Section 1 - Product and Company Information

Product Name                       2,4-DINITROPHENOL
Product Number                     D7004
Brand                              SIGMA
Company                            Sigma-Aldrich
Street Address                     3050 Spruce Street
City, State, Zip, Country          SAINT LOUIS MO 63103 US
Technical Phone:                   314 771 5765
Emergency Phone:                   414 273 3850 Ext. 5996
Fax:                               800 325 5052

Section 2 - Composition/Information on Ingredient

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

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.
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. Store in a cool dry place.

SPECIAL REQUIREMENTS

Section 8 - Exposure Controls / PPE

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

PERSONAL PROTECTIVE EQUIPMENT
Respiratory: Government approved 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

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
<th>At Temperature or Pressure</th>
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<tbody>
<tr>
<td>Appearance</td>
<td>Physical State: Solid</td>
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<tr>
<td></td>
<td>Color: Light yellow</td>
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<tr>
<td></td>
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<td>Molecular Weight</td>
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<td>MP/MP Range</td>
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<td>Freezing Point</td>
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<td>Vapor Pressure</td>
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<td>Decomposition Temp.</td>
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<td>Explosion Limits</td>
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<td>Miscellaneous Data</td>
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<td>Solubility</td>
<td>Solubility in Water: 2.5 mg/ml H2O</td>
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<td>Other Solvents: ACETONE, CHLOROFORM</td>
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<td></td>
<td>PYRIDINE, ETHYL ACETATE</td>
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</table>
Section 10 - Stability and Reactivity

STABILITY
Stable: Stable.
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)

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

Oral
Rat
30 mg/kg
LD50

Subcutaneous
Rat
25 MG/KG
LD50

Intravenous
Rat
72 MG/KG
LD50
Remarks: Behavioral: Altered sleep time (including change in righting reflex). Behavioral: Convulsions or effect on seizure threshold. Lungs, Thorax, or Respiration: Respiratory stimulation.

Oral
Mouse
45 mg/kg
LD50

Intraperitoneal
Mouse
26 MG/KG
LD50

Subcutaneous
Mouse
58 MG/KG
LD50
Remarks: Behavioral: Altered sleep time (including change in righting reflex). Behavioral: Convulsions or effect on seizure threshold. Lungs, Thorax, or Respiration: Respiratory stimulation.

Intravenous
Mouse
56 MG/KG
LD50
Remarks: Behavioral: Altered sleep time (including change in righting reflex). Behavioral: Convulsions or effect on seizure threshold. Lungs, Thorax, or Respiration: Respiratory stimulation.

Oral
Cat
75 mg/kg
LD50

Oral
Rabbit
30 mg/kg
LD50

Oral
Guinea pig
81 mg/kg
LD50

Intraperitoneal
Guinea pig
28 MG/KG
LD50

Intramuscular
Pigeon
6500 UG/KG
LD50

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: Stillbirth. Effects on Newborn: Weaning or lactation index (e.g., # alive at weaning per # alive at day 4).

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: 5.55 - 17.4 mg/l

Test Type: EC50 Daphnia  
Species: Daphnia magna  
Time: 24 h  
Value: 6.1 - 7 mg/l

Test Type: LC50 Fish  
Species: Cyprinodon variegatus (Sheepshead minnow)  
Time: 96 h  
Value: 13 - 36.3 mg/l

Test Type: LC50 Fish  
Species: Lepomis macrochirus (Bluegill)  
Time: 96 h  
Value: 1.76 - 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.

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. 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 2003 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.