

NITROBENZENE

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SECTION 1: IDENTIFICATION

1.1 GHS Product identifier:

NITROBENZENE
Oil of Mirbane; Nitrobenzol
CAS: 98-95-3

Other means of identification:

Not relevant

1.2 Recommended use of the chemical and restrictions on use:

Relevant uses: Chemical intermediate for aniline, rubber chemicals, pesticides, dyes and pharmaceuticals; solvent for cellulose ethers. For industrial user only.
Uses advised against: All uses not specified in this section or in section 7.3.

1.3 Supplier's details:

SURAJ CHEMICALS
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1.4 Emergency phone number:

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SECTION 2: HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture:

GHS:
Classification of this product has been carried out in accordance with the Globally Harmonized System of Classification and Labelling of Chemicals (GHS).

Acute Tox. 3 (oral)	Acute oral toxicity, Category 3, H301
Acute Tox. 3 (dermal)	Acute dermal toxicity, Category 3, H311
Acute Tox. 3 (inhalation)	Acute inhalation toxicity, Category 3, H331
Carc. 2	Carcinogenicity, Category 2, H351
Repr. 2	Reproductive toxicity, Category 2, H361
STOT RE 1	Specific target organ toxicity, repeated exposure, Category 1, H372 (blood, liver, spleen)
Aquatic Chronic 2	Hazardous to the aquatic environment, chronic hazard, Category 2, H411

2.2 GHS label elements, including precautionary statements:

GHS: Danger

Hazard statements:

H301: Toxic if swallowed.
H311: Toxic in contact with skin.
H331: Toxic if inhaled.
H351: Suspected of causing cancer.
H361: Suspected of damaging fertility or the unborn child.
H372: Causes damage to organs (blood, liver, spleen) through prolonged or repeated exposure.
H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.
P202: Do not handle until all safety precautions have been read and understood.
P260: Do not breathe dust/fume/gas/mist/vapours/spray.
P264: Wash hands and exposed 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.
P284: [In case of inadequate ventilation] wear respiratory protection.
P301+P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor.
P302+P352: IF ON SKIN: Wash with plenty of water.
P304+P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P308+P313: IF exposed or concerned: Get medical advice/attention.
P314: Get medical advice/attention if you feel unwell.
P391: Collect spillage.
P405: Store locked up.
P501: Dispose of the contents/containers in accordance with regulations on hazardous waste or packaging and packaging waste, respectively.

2.3 Other hazards which do not result in classification:

Readily absorbed through intact skin; a significant route of systemic exposure in addition to inhalation. Causes methaemoglobinaemia with cyanosis on significant absorption. Not a PBT/vPvB substance per available data.

SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS

3.1 Substances:

Chemical description: Nitrobenzene
In accordance with Annex 4.3.3 of the GHS, the product contains:

Identification	Chemical Name / Classification	Concentration
CAS: 98-95-3	Nitrobenzene — Acute Tox. 3: H301, H311, H331; Carc. 2: H351; Repr. 2: H361; STOT RE 1: H372; Aquatic Chronic 2: H411 – Danger	≥ 99% (typical commercial/industrial grade)

To obtain more information on the hazards of the substances, consult sections 11, 12 and 16.

3.2 Mixtures:

Non-applicable

SECTION 4: FIRST AID MEASURES

4.1 Description of necessary first-aid measures:

Request medical assistance immediately, showing the SDS of this product.

By inhalation:

Remove the person affected from the area of exposure to fresh air immediately and keep at rest. Monitor for signs of cyanosis (methaemoglobinaemia); administer oxygen if trained and available. Seek immediate medical attention.

By skin contact:

Remove contaminated clothing immediately. Wash skin thoroughly with plenty of water and soap for at least 15 minutes. Seek immediate medical attention – absorption through skin can cause systemic toxicity.

By eye contact:

Rinse eyes thoroughly with lukewarm water for at least 15 minutes, lifting eyelids occasionally. Remove contact lenses if present and easy to do. Seek immediate medical attention.

