GPS Safety Summary

Nitrobenzene

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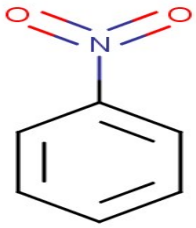
1. General Statement

Nitrobenzene is an oily yellow liquid with an almond-like odor. It may be pale yellow-brown in appearance. It dissolves only slightly in water, but very easily in some other chemicals. Nitrobenzene is produced in large quantities for industrial use. It is combustible substance, poorly flammable (flash point > 60 up to 93°C).Vapours may form explosive mixtures with air when the substance is heated above its flash point.Slightly soluble in water.Heavier than water.Low or very low-volatile.Acute or chronic health hazards result from the substance.The substance is hazardous to the aquatic environment.

2. Chemical identity

Name : Nitrobenzene
CAS number(s) : 98-95-3
EC number : 202-716-0
Molecular formula : C6H5NO2
Structure :



3. Uses and Benefits

Nitrobenzene is used primarily in the production of aniline, but it is also used as a solvent and as an ingredient in metal polishes and soaps. Nitrobenzene is also used as a solvent in petroleum refining, as a solvent in the manufacture of cellulose ethers and cellulose acetate

4. Physical / chemical properties

Property	Value
Physical state :	Liquid
Colour :	Colourless to dark brown.
Odour :	Almond odour. Oil-like odour.

pH :	8 (0.1 %)
Melting point	5.26 °C
Boiling point :	210.8 °C (1013 hPa)
Flash point :	88 °C (1013 hPa)
Flammability (solid, gas) :	No data available
Vapour pressure :	0.2 hPa (20 °C)
Density :	1200 kg/m3 (20 °C)
Water:	0.19 g/100ml (20 °C, EU Method A.6: Water solubility)

5. Health Effects

Effect Assessment	Result
Acute toxicity (Oral / inhalation / dermal)	Toxic if swallowed,in contact with skin or Toxic if inhaled.
Irritation / corrosion Skin / eye/ respiratory tract	NA
Respiratory or skin sensitisation	NA
Toxicity after repeated exposure Oral / inhalation / dermal	Causes damage to organs (blood) through prolonged or repeated exposure.
Genotoxicity / Mutagenicity	NA
Carcinogenicity	Suspected of causing cancer.
Toxicity for reproduction	May damage fertility.

6. Environmental Effects

Effect Assessment	Result
Aquatic toxicity	Yes
Fate and behavior	**Result**
Persistence and degradability	Biodegradable in the soil. Inhibition of nitrification. Not readily biodegradable in water.
Bioaccumulative potential	Low potential for bioaccumulation (BCF < 500).

7. Exposure

Human health

The substance may cause cancer and may damage fertility. Nitrobenzene can cause a wide variety of harmful health effects to expose persons. Direct contact of small amounts of nitrobenzene with the skin or eyes may cause mild irritation. Repeated exposures to a high concentration of nitrobenzene can result in a blood condition called methemoglobinemia. This condition affects the ability of the blood to carry oxygen. Following such an exposure, the skin may turn a bluish color. This may be accompanied by nausea, vomiting and shortness of breath. Effects such as headache, irritability, dizziness, weakness, and drowsiness may also occur. If the exposure level is extremely high, nitrobenzene can cause coma and possibly death unless prompt medical treatment is received.
Consuming alcoholic beverages during nitrobenzene exposure may increase the harmful effects of nitrobenzene. In studies with laboratory animals, a single dose of nitrobenzene fed to male rats resulted in damage to the testicles and decreased levels of sperm. This suggests that decreased fertility may be a concern in humans.
The most likely route of human exposure (workers) is through skin. In industrial settings, ingestion is not an anticipated route of exposure.The probability of exposure to workers is expected to be low because this product is manufactured in an enclosed controlled environment and is transported in well sealed containers. Workers may be exposed during (un)loading, mixing, sampling, analysis or maintenance operations and particularly in case of batch processes.The exposure must be kept as minimum as possible by the use of appropriate risk management measures as suitable collective and personal protective equipment, good industrial hygiene practices and risk communication through appropriate training of workers.
Careless handling or accidental spillage of the chemical could result in exposure to potentially hazardous levels of chemicals.
Industrial workers should ensure that they follow the advice found in the extended safety data sheet (SDS).

Environment

Substance is very toxic to aquatic life with long lasting effects. Care should be taken to avoid releases of these products to sewage, drainage systems and water bodies. Spillage shall be quickly collected in the event of an accidental release. More information about release measures and accidental release measures are available in the extended safety data sheet.

