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### 1. PRODUCT AND COMPANY IDENTIFICATION

#### 1.1 Product identifiers

Product name : Nitrobenzene

Product Number : 06084  
Brand : Sigma-Aldrich  
Index-No. : 609-003-00-7

CAS-No. : 98-95-3

#### 1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

#### 1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.  
3050 Spruce Street  
ST. LOUIS MO 63103  
UNITED STATES

Telephone : +1 314 771-5765  
Fax : +1 800 325-5052

#### 1.4 Emergency telephone number

Emergency Phone # : (314) 776-6555

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### 2. HAZARDS IDENTIFICATION

#### 2.1 Classification of the substance or mixture

##### GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Flammable liquids (Category 4), H227

Acute toxicity, Oral (Category 3), H301

Acute toxicity, Inhalation (Category 3), H331

Acute toxicity, Dermal (Category 3), H311

Carcinogenicity (Category 2), H351

Reproductive toxicity (Category 1B), H360

Specific target organ toxicity - repeated exposure, Inhalation (Category 1), Blood, H372

Acute aquatic toxicity (Category 3), H402

Chronic aquatic toxicity (Category 3), H412

For the full text of the H-Statements mentioned in this Section, see Section 16.

## 2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word	Danger
Hazard statement(s)	
H227	Combustible liquid.
H301 + H311 + H331	Toxic if swallowed, in contact with skin or if inhaled.
H351	Suspected of causing cancer.
H360	May damage fertility or the unborn child.
H372	Causes damage to organs (/\$/*_ORG_REP_INHA/\$/) through prolonged or repeated exposure if inhaled.
H412	Harmful to aquatic life with long lasting effects.
Precautionary statement(s)	
P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P210	Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P271	Use only outdoors or in a well-ventilated area.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P310 + P330	IF SWALLOWED: Immediately call a POISON CENTER/doctor. Rinse mouth.
P302 + P352 + P312	IF ON SKIN: Wash with plenty of soap and water. Call a POISON CENTER or doctor/ physician if you feel unwell.
P304 + P340 + P311	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P362	Take off contaminated clothing and wash before reuse.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P403 + P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

## 2.3 Hazards not otherwise classified (HNOC) or not covered by GHS

Rapidly absorbed through skin.

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

### 3.1 Substances

Molecular weight	:	123.11 g/mol
CAS-No.	:	98-95-3
EC-No.	:	202-716-0
Index-No.	:	609-003-00-7

#### Hazardous components

Component	Classification	Concentration
<b>Nitrobenzene</b>	Flam. Liq. 4; Acute Tox. 3; Carc. 2; Repr. 1B; STOT RE 1; Aquatic Acute 3; Aquatic	<= 100 %

	Chronic 3; H227, H301 + H311 + H331, H351, H360, H372, H412	
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For the full text of the H-Statements mentioned in this Section, see Section 16.

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#### 4. FIRST AID MEASURES

##### 4.1 Description of first aid measures

###### General advice

Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

###### If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

###### In case of skin contact

Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

###### In case of eye contact

Flush eyes with water as a precaution.

###### If swallowed

Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

##### 4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

##### 4.3 Indication of any immediate medical attention and special treatment needed

No data available

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#### 5. FIREFIGHTING MEASURES

##### 5.1 Extinguishing media

###### Suitable extinguishing media

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

##### 5.2 Special hazards arising from the substance or mixture

Carbon oxides, Nitrogen oxides (NO<sub>x</sub>)

##### 5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

##### 5.4 Further information

Use water spray to cool unopened containers.

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#### 6. ACCIDENTAL RELEASE MEASURES

##### 6.1 Personal precautions, protective equipment and emergency procedures

Wear respiratory protection. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas. For personal protection see section 8.

##### 6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

##### 6.3 Methods and materials for containment and cleaning up

Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13). Keep in suitable, closed containers for disposal.

##### 6.4 Reference to other sections

For disposal see section 13.

## 7. HANDLING AND STORAGE

### 7.1 Precautions for safe handling

Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.  
Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge.  
For precautions see section 2.2.

### 7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.  
Storage class (TRGS 510): 6.1B: Non-combustible, acute toxic Cat. 1 and 2 / very toxic hazardous materials

### 7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### 8.1 Control parameters

#### Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Nitrobenzene	98-95-3	TWA	1 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Methemoglobinemia Confirmed animal carcinogen with unknown relevance to humans Danger of cutaneous absorption		
		TWA	1 ppm 5 mg/m <sup>3</sup>	USA. NIOSH Recommended Exposure Limits
		Potential for dermal absorption		
		TWA	1 ppm 5 mg/m <sup>3</sup>	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		Skin designation The value in mg/m <sup>3</sup> is approximate.		
		PEL	1 ppm 5 mg/m <sup>3</sup>	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		Skin		

#### Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
Nitrobenzene	98-95-3	Methemoglobin	1.5% Hb	In blood	ACGIH - Biological Exposure Indices (BEI)
	Remarks	During or at the end of the shift			

### 8.2 Exposure controls

#### Appropriate engineering controls

Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

#### Personal protective equipment

##### Eye/face protection

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

##### Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact

Material: butyl-rubber

Minimum layer thickness: 0.3 mm

Break through time: 480 min

Material tested: Butoject® (KCL 897 / Aldrich Z677647, Size M)

Splash contact

Material: Nature latex/chloroprene

Minimum layer thickness: 0.6 mm

Break through time: 40 min

Material tested: Lapren® (KCL 706 / Aldrich Z677558, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374

If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

### Body Protection

Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

### Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

### Control of environmental exposure

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

### 9.1 Information on basic physical and chemical properties

- |   |   |
|---|---|
| a) Appearance                                   | Form: liquid, clear<br>Colour: colourless, yellow                 |
| b) Odour  | pungent   |
| c) Odour Threshold                              | No data available   |
| d) pH   | 8.0 - 8.5 at 1.00000 g/l at 20.0 °C (68.0 °F)                     |
| e) Melting point/freezing point                 | Melting point/range: 5 - 6 °C (41 - 43 °F) - lit.                 |
| f) Initial boiling point and boiling range      | 210 - 211 °C (410 - 412 °F) - lit.                                |
| g) Flash point                                  | 88.0 °C (190.4 °F) - closed cup                                   |
| h) Evaporation rate                             | No data available   |
| i) Flammability (solid, gas)                    | No data available   |
| j) Upper/lower flammability or explosive limits | Upper explosion limit: 40 %(V)<br>Lower explosion limit: 1.8 %(V) |
| k) Vapour pressure                              | 66.7 hPa at 120.0 °C (248.0 °F)<br>0.3 hPa at 20.0 °C(68.0 °F)    |
| l) Vapour density                               | No data available   |
| m) Relative density                             | 1.196 g/mL at 25 °C (77 °F)                                       |
| n) Water solubility                             | 1.9 g/l at 20 °C (68 °F)  |
| o) Partition coefficient: n-octanol/water       | log Pow: 1.86 at 24.5 °C (76.1 °F)                                |
| p) Auto-ignition temperature                    | 482.0 °C (899.6 °F)   |

q) Decomposition temperature	No data available
r) Viscosity	No data available
s) Explosive properties	No data available
t) Oxidizing properties	No data available

## 9.2 Other safety information

Surface tension	43.4 mN/m at 20.0 °C (68.0 °F)
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## 10. STABILITY AND REACTIVITY

### 10.1 Reactivity

No data available

### 10.2 Chemical stability

Stable under recommended storage conditions.

### 10.3 Possibility of hazardous reactions

No data available

### 10.4 Conditions to avoid

Heat, flames and sparks.

### 10.5 Incompatible materials

Strong oxidizing agents, Strong reducing agents, Strong bases

### 10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Carbon oxides, Nitrogen oxides (NOx)  
Other decomposition products - No data available  
In the event of fire: see section 5

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## 11. TOXICOLOGICAL INFORMATION

### 11.1 Information on toxicological effects

#### Acute toxicity

LD50 Oral - Rat - male - 588 mg/kg

LC50 Inhalation - Rat - 4 h - 556 ppm

Remarks: Sense Organs and Special Senses (Nose, Eye, Ear, and Taste):Eye:Lacrimation. Behavioral:Tremor. Cyanosis

LD50 Dermal - Rabbit - 760 mg/kg

No data available

#### Skin corrosion/irritation

Skin - Rabbit

Result: No skin irritation - 24 h

#### Serious eye damage/eye irritation

Eyes - Rabbit

Result: No eye irritation

#### Respiratory or skin sensitisation

- Mouse

Result: Did not cause sensitisation on laboratory animals.  
(OECD Test Guideline 429)

#### Germ cell mutagenicity

unscheduled DNA synthesis assay

rat hepatocytes

Result: negative

OECD Test Guideline 474

Mouse - male and female

Result: negative

### **Carcinogenicity**

Suspected human carcinogens

IARC: 2B - Group 2B: Possibly carcinogenic to humans (Nitrobenzene)

NTP: RAHC - Reasonably anticipated to be a human carcinogen (Nitrobenzene)

OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

### **Reproductive toxicity**

Presumed human reproductive toxicant

### **Specific target organ toxicity - single exposure**

No data available

### **Specific target organ toxicity - repeated exposure**

Inhalation - Causes damage to organs through prolonged or repeated exposure. - Blood

Inhalation - Blood

### **Aspiration hazard**

No data available

### **Additional Information**

Repeated dose toxicity - Rat - male and female - Oral - 28 d - Lowest observed adverse effect level - 5 mg/kg

Repeated dose toxicity - Rat - male and female - Inhalation - 14 d

RTECS: DA6475000

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated., 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., Exposure to and/or consumption of alcohol may increase toxic effects.