By ingestion/aspiration:

Do not induce vomiting (risk of aspiration). Rinse out the mouth. Seek immediate medical attention – keep the person at rest and monitor for cyanosis.

4.2 Most important symptoms/effects, acute and delayed:

Headache, dizziness, nausea, cyanosis (bluish discoloration of skin/lips due to methaemoglobinaemia), weakness, and in severe cases, convulsions and unconsciousness. Delayed effects on liver, spleen and blood may occur with repeated exposure. See sections 2 and 11.

4.3 Indication of immediate medical attention and special treatment needed, if necessary:

Methaemoglobinaemia may require treatment with methylene blue under medical supervision. Monitor liver and haematological parameters following significant exposure. Immediate medical attention is essential.

SECTION 5: FIRE-FIGHTING MEASURES

5.1 Suitable extinguishing media:

Suitable: Dry chemical powder, carbon dioxide, foam, water spray/fog

Unsuitable: High-pressure water jet (may spread burning liquid)

5.2 Specific hazards arising from the chemical:

Combustible liquid. Combustion or thermal decomposition may release toxic fumes including nitrogen oxides, carbon monoxide and carbon dioxide. Vapours may travel to an ignition source and flash back.

5.3 Special protective actions for fire-fighters:

Evacuate non-essential personnel. Wear self-contained breathing apparatus and full chemical-protective clothing. Approach from upwind.

Additional provisions:

Cool closed containers exposed to fire with water spray. Contain fire-fighting water run-off to prevent environmental release.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures:

For non-emergency personnel:

Evacuate the area. Eliminate ignition sources. Use PPE described in section 8, including respiratory protection. Prevent skin contact.

For emergency responders:

Wear full protective equipment including self-contained breathing apparatus and chemical-resistant suit. Keep unprotected persons away.

6.2 Environmental precautions:

Avoid at all cost any release into drains, watercourses or soil. Contain spillage immediately. Notify the relevant authority in case of significant environmental release.

6.3 Methods and materials for containment and cleaning up:

Contain spillage with inert absorbent material (sand, earth, vermiculite). Collect into a suitable, labelled, sealed, non-combustible container for disposal. Do not flush to drains. Ventilate the area thoroughly after clean-up.

6.4 Reference to other sections:

See sections 8 and 13.

SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling:

A. General precautions for safe use:

Avoid inhalation of vapour and all contact with skin and eyes. Use only in well-ventilated areas, preferably with local exhaust ventilation. Keep away from heat, sparks and open flame.

B. Technical recommendations for the prevention of fires and explosions:

Use explosion-proof electrical/ventilating/lighting equipment. Bond and ground equipment during transfer operations. Avoid contact with strong oxidizers and reducing agents.

C. Technical recommendations on general occupational hygiene:

Do not eat, drink or smoke while handling. Wash hands and exposed skin thoroughly after handling and before breaks. Remove and launder contaminated clothing before reuse.

D. Technical recommendations to prevent environmental risks:

Prevent release to drains and watercourses. Provide bunding for bulk storage. Follow the protective measures given in section 8.

7.2 Conditions for safe storage, including any incompatibilities:

A. Specific storage requirements:

Minimum Temp.	Ambient (above freezing point, ~5–6°C)
Maximum Temp.	30°C
Maximum time	12 Months (unopened, in original packaging)

B. General conditions for storage:

Store in a cool, dry, well-ventilated place, locked up and away from heat, open flame, strong oxidizers and reducing agents. Provide a containment bund around storage tanks.

7.3 Specific end use(s):

Except for the instructions already specified, it is not necessary to provide any special recommendation regarding the uses of this product.

