

MATERIAL SAFETY DATA SHEET

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Version 1.4

Section 1 - Product and Company Information

Product Name 2,4-DINITROPHENOL
Product Number D7004
Brand SIGMA

Company Sigma-Aldrich
Address 3050 Spruce Street
SAINT LOUIS MO 63103 US

Technical Phone: 800-325-5832
Fax: 800-325-5052
Emergency Phone: 314-776-6555

Section 2 - Composition/Information on Ingredient

Substance Name	CAS #	SARA 313
2,4-DINITROPHENOL, MOISTENED WITH APPROX. 20% WATER	51-28-5	Yes

Ingredient Name	CAS #	Percent	SARA 313
WATER	7732-18-5	<= 20	No

Formula C6H4N2O5

Synonyms Aldifen * Chemox PE * 2,4-Dinitrofenol (Dutch) * Dinitrofenolo (Italian) * alpha-Dinitrophenol * 2,4-Dinitrophenol * Dinofan * 2,4-Dnp * Fenoxyl carbon N * 1-Hydroxy-2,4-dinitrobenzene * Maroxol-50 * Nitro kleenup * NSC 1532 * Phenol, alpha-dinitro- * RCRA waste number P048 * Solfo Black B * Solfo Black BB * Solfo Black 2B Supra * Solfo Black G * Solfo Black SB * Tertrosulphur Black PB * Tertrosulphur PBR

RTECS Number: SL2800000

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Highly Toxic (USA) Toxic (EU). Dangerous for the environment. Explosive when dry. Toxic by inhalation, in contact with skin and if swallowed. Danger of cumulative effects. Irritating to eyes, respiratory system and skin. Very toxic to aquatic organisms. Target organ(s): Liver. Central nervous system. Readily absorbed through skin.

HMIS RATING

HEALTH: 3*
FLAMMABILITY: 3
REACTIVITY: 1

NFPA RATING

HEALTH: 3
FLAMMABILITY: 3
REACTIVITY: 1

*additional chronic hazards present.

For additional information on toxicity, please refer to Section 11.

Section 4 - First Aid Measures

ORAL EXPOSURE

If swallowed, wash out mouth with water provided person is conscious. Call a physician immediately.

INHALATION EXPOSURE

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

DERMAL EXPOSURE

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

EYE EXPOSURE

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.

Section 5 - Fire Fighting Measures

EXPLOSION HAZARDS

May explode when heated.

FLASH POINT

N/A

AUTOIGNITION TEMP

N/A

FLAMMABILITY

N/A

EXTINGUISHING MEDIA

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

FIREFIGHTING

Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.
Specific Hazard(s): Flammable solid. Emits toxic fumes under fire conditions.

Section 6 - Accidental Release Measures

PROCEDURE 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.

Section 7 - Handling and Storage

HANDLING

User Exposure: Do not breathe dust. Do not get in eyes, on skin, on clothing. Avoid prolonged or repeated exposure.

STORAGE

Suitable: Keep tightly closed.

SPECIAL REQUIREMENTS

Light sensitive. Heat sensitive.

Section 8 - Exposure Controls / PPE

ENGINEERING CONTROLS

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

PERSONAL PROTECTIVE EQUIPMENT

Respiratory: Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU). Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator.

Hand: Compatible chemical-resistant gloves.

Eye: Chemical safety goggles.

GENERAL HYGIENE MEASURES

Wash contaminated clothing before reuse. Wash thoroughly after handling.

