reproduction or developmental toxicity in mammals are not likely to occur following exposure to sulfuryl chloride by any route. In humans, several epidemiological studies have suggested a relationship between exposure to strong inorganic acid mists containing sulfuric acid and an increased incidence of laryngeal cancer. IARC (1992) has concluded that occupational exposure to strong-inorganic-acid mists containing sulfuric acid is carcinogenic to

humans" (Group 1). Concerns have been raised that confounding factors could not be fully excluded. The effects might be a secondary finding to be expected after prolonged exposure to strong acid due to the cytotoxicity and consequent stimulus to increased cell proliferation.
- STOT-single exposure: No data available.
- STOT-repeated exposure: /LABORATORY ANIMALS: Subchronic or Prechronic Exposure/ Sprague-Dawley rats were given 3, 10, or 30 ppm (about 16.4, 55, or 165 mg/cu m respectively) /sulfuryl chloride/ by inhalation for 6 hours/day, 5 days/week, for 2 weeks. High concentration was reduced to 20 ppm (about 110 mg/cu m) after 2 exposures due to excessive weight loss and terminated after 8 exposures due to the death of 2 rats; immediately after exposure increase of RBC, hemoglobin level, lung to body weight ratio and fibrino-necrotic bronchopneumonia in the 10 and 20 (30) ppm groups; marked recovery from the lesions, normal weight gain 2 weeks after termination of exposure. In the 3 ppm group exacerbation of naturally occurring murine pneumonitis. /LABORATORY ANIMALS: Subchronic or Prechronic Exposure/ /In a 14 day inhalation study/ with 10 male Sprague-Dawley rats per test group, rats were exposed 6 hours per day and 5 days per week to sulfuryl chloride (as vapor), /purity 100%, specially distilled batch/, at concentrations of 17, 55 or 166 mg/cu m. The highest concentration was reduced to 110 mg/cu m after 2 exposures due to excessive weight loss and was terminated after 8 exposures due to the death of 2 rats. Animals exhibited labored breathing, red discharge from nose, swollen nose and reduced body temperature. Body weight was reduced also at low and mid dose levels, but developed normally during recovery Immediately after exposure a concentration-dependent increase of red blood cells and hemoglobin levels, as well as of relative lung weights was observed in rats treated with 55 mg/cu m or more. Clinical chemistry showed increased blood urea nitrogen in all treated groups and increased levels of serum cholesterol in mid and high dose groups. Histopathologically these rats showed a fibrino-necrotic bronchopneumonia. Additionally, the rats of the high-dose group revealed a fibrino-purulent rhinitis and lymphoid atrophy in thymus. Marked recovery from these symptoms and return to normal weight gain was observed after the 2-week post exposure observation period. There was a decrease of monocytes in all treated groups at the end of the recovery period. In the low-dose group the only effect was an apparent exacerbation of naturally occurring murine pneumonitis.
- Aspiration hazard: No data available.

Likely routes of exposure
- The acute toxicity of sulfuryl chloride following inhalation is high. In male Sprague-Dawley rats with head-only exposure to vapor a 4 h-LC50 of 878 mg/m3 was calculated. Clinical signs included nasal discharge and eye irritation. In humans, pulmonary edema of delayed onset has been reported after inhalation of sulfuryl chloride vapor. Sulfuryl chloride hydrolyzes slowly in moist air and reacts violently with water, forming chlorosulfonic acid, hydrochloric acid and sulfuric acid. Due to this hydrolytic reaction, sulfuryl chloride is corrosive to the skin, eyes and respiratory tract. Studies with sulfuryl chloride concerning sensitizing properties are not available. The hydrolysis products sulfuric acid and hydrochloric acid gave no indication for a sensitizing potential in humans and experimental animals. From a 14-day inhalation study with sulfuryl chloride in rats, a NOAEC could not be derived, since pneumonitis was still observed at the lowest exposure level of 17 mg/m3. The reported effects are in line with all other evidence regarding the chemical and biological properties, i.e. corrosivity of sulfuryl chloride and its hydrolysis products hydrochloric acid, sulfuric acid, and chlorosulfonic acid. Studies performed with sulfuric acid gave LOAECs in the range of 0.3 mg/m3, the LOAEC found in a 90-day study with hydrochloric acid was 15 mg/m3. All findings were confined to the site of first contact and can be explained by the irritating/corrosive properties of the acid. Sulfuryl chloride as well as the hydrolysis products hydrochloric acid, sulfuric acid and chlorosulfonic acid are all classified as corrosive and hydrochloric acid and chlorosulfonic acid are classified as irritant to the respiratory tract. No primary systemic effects were reported. Sulfuryl chloride did not show mutagenic activity in Ames tests with Salmonella typhimurium. A slight mutagenic activity was observed in only one tester strain without metabolic activation. However, this result was found to be not reproducible in further tests. As sulfuryl chloride decomposes to acids, the resulting change in pH may induce genotoxic effects such as chromosomal aberrations and other DNA

damage in vitro and in vivo at the portal-ofentry. No carcinogenicity studies with sulfuryl chloride were identified. The hydrolysis products hydrochloric acid and sulfuric acid gave no clear indications for an increased tumor incidence after life-time exposure in laboratory animals. Studies with sulfuryl chloride concerning effects on fertility and development were not available and there were also no data on fertility effects for the hydrolysis products sulfuric acid and hydrochloric acid. Concerning developmental toxicity, the hydrolysis product sulfuric acid gave no indication for adverse effects in mice and rabbits after exposure via inhalation. Because sulfuryl chloride is a toxicant acting at the portal-of-entry, and because it is unlikely to reach the reproductive organs or the embryo/fetus, toxicity to reproduction or developmental toxicity in mammals are not likely to occur following exposure to sulfuryl chloride by any route. In humans, several epidemiological studies have suggested a relationship between exposure to strong inorganic acid mists containing sulfuric acid and an increased incidence of laryngeal cancer. IARC (1992) has concluded that occupational exposure to strong-inorganic-acid mists containing sulfuric acid is carcinogenic to humans" (Group 1). Concerns have been raised that confounding factors could not be fully excluded. The effects might be a secondary finding to be expected after prolonged exposure to strong acid due to the cytotoxicity and consequent stimulus to increased cell proliferation.