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters:

Substances whose occupational exposure limits have to be assessed in the workplace, per the Factories Act, 1948 (Act No. 63 of 1948), as amended by the Factories (Amendment) Act, 1987 (Act 20 of 1987):

Identification	Occupational Exposure Limit Type	Value
Nitrobenzene CAS: 98-95-3	Time Weighted average concentration (8 hrs), skin notation	1 ppm / 5 mg/m³ (skin absorption significant)

8.2 Appropriate engineering controls:

Use closed systems and local exhaust ventilation to keep exposure below occupational exposure limits. Minimize manual handling and skin contact opportunities.

B. Respiratory protection:

Use an organic vapour respirator with full-face mask where exposure limits may be exceeded; use self-contained breathing apparatus in enclosed or high-concentration areas.

C. Specific protection for the hands:
Chemical-resistant gloves tested for nitrobenzene permeation (e.g. Viton, specialty laminate); nitrile/neoprene offer limited protection against prolonged contact – follow manufacturer's permeation data and replace regularly.

D. Eye and face protection:
Chemical safety goggles and face shield.

E. Bodily protection:
Impervious chemical-protective clothing (apron/coveralls) covering all exposed skin. Safety footwear, chemical resistant.

F. Additional emergency measures:
Emergency shower and eyewash stations must be readily available in the work area.

Environmental exposure controls:
Avoid environmental spillage of both the product and its container. See subsection 7.1.D.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties:

Appearance	
Physical state at 20°C	Liquid
Appearance	Pale yellow oily liquid
Color	Pale yellow
Odor	Characteristic almond/shoe-polish-like odour
Odour threshold	~0.02–0.1 ppm (typical)
Volatility	
Boiling point at atmospheric pressure	210–211°C
Vapour pressure at 20°C	~0.2–0.3 mm Hg
Evaporation rate at 20°C	Low (slower than water)
Product Description	
Density / Relative density at 20°C	~1.20 g/cm³
Dynamic / Kinematic viscosity at 20°C	~2.0 cP (typical)
Concentration	≥99% (typical commercial grade)
pH	Non-applicable (immiscible with water)
Vapour density at 20°C	~4.25 (air = 1)
Partition coefficient n-octanol/water (log Pow)	~1.85
Solubility in water at 20°C	~0.2 g/100 mL (slightly soluble); miscible with most organic solvents
Decomposition temperature	Typical value – refer to current specification sheet
Melting point/freezing point	5–6°C
Flammability	
Flash Point	88–90°C (closed cup, typical)
Flammability (solid, gas)	Non-applicable (liquid); combustible
Autoignition temperature	~480°C
Lower / Upper flammability limit	1.8% / 40% (v/v in air, typical)
Particle Characteristics	
Median equivalent diameter	Non-applicable (liquid)

* Values are typical for the commercial grade; refer to current specification sheet for batch-specific data.

9.2 Other information:

Explosive properties	Not classified as explosive; vapour/air mixtures may be flammable within limits
Oxidising properties	Not relevant – not an oxidiser
Corrosive to metals	Not relevant
Heat of combustion	Typical value – refer to current specification sheet
Surface tension at 20°C	~43 mN/m (typical)
Refraction index	~1.55 (typical)

SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity:
Stable under normal conditions of use. Reacts violently with strong oxidizing agents, strong reducing agents, strong acids and strong bases. Can form shock-sensitive/explosive mixtures with certain reducing metals and some organics.

10.2 Chemical stability:
Chemically stable under the indicated conditions of storage, handling and use.

10.3 Possibility of hazardous reactions:
Hazardous exothermic/violent reactions possible with strong oxidizers, strong reducing agents (e.g. metal hydrides), and under conditions of excessive heat.