Stomach - Irregularities - Based on Human Evidence

Stomach - Irregularities - Based on Human Evidence

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## **12. ECOLOGICAL INFORMATION**

### **12.1 Toxicity**

Toxicity to fish flow-through test LC50 - Danio rerio (zebra fish) - 92 mg/l - 96.0 h(Nitrobenzene)  
(OECD Test Guideline 203)

Toxicity to daphnia and other aquatic invertebrates static test EC50 - Daphnia magna (Water flea) - 35 mg/l - 48 h(Nitrobenzene)

Toxicity to algae Growth inhibition EC50 - Chlorella pyrenoidosa - 18 mg/l - 96 h(Nitrobenzene)  
(OECD Test Guideline 201)

### **12.2 Persistence and degradability**

Biodegradability aerobic - Exposure time 14 d(Nitrobenzene)  
Result: 3.3 % - Not readily biodegradable.  
(OECD Test Guideline 301C)

### **12.3 Bioaccumulative potential**

Bioaccumulation Cyprinus carpio (Carp) - 42 d  
at 25 °C - 0.125 mg/l(Nitrobenzene)

Bioconcentration factor (BCF): 3.1 - 4.8  
(OECD Test Guideline 305C)

#### 12.4 Mobility in soil

No data available(Nitrobenzene)

#### 12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

#### 12.6 Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.  
Harmful to aquatic life with long lasting effects.

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### 13. DISPOSAL CONSIDERATIONS

#### 13.1 Waste treatment methods

##### Product

This combustible material may be burned in a chemical incinerator equipped with an afterburner and scrubber. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

##### Contaminated packaging

Dispose of as unused product.

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### 14. TRANSPORT INFORMATION

#### DOT (US)

UN number: 1662      Class: 6.1      Packing group: II  
Proper shipping name: Nitrobenzene  
Reportable Quantity (RQ)      :      1000 lbs

Marine pollutant: no

Poison Inhalation Hazard: No

ALL INNER PACKAGINGS MUST BE IN METAL CANS FOR FXG

#### IMDG

UN number: 1662      Class: 6.1      Packing group: II      EMS-No: F-A, S-A  
Proper shipping name: NITROBENZENE  
Marine pollutant : yes

#### IATA

UN number: 1662      Class: 6.1      Packing group: II  
Proper shipping name: Nitrobenzene  
ALL INNER PACKAGINGS MUST BE IN METAL CANS FOR FX AIR

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### 15. REGULATORY INFORMATION

#### SARA 302 Components

The following components are subject to reporting levels established by SARA Title III, Section 302:

	CAS-No.	Revision Date
Nitrobenzene	98-95-3	2008-11-03

#### SARA 313 Components

The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Nitrobenzene	98-95-3	2008-11-03

#### SARA 311/312 Hazards

Fire Hazard, Acute Health Hazard, Chronic Health Hazard

#### Massachusetts Right To Know Components

	CAS-No.	Revision Date
Nitrobenzene	98-95-3	2008-11-03

#### Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Nitrobenzene	98-95-3	2008-11-03



## New Jersey Right To Know Components

Nitrobenzene	CAS-No. 98-95-3	Revision Date 2008-11-03
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## California Prop. 65 Components

WARNING! This product contains a chemical known to the State of California to cause cancer. Nitrobenzene	CAS-No. 98-95-3	Revision Date 2010-06-11
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WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. Nitrobenzene	CAS-No. 98-95-3	Revision Date 2010-06-11
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## 16. OTHER INFORMATION

### Full text of H-Statements referred to under sections 2 and 3.

H227	Combustible liquid.
H301	Toxic if swallowed.
H301 + H311 +	Toxic if swallowed, in contact with skin or if inhaled.
H331	
H311	Toxic in contact with skin.
H331	Toxic if inhaled.
H351	Suspected of causing cancer.
H360	May damage fertility or the unborn child.
H372	Causes damage to organs through prolonged or repeated exposure if inhaled.
H372	Causes damage to organs (/\$/*_ORG_REP_INHA/\$/) through prolonged or repeated exposure if inhaled.
H402	Harmful to aquatic life.
H412	Harmful to aquatic life with long lasting effects.

### HMIS Rating

Health hazard:	2
Chronic Health Hazard:	*
Flammability:	2
Physical Hazard	0

### NFPA Rating

Health hazard:	2
Fire Hazard:	2
Reactivity Hazard:	0

### Further information

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### Preparation Information

Sigma-Aldrich Corporation  
Product Safety – Americas Region  
1-800-521-8956  
Version: 6.0

Revision Date: 05/26/2018

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