

## Material Safety Data Sheet

Date Printed: 16/DEC/2004

Date Updated: 22/JUN/2004

Version 1.8

According to 91/155/EEC

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1 - Product and Company Information

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Product Name	1,4-DICHLOROBENZENE, 99+%
Product Number	D56829
Company	Sigma-Aldrich Pte Ltd #08-01 Citilink Warehouse Singapore 118529 Singapore
Technical Phone #	65 271 1089
Fax	65 271 1571

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2 - Composition/Information on Ingredients

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Product Name	CAS #	EC no	Annex I Index Number
1,4-DICHLOROBENZENE	106-46-7	203-400-5	602-035-00-2

Formula	C6H4Cl2
Molecular Weight	147 AMU
Synonyms	p-Chlorophenyl chloride * p-Dichloorbenzeen (Dutch) * 1,4-Dichloorbenzeen (Dutch) * p-Dichlorbenzol (German) * 1,4-Dichlor-benzol (German) * Di-chloricide * p-Dichlorobenzene * 1,4-Dichlorobenzene * p-Dichlorobenzene (ACGIH:OSHA) * p-Dichlorobenzol * p-Diclorobenzene (Italian) * 1,4-Diclorobenzene (Italian) * Evola * Globol * NCI-C54955 * Paracide * Para crystals * Paradi * Paradichlorbenzol (German) * Paradichlorobenzene * Paradichlorobenzol * Paradow * Paramoth * Paranuggets * Parazene * PDB * PDCB * Persia-perazol * RCRA waste number U070 * RCRA waste number U071 * RCRA waste number U072 * Santochlor

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3 - Hazards Identification

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SPECIAL INDICATION OF HAZARDS TO HUMANS AND THE ENVIRONMENT  
Irritating to eyes. Very toxic to aquatic organisms, may cause  
long-term adverse effects in the aquatic environment.

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4 - First Aid Measures

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## 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.

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### 5 - Fire Fighting Measures

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#### EXTINGUISHING MEDIA

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

#### SPECIAL RISKS

Specific Hazard(s): Combustible. 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.

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### 6 - Accidental Release Measures

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

#### PROCEDURE(S) OF PERSONAL PRECAUTION(S)

Wear respirator, chemical safety goggles, rubber boots, and heavy rubber gloves.

#### METHODS FOR CLEANING UP

Sweep up, place in a bag and hold for waste disposal. Avoid raising dust. Ventilate area and wash spill site after material pickup is complete.

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### 7 - Handling and Storage

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#### HANDLING

Directions for Safe Handling: Do not breathe dust. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure.

#### STORAGE

Conditions of Storage: Keep tightly closed. Keep away from heat, sparks, and open flame. Store in a cool dry place.

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### 8 - Exposure Controls / Personal Protection

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#### ENGINEERING CONTROLS

Safety shower and eye bath. Mechanical exhaust required.

#### GENERAL HYGIENE MEASURES

Wash thoroughly after handling.

#### EXPOSURE LIMITS

Country	Source	Type	Value
Poland		NDS	90 MG/M3
Poland		NDSCh	180
Poland		NDSP	-

## EXPOSURE LIMITS - EUROPEAN UNION

Source	Type	Value
OEL	OEL	122 mg/m3 20 ppm

## EXPOSURE LIMITS - DENMARK

Source	Type	Value
OEL	TWA	60 mg/m3 10 ppm

Remarks: K

## EXPOSURE LIMITS - GERMANY

Source	Type	Value
TRGS 900	OEL	300 mg/m3 50 ppm

Remarks: 4

Remarks: Y

## EXPOSURE LIMITS - NORWAY

Source	Type	Value
	OEL	240 mg/m3 40 ppm

## EXPOSURE LIMITS - SWEDEN

Source	Type	Value
	LLV (Level)	60 mg/m3 10 ppm

## EXPOSURE LIMITS - SWITZERLAND

Source	Type	Value
OEL	OEL	300 mg/m3 50 ppm

Remarks: C

## EXPOSURE LIMITS - UNITED KINGDOM

Source	Type	Value
OEL	OEL	153 mg/m3 25 ppm
OEL	STEL	306 mg/m3 50 ppm

## PERSONAL PROTECTIVE EQUIPMENT

Respiratory Protection: Government approved respirator.

Hand Protection: Compatible chemical-resistant gloves.

Eye Protection: Chemical safety goggles.

## 9 - Physical and Chemical Properties

Appearance	Physical State: Solid Color: Colorless Form: Fine plates	
Property	Value	At Temperature or Pressure
pH	N/A	
BP/BP Range	172 - 173 °C	760 mmHg
MP/MP Range	52 °C	
Flash Point	66 °C	Method: closed cup
Flammability	N/A	
Autoignition Temp	N/A	
Oxidizing Properties	N/A	

Explosive Properties	N/A	
Explosion Limits	N/A	
Vapor Pressure	0.4 mmHg	25 °C
SG/Density	1.241 g/cm3	
Partition Coefficient	Log Kow: 3.4	
Viscosity	N/A	
Vapor Density	5.07 g/l	
Saturated Vapor Conc.	N/A	
Evaporation Rate	N/A	
Bulk Density	650 kg/l	
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: Oxidizing agents.

### HAZARDOUS DECOMPOSITION PRODUCTS

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

### HAZARDOUS POLYMERIZATION

Hazardous Polymerization: Will not occur

## 11 - Toxicological Information

RTECS NUMBER: CZ4550000

### ACUTE TOXICITY

LDLO  
Oral  
Human  
857 mg/kg

LD50  
Oral  
Rat  
500 mg/kg

LD50  
Skin  
Rat  
> 6000 mg/kg

LD50  
Intraperitoneal  
Rat  
2562 MG/KG

LD50  
Oral  
Mouse  
2950 mg/kg

LD50  
Intraperitoneal  
Mouse  
2 GM/KG

LD50  
Subcutaneous  
Mouse  
5145 MG/KG  
Remarks: Behavioral:Tremor.