10.4 Conditions to avoid:

Shock/Friction	Contact with Air	Increase in Temperature	Sunlight	Humidity
Not applicable	Not applicable	Keep away from heat/ignition sources	No special measures	No special measures

10.5 Incompatible materials:

Strong Oxidizers	Strong Reducing Agents	Strong Acids/Bases
Avoid contact – fire/explosion risk	Avoid contact – violent reaction risk	Avoid contact

10.6 Hazardous decomposition products:
Thermal decomposition/combustion may release nitrogen oxides, carbon monoxide and carbon dioxide.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects:
Per well-established published data for this CAS number, nitrobenzene presents significant toxicity via all routes of exposure, including skin absorption:

A. Ingestion (acute effect):
Toxic if swallowed. Causes methaemoglobinaemia (cyanosis), headache, nausea, vomiting and, at higher doses, convulsions and unconsciousness.

B. Inhalation (acute effect):
Toxic if inhaled. Vapour causes headache, dizziness, nausea, cyanosis and, at high concentrations, respiratory depression and unconsciousness.

C. Contact with skin and eyes (acute effect):
Toxic in contact with skin – readily absorbed, producing systemic toxicity (methaemoglobinaemia) without necessarily causing local irritation. May cause mild eye irritation.

D. CMR effects (carcinogenicity, mutagenicity, reproductive toxicity):
Suspected of causing cancer (Carc. 2, H351) based on animal studies. Suspected of damaging fertility or the unborn child (Repr. 2, H361). IARC: Group 2B (possibly carcinogenic to humans). Not classified as a germ cell mutagen based on available data.

E. Sensitizing effects:
Not classified as a skin or respiratory sensitizer based on available data.

F. Specific target organ toxicity (STOT) – single exposure:
Causes methaemoglobinaemia and CNS effects on acute exposure; captured under Acute Tox. classifications above.

G. Specific target organ toxicity (STOT) – repeated exposure:
Causes damage to organs (blood, liver, spleen) through prolonged or repeated exposure (STOT RE 1, H372), based on animal studies showing haematological changes and organ pathology.

H. Aspiration hazard:
Low-viscosity liquid; aspiration into the lungs during ingestion/vomiting may cause chemical pneumonitis.

Product-specific toxicological information:

Identification	Acute Toxicity	Genus
Nitrobenzene CAS: 98-95-3	LD50 oral: 349 mg/kg	Rat
	LD50 dermal: ~700 mg/kg	Rabbit
	LC50 inhalation: ~1000 mg/m³ (4h)	Rat

SECTION 12: ECOLOGICAL INFORMATION

Toxic to aquatic life with long lasting effects.

12.1 Toxicity:

Acute Toxicity	Species	Genus
LC50: 24–31 mg/L (96h)	Non-applicable	Fish
EC50: ~27 mg/L (48h)	Non-applicable	Crustacean (Daphnia magna)

12.2 Persistence and degradability:
Not readily biodegradable under standard test conditions (inherently biodegradable under some conditions, but slow); may persist in the aquatic environment in the short to medium term.

12.3 Bioaccumulative potential:
Low to moderate bioaccumulation potential indicated by log Pow (~1.85); low BCF values reported.

12.4 Mobility in soil:

Koc	Henry	Dry Soil	Moist Soil
Low to moderate (~65–130 typical)	Low	Moderate to high mobility possible	Moderate to high mobility possible

12.5 Results of PBT and vPvB assessment:
Not classified as PBT/vPvB under available regulatory frameworks.

12.6 Other adverse effects:
Not described

SECTION 13: DISPOSAL CONSIDERATIONS

13.1 Disposal methods:
Dispose of in accordance with local, state and national hazardous waste regulations. Incineration at a licensed hazardous waste facility with appropriate flue gas treatment is the preferred disposal route. Do not discharge to drains or watercourses. For packaging: avoid treatments as far as possible – use dedicated containers.
Refer to national and local regulations on waste management.

