

MATERIAL SAFETY DATA SHEET

Date Printed: 05/05/2008

Date Updated: 02/04/2006

Version 1.3

Section 1 - Product and Company Information

Product Name 4-NITROPHENOL, REAGENT GRADE, 98%
Product Number 425753
Brand ALDRICH

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
4-NITROPHENOL	100-02-7	Yes

Formula C6H5NO3
Synonyms 4-Hydroxynitrobenzene * NCI-C55992 * Niphen *
p-Nitrofenol (Czech) * 4-Nitrofenol (Dutch) *
4-Nitrophenol * Paranitrofenol (Dutch) *
Paranitrofenolo (Italian) * Paranitrophenol
(French,German) * RCRA waste number U170

RTECS Number: SM2275000

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Toxic (USA) Harmful (EU).

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

Readily absorbed through skin. Target organ(s): Blood. Nerves.

HMIS RATING

HEALTH: 2

FLAMMABILITY: 0

REACTIVITY: 0

NFPA RATING

HEALTH: 2

FLAMMABILITY: 0

REACTIVITY: 0

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.

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

FLASH POINT

336.2 °F 169 °C Method: closed cup

AUTOIGNITION TEMP

283 °C

FLAMMABILITY

N/A

EXTINGUISHING MEDIA

Suitable: 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): 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. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure.

STORAGE

Suitable: Keep tightly closed.

Section 8 - Exposure Controls / PPE

ENGINEERING CONTROLS

Safety shower and eye bath. Mechanical exhaust required.

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 dust mask type N95 (US) or type P1 (EN 143) respirator.

Hand: Compatible chemical-resistant gloves.

Eye: Chemical safety goggles.

GENERAL HYGIENE MEASURES

Wash thoroughly after handling.

Section 9 - Physical/Chemical Properties

Appearance	Physical State: Solid Color: Slightly yellow Form: Fine crystals	
Property	Value	At Temperature or Pressure
Molecular Weight	139.11 AMU	
pH	4.4	24 °C Concentration: 5 g/l
BP/BP Range	279 °C	760 mmHg
MP/MP Range	112 °C	
Freezing Point	N/A	
Vapor Pressure	0.6 mmHg	120 °C
Vapor Density	N/A	
Saturated Vapor Conc.	N/A	
SG/Density	1.479 g/cm ³	20 °C
Bulk Density	760 kg/l	
Odor Threshold	58.3 ppm	
Volatile%	N/A	
VOC Content	N/A	
Water Content	< 1 %	
Solvent Content	N/A	
Evaporation Rate	N/A	
Viscosity	2.56 Pas	121 °C
Surface Tension	N/A	
Partition Coefficient	Log Kow: 1.91	
Decomposition Temp.	N/A	
Flash Point	336.2 °F 169 °C	Method: closed cup
Explosion Limits	N/A	
Flammability	N/A	
Autoignition Temp	283 °C	
Refractive Index	N/A	
Optical Rotation	N/A	
Miscellaneous Data	N/A	
Solubility	Solubility in Water:15 mg/ml H ₂ O Other Solvents: ACETONE CHLOROFORM, ETHER, ETHANOL	

N/A = not available

Section 10 - Stability and Reactivity

STABILITY

Stable: Stable.

Materials to Avoid: Strong oxidizing agents, Strong bases.

HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide.

HAZARDOUS POLYMERIZATION

Section 11 - Toxicological Information

ROUTE OF EXPOSURE

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

TARGET ORGAN(S) OR SYSTEM(S)

Eyes. Central nervous system. Blood.

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. Depending on the intensity and duration of exposure, effects may vary from mild irritation to severe destruction of tissue. Damage to the eyes.

TOXICITY DATA

Oral
Rat
202 mg/kg
LD50
Remarks: Behavioral:Convulsions or effect on seizure threshold.
Behavioral:Somnolence (general depressed activity). Lungs, Thorax, or Respiration:Dyspnea.

Skin
Rat
1024 mg/kg
LD50

Oral
Mouse
282 mg/kg
LD50
Remarks: Behavioral:Tremor. Behavioral:Somnolence (general depressed activity). Behavioral:Convulsions or effect on seizure threshold.

Intraperitoneal
Mouse
75 MG/KG
LD50

Intracerebral
Mouse
90 MG/KG
LD50

Skin
Guinea pig
> 1000 mg/kg
LD50
Remarks: Skin and Appendages:Skin: After systemic exposure: Dermatitis, other

Oral
Mammal
247 mg/kg
LD50

Skin
Mammal
920 mg/kg
LD50

NTP CARCINOGEN LIST

Rating: No evidence.
Species: Mouse
Route: Skin

CHRONIC EXPOSURE - MUTAGEN

Species: Rat
Dose: 700 UMOL/L
Cell Type: liver
Mutation test: DNA damage

Section 12 - Ecological Information

ACUTE ECOTOXICITY TESTS

Test Type: EC50 Algae
Time: 48 h
Value: 11 mg/l

Test Type: EC50 Daphnia
Species: Daphnia magna
Time: 48 h
Value: 3.1 - 24.0 mg/l

Test Type: LC50 Fish
Species: Cyprinodon variegatus (Sheepshead minnow)
Time: 96 h
Value: 26.7 - 31.3 mg/l

Test Type: LC50 Fish
Species: Onchorhynchus mykiss (Rainbow trout)
Time: 96 h
Value: 3.8 - 18.0 mg/l

Test Type: LC50 Fish
Species: Pimephales promelas (Fathead minnow)
Time: 96 h
Value: 30.4 - 67.0 mg/l

ADDITIONAL RESULTS/DATA FROM RELEVANT SCIENTIFIC EXPERIMENTS

Because of harmful effects on water organisms, this material should not be introduced into drains.

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: Nitrophenols [(o-; m-; p-;)]
UN#: 1663
Class: 6.1
Packing Group: Packing Group III
Hazard Label: Toxic Substance
PIH: Not PIH

IATA

Proper Shipping Name: Nitrophenols
IATA UN Number: 1663
Hazard Class: 6.1
Packing Group: III

Section 15 - Regulatory Information

EU DIRECTIVES CLASSIFICATION

Symbol of Danger: Xn
Indication of Danger: Harmful.
R: 20/21/22-33
Risk Statements: Harmful by inhalation, in contact with skin and if swallowed. Danger of cumulative effects.
S: 28
Safety Statements: After contact with skin, wash immediately with plenty of polyethylene glycol.

US CLASSIFICATION AND LABEL TEXT

Indication of Danger: Toxic (USA) Harmful (EU).
Risk Statements: Harmful by inhalation, in contact with skin and if swallowed.
Safety Statements: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. After contact with skin, wash immediately with plenty of water. Wear suitable protective clothing, gloves, and eye/face protection. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
US Statements: Readily absorbed through skin. Target organ(s): Blood. Nerves.

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 2008 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.