Section 9 - Physical/Chemical Properties

Appearance

Physical State: Solid
Color: Light yellow
Form: Crystalline

Property	Value	At Temperature or Pressure
Molecular Weight	184.11 AMU	
pH	2.6 - 4.4	
BP/BP Range	N/A	
MP/MP Range	111 °C	
Freezing Point	N/A	
Vapor Pressure	< 0.001 mmHg	20 °C
Vapor Density	6.35 g/l	
Saturated Vapor Conc.	N/A	
SG/Density	1.683 g/cm ³	24 °C
Bulk Density	N/A	
Odor Threshold	N/A	
Volatile%	N/A	
VOC Content	N/A	
Water Content	N/A	
Solvent Content	N/A	
Evaporation Rate	N/A	
Viscosity	N/A	
Surface Tension	N/A	
Partition Coefficient	Log Kow: 1.67	
Decomposition Temp.	N/A	
Flash Point	N/A	

Explosion Limits	N/A
Flammability	N/A
Autoignition Temp	N/A
Refractive Index	N/A
Optical Rotation	N/A
Miscellaneous Data	N/A
Solubility	Solubility in Water:2.5 mg/ml H2O Other Solvents: ACETONE, CHLOROFORM PYRIDINE, ETHYL ACETATE

N/A = not available

Section 10 - Stability and Reactivity

STABILITY

Stable: Stable.

Conditions of Instability: Light sensitive. Heat sensitive.

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

HAZARDOUS DECOMPOSITION PRODUCTS

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

HAZARDOUS POLYMERIZATION

Hazardous Polymerization: Will not occur

Section 11 - Toxicological Information

ROUTE OF EXPOSURE

Skin Contact: Causes skin irritation.

Skin Absorption: Toxic if absorbed through skin.

Eye Contact: Causes eye irritation.

Inhalation: Toxic if inhaled. Material is irritating to mucous membranes and upper respiratory tract.

Ingestion: Toxic if swallowed.

TARGET ORGAN(S) OR SYSTEM(S)

Liver. Central nervous system. Eyes. Kidneys. Blood. Lungs.

SIGNS AND SYMPTOMS OF EXPOSURE

Disrupts oxidative phosphorylation which results in increased metabolism, consumption of oxygen and production of heat.

Exposure is characterized by sudden onset of fatigue, thirst, and sweating. Symptoms include nausea, vomiting, anorexia, weakness, dizziness, vertigo, headache, and sweating. Damage to the liver. Dermatitis. To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

TOXICITY DATA

Oral

Human

36 mg/kg

LDLO

Remarks: Nutritional and Gross Metabolic:Changes in:Body temperature increase. Cardiac: Change in rate. Behavioral:Coma.

Oral

Rat

30 mg/kg

LD50

Subcutaneous

Rat

25 MG/KG

LD50

Intravenous

Rat

72 MG/KG

LD50

Remarks: Behavioral:Convulsions or effect on seizure threshold.
Behavioral:Altered sleep time (including change in righting reflex). Lungs, Thorax, or Respiration:Respiratory stimulation.

Oral

Mouse

45 mg/kg

LD50

Remarks: Behavioral:Change in motor activity (specific assay).
Behavioral:Tetany. Behavioral:Ataxia.

Intraperitoneal

Mouse

26 MG/KG

LD50

Subcutaneous

Mouse

58 MG/KG

LD50

Remarks: Lungs, Thorax, or Respiration:Respiratory stimulation.
Behavioral:Convulsions or effect on seizure threshold.
Behavioral:Altered sleep time (including change in righting reflex).

Intravenous

Mouse

56 MG/KG

LD50

Remarks: Lungs, Thorax, or Respiration:Respiratory stimulation.
Behavioral:Convulsions or effect on seizure threshold.
Behavioral:Altered sleep time (including change in righting reflex).

Oral

Cat

75 mg/kg

LD50

Oral

Rabbit

30 mg/kg

LD50

Remarks: Behavioral:Tetany. Behavioral:Change in motor activity (specific assay). Behavioral:Ataxia.

Oral

Guinea pig

81 mg/kg

LD50

Remarks: Behavioral:Tetany. Behavioral:Ataxia. Behavioral:Change

in motor activity (specific assay).

Intraperitoneal
Guinea pig
28 MG/KG
LD50

Intramuscular
Pigeon
6500 UG/KG
LD50

Remarks: Nutritional and Gross Metabolic:Changes in:Body temperature increase.

