

## MATERIAL SAFETY DATA SHEET

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Version 1.4

## Section 1 - Product and Company Information

Product Name 4-NITROANILINE, 99+%

Product Number 185310

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-NITROANILINE	100-01-6	Yes

Formula C6H6N2O2

Synonyms p-Aminonitrobenzene \* 1-Amino-4-nitrobenzene \* Aniline, 4-nitro- \* Azoamine Red ZH \* Azoic Diazo Component 37 \* Benzenamine, 4-nitro- (9CI) \* C.I. 37035 \* C.I. Azoic Diazo Component 37 \* C.I. Developer 17 \* Developer P \* Devol Red GG \* Diazo Fast Red GG \* Fast Red Base GG \* Fast Red Base 2J \* Fast Red 2G Base \* Fast Red GG Base \* Fast Red MP Base \* Fast Red P Base \* Naphtoelan Red GG Base \* NCI-C60786 \* p-Nitraniline \* 4-Nitraniline \* Nitrazol CF Extra \* p-Nitroanilina (Polish) \* p-Nitroaniline (ACGIH:OSHA) \* 4-Nitroaniline \* 4-Nitrobenzenamine \* p-Nitrophenylamine \* PNA \* RCRA waste number P077 \* Red 2G Base \* Shinnippon Fast Red GG Base

RTECS Number: BY7000000

## Section 3 - Hazards Identification

## EMERGENCY OVERVIEW

Toxic.

Toxic by inhalation, in contact with skin and if swallowed. Danger of cumulative effects. Irritating to eyes, respiratory system and skin. Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Target organ(s): Blood. Liver. Causes cyanosis. Readily absorbed through skin.

## HMIS RATING

HEALTH: 2\*

FLAMMABILITY: 0

REACTIVITY: 1

## NFPA RATING

HEALTH: 2

FLAMMABILITY: 0

REACTIVITY: 1

\*additional chronic hazards present.

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

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#### Section 4 - First Aid Measures

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##### 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.

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#### Section 5 - Fire Fighting Measures

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##### FLASH POINT

415.4 °F    213 °C    Method: closed cup

##### AUTOIGNITION TEMP

180 °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.

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#### Section 6 - Accidental Release Measures

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##### 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.

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#### Section 7 - Handling and Storage

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#### 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

Moisture sensitive.

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#### Section 8 - Exposure Controls / PPE

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#### ENGINEERING CONTROLS

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

#### 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 N99 (US) or type P2 (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.

#### EXPOSURE LIMITS, RTECS

Country	Source	Type	Value
USA	ACGIH	TWA	3 MG/M3
Remarks: Skin			
USA	MSHA Standard-air	TWA	1 PPM (6 MG/M3) (SKIN)
USA	OSHA.	PEL	8H TWA 1 PPM (6 MG/M3) (SKIN)
New Zealand OEL			
Remarks: check ACGIH TLV			
USA	NIOSH	TWA	3 MG/M3 (SK)

#### EXPOSURE LIMITS

Country	Source	Type	Value
Poland		NDS	3 MG/M3
Poland		NDSch	10 MG/M3
Poland		NDSP	-

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#### Section 9 - Physical/Chemical Properties

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#### Appearance

Color: Yellow

Form: Fine crystals

Odor: Ammonia odor

#### Property

Value

At Temperature or Pressure

Molecular Weight

138.13 AMU

pH

6.7

BP/BP Range

260 °C

100 mmHg

MP/MP Range

146 °C

Freezing Point

N/A

Vapor Pressure

0.004 mmHg

25 °C

Vapor Density

4.77 g/l

Saturated Vapor Conc.	N/A
SG/Density	1.44 g/cm <sup>3</sup>
Bulk Density	630 kg/l
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: 1.39
Decomposition Temp.	N/A
Flash Point	415.4 °F 213 °C      Method: closed cup
Explosion Limits	N/A
Flammability	N/A
Autoignition Temp	180 °C
Refractive Index	N/A
Optical Rotation	N/A
Miscellaneous Data	N/A
Solubility	Solubility in Water:Slightly.

N/A = not available

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## Section 10 - Stability and Reactivity

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### STABILITY

Stable: Stable.

Conditions to Avoid: This product generates heat as it absorbs moisture or water. Moisture.

Materials to Avoid: Strong acids, Strong oxidizing agents, Strong reducing agents, Plastics, Rubber.

### HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, and nitrogen oxides.

### HAZARDOUS POLYMERIZATION

Hazardous Polymerization: Will not occur

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## Section 11 - Toxicological Information

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### ROUTE OF EXPOSURE

Skin Contact: Causes skin irritation.

Skin Absorption: Toxic if absorbed through skin. Readily 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. Lungs. Heart. Blood.

