

Material Safety Data Sheet

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Version 1.4

According to 91/155/EEC

Classified as Hazardous according to the criteria of EU Annex 1 and NOHSC.

1 - Product and Company Information

Product Name	1,4-PHENYLENEDIAMINE, FLAKES, 99.5+%
Product Number	P23962
Company	Sigma-Aldrich Pty. Ltd. 12 Anella Avenue Castle Hill NSW 2154 Australia
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2 - Composition/Information on Ingredients

Product Name	CAS #	EC no	Annex I Index Number
1,4-PHENYLENEDIAMINE	106-50-3	203-404-7	612-028-00-6

Formula	C6H8N2
Molecular Weight	108.14 AMU
Synonyms	p-Aminoaniline * 4-Aminoaniline * BASF ursol D * p-Benzenediamine * 1,4-Benzenediamine (9CI) * Benzofur D * C.I. 76060 * C.I. Developer 13 * C.I. Oxidation Base 10 * Developer 13 * Developer PF * p-Diaminobenzene * 1,4-Diaminobenzene * Durafur Black R * p-Fenylendiamin (Czech) * Fenylenodwuamina (Polish) * Fouramine D * Fourrine D * Fourrine 1 * Fur Black 41867 * FUR Brown 41866 * Furro D * Fur Yellow * Futramine D * Nako H * Orsin * Oxidation Base 10 * Paraphenylen-diamine * Pelagol D * Pelagol DR * Pelagol Grey D * Peltol D * 1,4-Phenylenediamine * p-Phenylenediamine (ACGIH:OSHA) * 6PPD * Renal PF * Rodol D * Santoflex IC * Tertral D * Ursol D * USAF EK-394 * Zoba Black D

3 - Hazards Identification

SPECIAL INDICATION OF HAZARDS TO HUMANS AND THE ENVIRONMENT

Toxic by inhalation, in contact with skin and if swallowed.

Irritating to eyes. May cause sensitization by skin contact. Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

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: Water spray. 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

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.

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.

8 - Exposure Controls / Personal Protection

ENGINEERING CONTROLS

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

GENERAL HYGIENE MEASURES

Wash contaminated clothing before reuse. Wash thoroughly after handling.

EXPOSURE LIMITS

Country	Source	Type	Value
Poland		NDS	0.1 MG/M3
Poland		NDSch	0.3 MG/M3
Poland		NDSP	-

EXPOSURE LIMITS - DENMARK

Source	Type	Value
OEL	TWA	0.1 mg/m3

Remarks: H

EXPOSURE LIMITS - GERMANY

Source	Type	Value
TRGS 900	OEL	0.1 mg/m3, E

Remarks: 4

Remarks: H

EXPOSURE LIMITS - NORWAY

Source	Type	Value
	OEL	0.1 mg/m3

Remarks: AH

EXPOSURE LIMITS - SWITZERLAND

Source	Type	Value
OEL	OEL	0.1 mg/m3

Remarks: E H S D

EXPOSURE LIMITS - UNITED KINGDOM

Source	Type	Value
OEL	OEL	0.1 mg/m3

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	
Property	Value	At Temperature or Pressure
pH	9	20 °C Concentration: 50 g/l
BP/BP Range	267 °C	760 mmHg
MP/MP Range	141 °C	
Flash Point	110 °C	Method: closed cup
Flammability	N/A	
Autoignition Temp	N/A	
Oxidizing Properties	N/A	
Explosive Properties	N/A	
Explosion Limits	Lower: 1.5 %	
Vapor Pressure	1.08 mmHg	100 °C
SG/Density	N/A	
Partition Coefficient	Log Kow: - 0.250	
Viscosity	N/A	
Vapor Density	3.7 g/l	
Saturated Vapor Conc.	N/A	
Evaporation Rate	N/A	
Bulk Density	600 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	Solubility in Water:10 mg/ml H ₂ O, 20°C Other Solvents: ALCOHOL, CHLOROFORM, ETHER

10 - Stability and Reactivity

STABILITY

Stable: Stable.

Conditions of Instability: May darken on storage

Materials to Avoid: Acid chlorides, Acid anhydrides,
Chloroformates, Strong oxidizing agents, Acids.

HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Nitrogen oxides Carbon monoxide,
Carbon dioxide.

HAZARDOUS POLYMERIZATION

Hazardous Polymerization: Will not occur

11 - Toxicological Information

RTECS NUMBER: SS8050000

ACUTE TOXICITY

LD50
Oral
Rat
80 mg/kg

LC50
Inhalation
Rat
920 mg/m³
4H

Remarks: Gastrointestinal:Nausea or vomiting. Behavioral:General
anesthetic. Kidney, Ureter, Bladder:Hematuria.

LD50
Intraperitoneal
Rat
37 MG/KG

LD50
Intraperitoneal
Mouse
50 MG/KG

LD50
Oral
Guinea pig
145 mg/kg

LD50
Oral
Quail
100 mg/kg

LD50

Oral
Bird (wild)
100 mg/kg

IRRITATION DATA

Skin
Human
250 mg
24H
Remarks: Mild irritation effect

Skin
Mouse
250 mg
24H
Remarks: Mild irritation effect

Skin
Dog
250 mg
24H
Remarks: Mild irritation effect

Skin
Rabbit
12.5 mg
24H
Remarks: Mild irritation effect

Skin
Rabbit
250 mg
24H
Remarks: Moderate irritation effect

Skin
Pig
250 mg
24H
Remarks: Mild irritation effect

Skin
Guinea pig
250 mg
24H
Remarks: Mild irritation effect

SENSITIZATION

Skin: May cause allergic skin reaction.

SIGNS AND SYMPTOMS OF EXPOSURE

Absorption into the body leads to the formation of methemoglobin which in sufficient concentration causes cyanosis. Onset may be delayed 2 to 4 hours or longer.

ROUTE OF EXPOSURE

Skin Contact: May cause skin irritation.
Skin Absorption: Toxic if absorbed through skin.
Eye Contact: Causes eye irritation.
Inhalation: Toxic if inhaled. Material may be irritating to mucous membranes and upper respiratory tract.

Ingestion: Toxic if swallowed.

TARGET ORGAN INFORMATION

Liver. Kidneys.

CHRONIC EXPOSURE - CARCINOGEN

Result: This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

Rat

Route of Application: Subcutaneous

Exposure Time: 30W

Result: Tumorigenic:Tumors at site or application.

Tumorigenic:Equivocal tumorigenic agent by RTECS criteria.

IARC CARCINOGEN LIST

Rating: Group 3

CHRONIC EXPOSURE - MUTAGEN

Rat

1850 NG/PLATE

Cell Type: Embryo

Morphological transformation.

Mouse

200 MG/KG

Oral

DNA inhibition

Hamster

15 MG/L

Cell Type: ovary

Cytogenetic analysis

12 - Ecological Information

ECOTOXICOLOGICAL EFFECTS

Test Type: EC50 Daphnia

Species: Daphnia magna

Time: 48 h

Value: 0.28 mg/l

Test Type: LC50 Fish

Species: Pimephales promelas (Fathead minnow)

Time: 96 h

Value: 0.06 mg/l

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#: 1673
Class: 6.1
PG: III
Proper Shipping Name: Phenylendiamines

IMDG
UN#: 1673
Class: 6.1
PG: III
Proper Shipping Name: PHENYLENEDIAMINES
Marine Pollutant: No
Severe Marine Pollutant: No

IATA
UN#: 1673
Class: 6.1
PG: III
Proper Shipping Name: PHENYLENEDIAMINES
Inhalation Packing Group I: No

15 - Regulatory Information

CLASSIFICATION AND LABELING ACCORDING TO EU DIRECTIVES

ANNEX I INDEX NUMBER: 612-028-00-6

INDICATION OF DANGER: T-N

Toxic. Dangerous for the environment.

R-PHRASES: 23/24/25-36-43-50/53

Toxic by inhalation, in contact with skin and if swallowed.

Irritating to eyes. May cause sensitization by skin contact.

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

S-PHRASES: 28-36/37-45-60-61

After contact with skin, wash immediately with plenty of soap-suds. Wear suitable protective clothing and gloves. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). 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: 3

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.
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