

Material Safety Data Sheet

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Version 1.2

According to 91/155/EEC

1 - Product and Company Information

Product Name O-CHLOROBENZYLIDENEMALONONITRILE, 96%
Product Number 130931

Company Sigma-Aldrich Pte Ltd
#08-01 Citilink Warehouse
Singapore 118529

Technical Phone # 65 271 1089
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2 - Composition/Information on Ingredients

Product Name	CAS #	EC no
O-CHLOROBENZYLIDENEMALONONITRILE	2698-41-1	220-278-9

Formula C10H5ClN2
Molecular Weight 188.62 AMU
Synonyms (o-Chlorobenzal)malononitrile *
2-Chlorobenzalmalononitrile *
o-Chlorobenzylidene malonitrile *
2-Chlorobenzylidene malononitrile *
o-Chlorobenzylidene malononitrile (ACGIH:OSHA) *
2-Chlorobmn * CS *
beta,beta-Dicyano-o-chlorostyrene * NCI-C55118 *
Propanedinitrile, ((2-chlorophenyl)methylene) *
USAF KF-11 * TL 238

3 - Hazards Identification

SPECIAL INDICATION OF HAZARDS TO HUMANS AND THE ENVIRONMENT

Toxic if swallowed. May cause sensitization by inhalation and skin contact.

4 - First Aid Measures

AFTER INHALATION

If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

AFTER SKIN CONTACT

In case of skin contact, flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician.

AFTER EYE CONTACT

In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

AFTER INGESTION

If swallowed, wash out mouth with water provided person is

conscious. Call a physician immediately.

5 - Fire Fighting Measures

EXTINGUISHING MEDIA

Suitable: Carbon dioxide, dry chemical powder, or appropriate foam.

SPECIAL RISKS

Specific Hazard(s): Emits toxic fumes under fire conditions.

SPECIAL PROTECTIVE EQUIPMENT FOR FIREFIGHTERS

Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

6 - Accidental Release Measures

PERSONAL PRECAUTION PROCEDURES TO BE FOLLOWED IN CASE OF LEAK OR SPILL

Evacuate area.

PROCEDURE(S) OF PERSONAL PRECAUTION(S)

Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

METHODS FOR CLEANING UP

Cover with dry lime or soda ash, pick up, keep in a closed container, and hold for waste disposal. Ventilate area and wash spill site after material pickup is complete.

7 - Handling and Storage

HANDLING

Directions for Safe Handling: Do not breathe dust. Do not get in eyes, on skin, on clothing. Avoid prolonged or repeated exposure.

STORAGE

Conditions of Storage: Keep tightly closed. Store in a cool dry place.

8 - Exposure Controls / Personal Protection

ENGINEERING CONTROLS

Use only in a chemical fume hood. Safety shower and eye bath.

GENERAL HYGIENE MEASURES

Discard contaminated clothing and shoes. Wash thoroughly after handling.

EXPOSURE LIMITS - DENMARK

Source	Type	Value
OEL	TWA	0.4 mg/m ³
		0.05 ppm

Remarks: LH

EXPOSURE LIMITS - GERMANY

Source	Type	Value
TRGS 900	OEL	0.4 mg/m ³

Remarks: H,NL

EXPOSURE LIMITS - NORWAY

Source	Type	Value
	OEL	0.4 mg/m ³

0.05 ppm

Remarks: H

EXPOSURE LIMITS - SWITZERLAND

Source	Type	Value
OEL	OEL	0.4 mg/m3
		0.05 ppm

Remarks: H

PERSONAL PROTECTIVE EQUIPMENT

Respiratory Protection: Government approved respirator.
Hand Protection: Compatible chemical-resistant gloves.
Eye Protection: Chemical safety goggles.
Special Protective Measures: Faceshield (8-inch minimum).

9 - Physical and Chemical Properties

Appearance	Physical State: Solid	
Property	Value	At Temperature or Pressure
pH	N/A	
BP/BP Range	N/A	
MP/MP Range	94 - 96 °C	
Flash Point	N/A	
Flammability	N/A	
Autoignition Temp	N/A	
Oxidizing Properties	N/A	
Explosive Properties	N/A	
Explosion Limits	N/A	
Vapor Pressure	N/A	
Partition Coefficient	N/A	
Viscosity	N/A	
Vapor Density	N/A	
Saturated Vapor Conc.	N/A	
Evaporation Rate	N/A	
Bulk Density	N/A	
Decomposition Temp.	N/A	
Solvent Content	N/A	
Water Content	N/A	
Surface Tension	N/A	
Conductivity	N/A	
Miscellaneous Data	N/A	
Solubility	N/A	

10 - Stability and Reactivity

STABILITY

Stable: Stable.
Materials to Avoid: Strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide, Nitrogen oxides, Hydrogen chloride gas, Hydrogen cyanide.

HAZARDOUS POLYMERIZATION

Hazardous Polymerization: Will not occur

11 - Toxicological Information

RTECS NUMBER: 003675000

ACUTE TOXICITY

LD50
Oral
Rat
178 mg/kg
Remarks: Gastrointestinal:Gastritis.

LD50
Intraperitoneal
Rat
48 MG/KG

LD50
Intravenous
Rat
28 MG/KG
Remarks: Behavioral:Convulsions or effect on seizure threshold.
Lungs, Thorax, or Respiration:Respiratory stimulation. Kidney,
Ureter, Bladder:Other changes.