LD50  
Oral  
Rabbit  
2830 mg/kg

LD50  
Skin  
Rabbit  
> 2000 mg/kg

LD50  
Oral  
Mammal  
2600 mg/kg

LC50  
Inhalation  
Mammal  
12,000 mg/m3

#### IRRITATION DATA

Eyes  
Human  
80 ppm

#### SIGNS AND SYMPTOMS OF EXPOSURE

Produces methemoglobin, nausea, vomiting, rapid pulse, headache, and visual disturbances.

#### ROUTE OF EXPOSURE

Skin Contact: Causes skin irritation.  
Skin Absorption: May be harmful if absorbed through the skin.  
Eye Contact: Causes eye irritation.  
Inhalation: Material is irritating to mucous membranes and upper respiratory tract. May be harmful if inhaled.  
Ingestion: Harmful if swallowed.

#### TARGET ORGAN INFORMATION

Liver. Kidneys. Blood. Nerves.

#### CHRONIC EXPOSURE - CARCINOGEN

Result: This product is or contains a component that has been reported to be possibly carcinogenic based on its IARC, ACGIH, NTP, or EPA classification.

Rat  
Route of Application: Oral  
Exposure Time: 2Y  
Result: Tumorigenic: Carcinogenic by RTECS criteria. Kidney, Ureter, Bladder: Kidney tumors.

Mouse  
Route of Application: Oral  
Exposure Time: 2Y  
Result: Tumorigenic: Carcinogenic by RTECS criteria. Liver: Tumors.

#### IARC CARCINOGEN LIST

Rating: Group 2B

#### CHRONIC EXPOSURE - MUTAGEN

Human  
100 UG/L  
Cell Type: lymphocyte  
Sister chromatid exchange

Rat  
800 MG/KG  
Intraperitoneal  
sperm

Mouse  
355 MG/KG  
Intraperitoneal  
24H  
Micronucleus test

Mouse  
2 GM/KG  
Intraperitoneal  
DNA damage

Mouse  
750 MG/KG  
Oral  
Other mutation test systems

#### CHRONIC EXPOSURE - TERATOGEN

Species: Rat  
Dose: 7500 MG/KG  
Route of Application: Oral  
Exposure Time: (6-15D PREG)  
Result: Specific Developmental Abnormalities: Musculoskeletal system.

Species: Rat  
Dose: 10 GM/KG  
Route of Application: Oral  
Exposure Time: (6-15D PREG)  
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

Species: Rabbit  
Dose: 800 PPM/6H  
Route of Application: Inhalation  
Exposure Time: (6-18D PREG)  
Result: Specific Developmental Abnormalities: Cardiovascular (circulatory) system.

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#### 12 - Ecological Information

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## ELIMINATION

Elimination: 67 %

## ECOTOXICOLOGICAL EFFECTS

Test Type: EC50 Daphnia

Species: Daphnia magna

Time: 48 h

Value: 0.7 mg/l

Test Type: EC50 Algae

Species: Scenedesmus subspicatus

Time: 48 h

Value: 28 mg/l

Test Type: LC50 Fish

Species: Brachydanio rerio

Time: 96 h

Value: 2.1 mg/l

Test Type: LC50 Fish

Species: Pimephales promelas (Fathead minnow)

Time: 96 h

Value: 4.2 mg/l

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## 13 - Disposal Considerations

### SUBSTANCE DISPOSAL

Contact a licensed professional waste disposal service to dispose of this material. This combustible material may be burned in a chemical incinerator equipped with an afterburner and scrubber. Observe all federal, state, and local environmental regulations.

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## 14 - Transport Information

### RID/ADR

UN#: 3077

Class: 9

PG: III

Proper Shipping Name: Environmentally hazardous substance, solid, n.o.s

### IMDG

UN#: 3077

Class: 9

PG: III

Proper Shipping Name: Environmentally hazardous substance, solid, n.o.s

Marine Pollutant: Yes

Severe Marine Pollutant: No

Technical Name: Required

### IATA

UN#: 3077

Class: 9

PG: III

Proper Shipping Name: Environmentally hazardous substance, solid, n.o.s

Inhalation Packing Group I: No

Technical Name: Required

CLASSIFICATION AND LABELING ACCORDING TO EU DIRECTIVES

ANNEX I INDEX NUMBER: 602-035-00-2

INDICATION OF DANGER: Xi N

Irritant. Dangerous for the environment.

R-PHRASES: 36 50/53

Irritating to eyes. Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

S-PHRASES: 24/25 46 60 61

Avoid contact with skin and eyes. If swallowed, seek medical advice immediately and show this container or label. This material and its container must be disposed of as hazardous waste. Avoid release to the environment. Refer to special instructions/safety data sheets.

COUNTRY SPECIFIC INFORMATION

Germany

WGK: 2

SWITZERLAND

SWISS POISON CLASS: 4

NORWAY

Labelling for organic solvents where the package is 1liter or more.

YL-tall m3/l: 3587

YL-group: 5

Risk phrases: 20

Harmful by inhalation.

Safety phrases: 38 42 210

In case of insufficient ventilation, wear suitable respiratory equipment. During fumigation/spraying wear suitable respiratory equipment. Use compressed air- or fresh air line breathing apparatus in confined spaces.

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16 - Other Information

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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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