### SIGNS AND SYMPTOMS OF EXPOSURE

Nausea. Drowsiness. Coughing, chest pains, difficulty in breathing. Unconsciousness. Headache. Cyanosis. p-Nitroaniline is readily absorbed by inhalation, ingestion, or skin absorption. It is a strong methemoglobin former. Cyanosis is the first manifestation of toxicity. To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated. Vomiting. Diarrhea. Ataxia.

Exposure can cause: Exposure to and/or consumption of alcohol may increase toxic effects. 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.

#### TOXICITY DATA

Oral  
Rat  
750 mg/kg  
LD50

Oral  
Mouse  
810 mg/kg  
LD50

Intraperitoneal  
Mouse  
250 MG/KG  
LD50

Intramuscular  
Mouse  
800 MG/KG  
LD50

Oral  
Guinea pig  
450 mg/kg  
LD50

Remarks: Behavioral:Convulsions or effect on seizure threshold.  
Behavioral:Somnolence (general depressed activity).

Skin  
Guinea pig  
> 500 mg/kg  
LD50

Oral  
Quail  
1000 mg/kg  
LD50

Oral  
Bird (wild)  
75 mg/kg  
LD50

#### CHRONIC EXPOSURE - CARCINOGEN

Species: Mouse  
Route of Application: Oral  
Dose: 51500 MG/KG  
Exposure Time: 2Y  
Frequency: I  
Result: Tumorigenic:Equivocal tumorigenic agent by RTECS  
criteria. Vascular:Tumors.

#### NTP CARCINOGEN LIST

Rating: Equivocal evidence.

Species: Mouse  
Route: Gavage

#### ACGIH CARCINOGEN LIST

Rating: A4

#### CHRONIC EXPOSURE - MUTAGEN

Species: Hamster  
Dose: 173 MG/L  
Cell Type: ovary  
Mutation test: Cytogenetic analysis

Species: Hamster  
Dose: 1600 MG/L  
Cell Type: ovary  
Mutation test: Sister chromatid exchange

#### CHRONIC EXPOSURE - REPRODUCTIVE HAZARD

Result: Overexposure may cause reproductive disorder(s) based on tests with laboratory animals.

Species: Rat  
Dose: 1764 MG/KG  
Route of Application: Oral  
Exposure Time: (14W MALE/14W PRE)  
Result: Effects on Fertility: Female fertility index (e.g., # females pregnant per # sperm positive females; # females pregnant per # females mated ).

Species: Mouse  
Dose: 9600 MG/KG  
Route of Application: Oral  
Exposure Time: (6-13D PREG)  
Result: Effects on Newborn: Growth statistics (e.g., reduced weight gain). Effects on Fertility: Litter size (e.g.; # fetuses per litter; measured before birth). Effects on Newborn: Live birth index (# fetuses per litter; measured after birth).

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#### Section 12 - Ecological Information

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#### ACUTE ECOTOXICITY TESTS

Test Type: EC50 Algae  
Time: 24 h  
Value: 68 mg/l

Test Type: EC50 Daphnia  
Species: Daphnia magna  
Time: 48 h  
Value: 17 mg/l

Test Type: LC50 Fish  
Species: Pimephales promelas (Fathead minnow)  
Time: 96 h  
Value: 85.7 - 142.0 mg/l

Test Type: LC50 Fish  
Species: Leuciscus idus  
Time: 48 h  
Value: 35 mg/l

Test Type: LC50 Fish  
Species: Brachydanio rerio  
Time: 96 h  
Value: 87.6 mg/l

ADDITIONAL RESULTS/DATA FROM RELEVANT SCIENTIFIC EXPERIMENTS

Avoid contamination of the environment

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Section 13 - Disposal Considerations

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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.

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Section 14 - Transport Information

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DOT

Proper Shipping Name: Nitroanilines [(o-; m-; p-)]  
UN#: 1661  
Class: 6.1  
Packing Group: Packing Group II  
Hazard Label: Toxic substances.  
PIH: Not PIH

IATA

Proper Shipping Name: Nitroanilines  
IATA UN Number: 1661  
Hazard Class: 6.1  
Packing Group: II

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Section 15 - Regulatory Information

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EU DIRECTIVES CLASSIFICATION

Symbol of Danger: T  
Indication of Danger: Toxic.  
R: 23/24/25-33-52/53  
Risk Statements: Toxic by inhalation, in contact with skin and if swallowed. Danger of cumulative effects. Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.  
S: 28-36/37-45-61  
Safety Statements: 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). Avoid release to the environment. Refer to special instructions/safety data sheets.

US CLASSIFICATION AND LABEL TEXT

Indication of Danger: Toxic.  
Risk Statements: Toxic by inhalation, in contact with skin and if swallowed. Danger of cumulative effects. Irritating to eyes, respiratory system and skin. Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.  
Safety Statements: 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). Avoid release to the environment. Refer to special instructions/safety data sheets.

US Statements: Target organ(s): Liver. Blood. Causes cyanosis. 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

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#### Section 16 - Other Information

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#### 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.