LD50
Oral
Mouse
282 mg/kg

LD50
Intraperitoneal
Mouse
32320 UG/KG
Remarks: Skin and Appendages: Decrease in humoral immune
response.

LD50
Intravenous
Mouse
47700 UG/KG
Remarks: Behavioral:Convulsions or effect on seizure threshold.
Lungs, Thorax, or Respiration:Other changes.

LD50
Oral
Rabbit
143 mg/kg
Remarks: Behavioral:Coma. Lungs, Thorax, or Respiration:Other
changes. Skin and Appendages: Other: Hair.

LD50
Intraperitoneal
Rabbit
32065 UG/KG
Remarks: Blood:Other changes.

LD50
Intravenous
Rabbit
8 MG/KG
Remarks: Sense Organs and Special Senses (Nose, Eye, Ear, and
Taste):Eye:Lacrimation. Behavioral:Somnolence (general depressed
activity). Gastrointestinal:Hypermotility, diarrhea.

LD50

Oral
Guinea pig
212 mg/kg
Remarks: Behavioral:Coma. Lungs, Thorax, or Respiration:Other
changes. Skin and Appendages: Other: Hair.

LD50
Intraperitoneal
Guinea pig
73 MG/KG
Remarks: Behavioral:Coma. Lungs, Thorax, or Respiration:Other
changes. Skin and Appendages: Other: Hair.

IRRITATION DATA

Skin
Human
10 mg
1H
Remarks: Mild irritation effect

Eyes
Man
5 mg/m³
20S
Remarks: Severe irritation effect

Eyes
Man
0.000624 mg

Skin
Rat
12 %
6H
Remarks: Open irritation test

Skin
Rabbit
12 %
6H
Remarks: Open irritation test

Eyes
Rabbit
5 mg

Eyes
Rabbit
1 mg
Remarks: Mild irritation effect

Eyes
Rabbit
0.00115 mg

Skin
Guinea pig
12 %
6H
Remarks: Open irritation test

Eyes
Guinea pig
0.000429 mg

SENSITIZATION

Sensitization: May cause allergic respiratory and skin reactions

SIGNS AND SYMPTOMS OF EXPOSURE

May be partially metabolized to cyanide in the body. Inhalation may result in spasm, inflammation and edema of the larynx and bronchi, chemical pneumonitis, and pulmonary edema. Other symptoms of exposure can include moderate to severe chest tightness, wheezing, coughing, shortness of breath, increased mucous discharge, stuffy nose, burning eyes, sneezing, and lightheadedness. To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

ROUTE OF EXPOSURE

Skin Contact: Causes severe skin irritation.
Skin Absorption: May be harmful if absorbed through the skin.
Eye Contact: Causes severe eye irritation.
Inhalation: May be harmful if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract.
Ingestion: Toxic if swallowed.

TARGET ORGAN INFORMATION

Eyes. Lungs. Liver. Kidneys.

CONDITIONS AGGRAVATED BY EXPOSURE

May provoke asthmatic response in persons with asthma who are sensitive to airway irritants

CHRONIC EXPOSURE - CARCINOGEN

Result: This product is or contains a component that is probably not carcinogenic based on its IARC, ACGIH, NTP, or EPA classification.

CHRONIC EXPOSURE - MUTAGEN

Result: Laboratory experiments have shown mutagenic effects.

Mouse
2500 UG/L
Cell Type: lymphocyte
Mutation in mammalian somatic cells.

Hamster
19 UMOL/L
Cell Type: lung
Micronucleus test

Hamster
6 MG/L
Cell Type: ovary
Cytogenetic analysis

Hamster
9400 NMOL/L
Cell Type: lung
Cytogenetic analysis

Hamster
10 MG/L
Cell Type: ovary
Sister chromatid exchange

Hamster
18800 NMOL/L
Cell Type: lung
Sister chromatid exchange

CHRONIC EXPOSURE - TERATOGEN

Species: Rat
Dose: 6 MG/M3/5M
Route of Application: Inhalation
Exposure Time: (6-15D PREG)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death,
e.g., stunted fetus).

12 - Ecological Information

13 - Disposal Considerations

SUBSTANCE DISPOSAL

Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber. Observe all federal, state, and local environmental regulations.

14 - Transport Information

RID/ADR

UN#: 1693
Class: 6.1
PG: II
Proper Shipping Name: Tear gas substance, solid, n.o.s.

IMDG

UN#: 1693
Class: 6.1
PG: II
EmS Number: 6.1-03
MFAG Number: 740
Proper Shipping Name: TEAR GAS SUBSTANCE, SOLID, N.O.S.
Marine Pollutant: No
Severe Marine Pollutant: No
Technical Name: Required

IATA

UN#: 1693
Class: 6.1
PG: II
Proper Shipping Name: Tear gas substance, solid, n.o.s.
Inhalation Packing Group I: No
Technical Name: Required

15 - Regulatory Information

CLASSIFICATION AND LABELING ACCORDING TO EU DIRECTIVES
INDICATION OF DANGER: T

Toxic.

R-PHRASES: 25 42/43

Toxic if swallowed. May cause sensitization by inhalation and skin contact.

S-PHRASES: 45 26 27 36/37/39

In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Take off immediately all contaminated clothing. Wear suitable protective clothing, gloves, and eye/face protection.

SWITZERLAND

SWISS POISON CLASS: 2

16 - Other Information

WARRANTY

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale. Copyright 2004 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.

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