SECTION 14: TRANSPORT INFORMATION

Transport of dangerous goods by land (ADR 2023 / RID 2023):

14.1 UN number	UN1662
14.2 UN proper shipping name	NITROBENZENE
14.3 Transport hazard class(es)	6.1
14.4 Packing group	II
14.5 Environmental hazard	Yes
14.6 Special precautions for user	Physico-chemical properties: see section 9
14.7 Transport in bulk (Annex II MARPOL 73/78, IBC Code)	Not relevant

Transport of dangerous goods by sea (IMDG 41-22):

14.1 UN number	UN1662
14.2 UN proper shipping name	NITROBENZENE
14.3 Transport hazard class(es)	6.1
14.4 Packing group	II
14.5 Marine pollutant	Yes
14.6 Special precautions for user	EmS Codes: F-A, S-A Limited quantities: 0 Segregation group: Not relevant
14.7 Transport in bulk (Annex II MARPOL 73/78, IBC Code)	Not relevant

Transport of dangerous goods by air (IATA/ICAO 2024):

14.1 UN number	UN1662
14.2 UN proper shipping name	NITROBENZENE
14.3 Transport hazard class(es)	6.1
14.4 Packing group	II
14.5 Environmental hazard	Yes
14.6 Special precautions for user	Physico-chemical properties: see section 9
14.7 Transport in bulk (Annex II MARPOL 73/78, IBC Code)	Not relevant

SECTION 15: REGULATORY INFORMATION

15.1 Safety, health and environmental regulations specific for the product in question:

It is recommended to use the information included in this safety data sheet as data used in a risk evaluation of local circumstances, in order to establish the necessary risk prevention measures for the manipulation, use, storage and disposal of this product.

Other legislation:

- Manufacture, Storage and Import of Hazardous Chemicals Rules 1989
- The Factories Act, 1948 (Act No. 63 of 1948), as amended by the Factories (Amendment) Act, 1987 (Act 20 of 1987)
- The Chemical Accidents (Emergency Planning, Preparedness, and Response) Rules, 1996
- Public Liability Insurance Act, 1991

SECTION 16: OTHER INFORMATION

Legislation related to safety data sheets:

This safety data sheet has been designed in accordance with Annex 4 – Guidance on the preparation of Safety Data Sheets of the Globally Harmonized System of Classification and Labelling of Chemicals (GHS).

Texts of the legislative phrases mentioned in sections 2 and 3:

- H301: Toxic if swallowed.
- H311: Toxic in contact with skin.
- H331: Toxic if inhaled.
- H351: Suspected of causing cancer.
- H361: Suspected of damaging fertility or the unborn child.
- H372: Causes damage to organs through prolonged or repeated exposure.
- H411: Toxic to aquatic life with long lasting effects.

The phrases indicated do not refer to the product itself; they are present merely for informative purposes and refer to the individual components which appear in section 3.

Advice related to training:

Comprehensive training is strongly recommended for staff handling this product, given its significant acute and chronic toxicity profile, to ensure full comprehension and interpretation of this safety data sheet and the label.

Principal bibliographical sources:

Published GHS classification data, IARC monographs and standard chemical reference sources for CAS 98-95-3.

Abbreviations and acronyms:

ADR: European agreement concerning the international carriage of dangerous goods by road | IMDG: International maritime dangerous goods code | IATA: International Air Transport Association | ICAO: International Civil Aviation Organisation | BCF: Bioconcentration factor | LD50: Lethal Dose 50 | LC50: Lethal Concentration 50 | EC50: Effective Concentration 50 | Log-POW: Octanol-water partition coefficient | Koc: Partition coefficient of organic carbon | IARC: International Agency for Research on Cancer

The information contained in this safety data sheet is based on sources, technical knowledge and current legislation, without being able to guarantee its accuracy. This information cannot be considered a guarantee of the properties of the product; it is simply a description of the security requirements. The occupational methodology and conditions for users of this product are not within Suraj Chemicals' awareness or control, and it is ultimately the responsibility of the user to take the necessary measures to obtain the legal requirements concerning the manipulation, storage, use and disposal of chemical products. The information on this safety data sheet only refers to this product, which should not be used for needs other than those specified.

END OF SAFETY DATA SHEET