Oral
Bird (wild)
13 mg/kg
LD50

IRRITATION DATA

Skin
Rabbit
300 mg
4W
I
Remarks: Mild irritation effect

CHRONIC EXPOSURE - TERATOGEN

Species: Mouse
Dose: 40800 UG/KG
Route of Application: Intraperitoneal
Exposure Time: (10-12D PREG)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

CHRONIC EXPOSURE - MUTAGEN

Species: Rat
Dose: 100 UMOL/L
Cell Type: liver
Mutation test: DNA damage

Species: Mouse
Route: Intraperitoneal
Dose: 10 GM/KG
Mutation test: Cytogenetic analysis

Species: Hamster
Dose: 7 MMOL/L
Cell Type: lung
Mutation test: DNA inhibition

CHRONIC EXPOSURE - REPRODUCTIVE HAZARD

Species: Rat
Dose: 2040 MG/KG
Route of Application: Oral
Exposure Time: (8D PRE-21D POST)
Result: Effects on Newborn: Weaning or lactation index (e.g., # alive at weaning per # alive at day 4). Effects on Newborn:

Stillbirth.

Section 12 - Ecological Information

ACUTE ECOTOXICITY TESTS

Test Type: EC50 Algae
Species: Scenedesmus subspicatus
Time: 48 h
Value: 40 mg/l

Test Type: EC50 Algae
Species: SELENASTRUM
Time: 72 h
Value: 5.550 - 17.4 mg/l

Test Type: EC50 Daphnia
Species: Daphnia magna
Time: 24 h
Value: 6.1 - 7.0 mg/l

Test Type: LC50 Fish
Species: Cyprinodon variegatus (Sheepshead minnow)
Time: 96 h
Value: 13.0 - 36.3 mg/l

Test Type: LC50 Fish
Species: Lepomis macrochirus (Bluegill)
Time: 96 h
Value: 1.760 - 5.9 mg/l

Section 13 - Disposal Considerations

APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION

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.

Section 14 - Transport Information

DOT

Proper Shipping Name: Dinitrophenol, wetted [with not less than 15 percent water, by mass]
UN#: 1320
Class: 4.1
Packing Group: Packing Group I
Hazard Label: Flammable solid
Hazard Label: Toxic substances.
PIH: Not PIH

IATA

Proper Shipping Name: Dinitrophenol, wetted
IATA UN Number: 1320
Hazard Class: 4.1
Packing Group: I

Section 15 - Regulatory Information

EU DIRECTIVES CLASSIFICATION

Symbol of Danger: T-N

Indication of Danger: Toxic. Dangerous for the environment.

R: 23/24/25-33-50

Risk Statements: Toxic by inhalation, in contact with skin and if swallowed. Danger of cumulative effects. Very toxic to aquatic organisms.

S: 28-37-45-61

Safety Statements: After contact with skin, wash immediately with plenty of water. Wear suitable gloves. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). Avoid release to the environment. Refer to special instructions/safety data sheets.

US CLASSIFICATION AND LABEL TEXT

Indication of Danger: Highly Toxic (USA) Toxic (EU). Dangerous for the environment.

Risk Statements: Explosive when dry. Toxic by inhalation, in contact with skin and if swallowed. Danger of cumulative effects. Irritating to eyes, respiratory system and skin. Very toxic to aquatic organisms.

Safety Statements: After contact with skin, wash immediately with plenty of water. Wear suitable gloves. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). Keep wet with water. Avoid release to the environment. Refer to special instructions/safety data sheets.

US Statements: Target organ(s): Liver. Central nervous system. Readily absorbed through skin.

UNITED STATES REGULATORY INFORMATION

SARA LISTED: Yes

DEMINIMIS: 1 %

NOTES: This product is subject to SARA section 313 reporting requirements.

TSCA INVENTORY ITEM: Yes

CANADA REGULATORY INFORMATION

WHMIS Classification: This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.

DSL: Yes

NDSL: No

Section 16 - Other Information

DISCLAIMER

For R&D use only. Not for drug, household or other uses.

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 2007 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.