Symptoms related to the physical, chemical and toxicological characteristics
- The acute toxicity of sulfuryl chloride following inhalation is high. In male Sprague-Dawley rats with head-only exposure to vapor a 4 h-LC50 of 878 mg/m3 was calculated. Clinical signs included nasal discharge and eye irritation. In humans, pulmonary edema of delayed onset has been reported after inhalation of sulfuryl chloride vapor. Sulfuryl chloride hydrolyzes slowly in moist air and reacts violently with water, forming chlorosulfonic acid, hydrochloric acid and sulfuric acid. Due to this hydrolytic reaction, sulfuryl chloride is corrosive to the skin, eyes and respiratory tract. Studies with sulfuryl chloride concerning sensitizing properties are not available. The hydrolysis products sulfuric acid and hydrochloric acid gave no indication for a sensitizing potential in humans and experimental animals. From a 14-day inhalation study with sulfuryl chloride in rats, a NOAEC could not be derived, since pneumonitis was still observed at the lowest exposure level of 17 mg/m3. The reported effects are in line with all other evidence regarding the chemical and biological properties, i.e. corrosivity of sulfuryl chloride and its hydrolysis products hydrochloric acid, sulfuric acid, and chlorosulfonic acid. Studies performed with sulfuric acid gave LOAECs in the range of 0.3 mg/m3, the LOAEC found in a 90-day study with hydrochloric acid was 15 mg/m3. All findings were confined to the site of first contact and can be explained by the irritating/corrosive properties of the acid. Sulfuryl chloride as well as the hydrolysis products hydrochloric acid, sulfuric acid and chlorosulfonic acid are all classified as corrosive and hydrochloric acid and chlorosulfonic acid are classified as irritant to the respiratory tract. No primary systemic effects were reported. Sulfuryl chloride did not show mutagenic activity in Ames tests with Salmonella typhimurium. A slight mutagenic activity was observed in only one tester strain without metabolic activation. However, this result was found to be not reproducible in further tests. As sulfuryl chloride decomposes to acids, the resulting change in pH may induce genotoxic effects such as chromosomal aberrations and other DNA damage in vitro and in vivo at the portal-ofentry. No carcinogenicity studies with sulfuryl chloride were identified. The hydrolysis products hydrochloric acid and sulfuric acid gave no clear indications for an increased tumor incidence after life-time exposure in laboratory animals. Studies with sulfuryl chloride concerning effects on fertility and development were not available and there were also no data on fertility effects for the hydrolysis products sulfuric acid and hydrochloric acid. Concerning developmental toxicity, the hydrolysis product sulfuric acid gave no indication for adverse effects in mice and rabbits after exposure via inhalation. Because sulfuryl chloride is a toxicant acting at the portal-of-entry, and because it is unlikely to reach the reproductive organs or the embryo/fetus, toxicity to reproduction or developmental toxicity in mammals are not likely to occur following exposure to sulfuryl chloride by any route. In humans, several epidemiological studies have suggested a relationship between exposure to strong inorganic acid mists containing sulfuric acid and an increased incidence of laryngeal cancer. IARC (1992) has concluded that occupational exposure to strong-inorganic-acid mists containing sulfuric acid is carcinogenic to humans" (Group 1). Concerns have been raised that confounding factors could not be fully excluded. The effects

might be a secondary finding to be expected after prolonged exposure to strong acid due to the cytotoxicity and consequent stimulus to increased cell proliferation.

SECTION 12: Ecological information

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12.1 Toxicity
No data available.

12.2 Persistence and degradability
No data available.

12.3 Bioaccumulative potential
No data available.

12.4 Mobility in soil
No data available.

12.5 Results of PBT and vPvB assessment
No data available.

12.6 Endocrine disrupting properties
No data available.

12.7 Other adverse effects
No data available.

SECTION 13: Disposal considerations

SECTION 13: Disposal considerations

13.1 Waste treatment methods
Dispose of contents/container in accordance with local/regional/national/international regulations. Do not discharge to drains.
Waste should be handled as hazardous waste. Incineration or treatment by a licensed hazardous waste contractor is recommended where permitted.
Contaminated packaging: Empty containers may retain residues and are hazardous. Do not reuse containers.
Dispose of as hazardous waste.

SECTION 14: Transport information

SECTION 14: Transport information

14.1 UN number
Not available.

14.2 UN proper shipping name
Not available.

14.3 Transport hazard class(es)
Not available.

14.4 Packing group
Not available.

14.5 Environmental hazards
Not available.

14.6 Special precautions for user
Transport in tightly closed, corrosion-resistant containers. Protect from moisture. Keep away from incompatible materials.

14.7 Maritime transport in bulk according to IMO instruments
Not available.

SECTION 15: Regulatory information

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15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
No data available. Regulations may vary by region; ensure compliance with applicable local and national requirements.

15.2 Chemical safety assessment
No data available.

SECTION 16: Other information

SECTION 16: Other information

Product name: Sulfuryl Chloride
CAS No.: 7791-25-5
Catalog No.: CS-T-87359
Supplier: Clearsynth Labs Ltd., Mumbai, India
Emergency phone: +91-22-245045900

Revision date: Not available

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