8. Risk Management Recommendations

Human health measures

Organizational	A basic standard of occupational hygiene is recommended. Ensure operatives are well informed of the hazards and trained to minimise exposures.Ensure regular inspection and maintenance of equipment and machines.Handle and store according to the indications of the Safety Data Sheet.	
Protection	Eye protection:	Safety glasses,Face shield (EN 166)
	Skin and body protection:	Wear suitable protective clothing,Protective clothing (EN 14605 or EN 13034)

	Respiratory protection:	Wear an appropriate mask. Self-contained breathing apparatus,Mist formation: aerosol mask with filter type P3. Full face mask with filter type A at conc. in air > exposure limit. High vapour/gas concentration: compressed air apparatus (EN 136 + EN 137)
Engineering controls	Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.Ensure good ventilation of the work station.	
Environment protective measures		
Products must not be released into water without pre-treatment. Neutralize wastewater before release.		

9. First-aid measures

First-aid measures after inhalation : Remove the person to fresh air and keep them comfortable for breathing. Call a physician immediately.Doctor: administration of corticoid spray. Assure fresh air breathing. Take medical advice.

First-aid measures after skin contact : Wash skin with plenty of water. Remove/Take off immediately all contaminated clothing.

First-aid measures after eye contact : Rinse eyes with water as a precaution.

First-aid measures after ingestion : Rinse mouth. Call a physician immediately.

10. Fire-fighting measures

Extinguishing media
Suitable extinguishing media **:** Water spray. Dry powder. Foam. Carbon dioxide.

Unsuitable extinguishing media **:** Water (quick-acting extinguisher, reel); risk of puddle expansion. Water; risk of puddle expansion.

Special hazards arising from the substance or mixture
Hazardous decomposition products in case of fire : On burning: release of toxic and corrosive gases/vapours (nitrous vapours, carbon monoxide - carbon dioxide).

Advice for firefighters
Precautionary measures fire : Exposure to fire/heat: keep upwind. Exposure to fire/heat: consider evacuation. Exposure to fire/heat: have neighbourhood close doors and windows.

Firefighting instructions : Fight fire from safe distance and protected location. Do not enter fire area without proper protective equipment, including respiratory protection.

11. Accidental release measures

Protective equipment : Gloves (EN 374). Face shield (EN 166). Protective clothing (EN 14605 or EN 13034). Large spills/in enclosed spaces: compressed air apparatus (EN 136 + EN 137). Large spills/in enclosed spaces: gas-tight suit (EN 943).

Environmental precautions : Avoid release to the environment. Notify authorities if a product enters sewers or public waters.

For containment : Absorb spilled material with sand or earth. Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams. Stop leaks without risks if possible.

12. Disposal consideration

Regional legislation (waste) : Disposal must be done according to official regulations.

Waste treatment methods : Dispose of contents/container in accordance with licensed collector's sorting instructions.

Sewage disposal recommendations : Do not discharge into drains or the environment. Dispose of an authorized waste collection point. Remove waste in accordance with local and/or national regulations. Hazardous waste shall not be mixed together with other waste. Different types of hazardous waste shall not be mixed together if this may entail a risk of pollution or create problems for the further management of the waste. Hazardous waste shall be managed responsibly. All entities that store, transport or handle hazardous waste shall take the necessary measures to prevent risks of pollution or damage to people or animals.

13. Handling and storage

Precautions for safe handling : Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Wear personal protective equipment. Obtain special instructions before use. Do not handle it until all safety precautions have been read and understood. Do not breathe dust/fume/gas/mist/vapors/spray. Do not get in eyes, on skin, or on clothing. Use only outdoors or in a well-ventilated area.

Hygiene measures : Separate working clothes from town clothes. Launder separately. Wash contaminated clothing before reuse. Do not eat, drink or smoke when using this product. Always wash hands afterhandling the product.

14. Classification and Labeling

GHS US labeling

Hazard pictograms (GHS US) :

Signal word (GHS US) : Danger

Hazard statements (GHS US) : 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 through prolonged or repeated exposure
H412 - Harmful to aquatic life with long lasting effects

Precautionary statements (GHS US) : P201 - Obtain special instructions before use.
P202 - Do not handle until all safety precautions have been read and understood.
P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P260 - Do not breathe dust, fume, gas, mist, vapors, spray.
P264 - Wash hands, forearms and face 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, and hearing protection.

15. Conclusion

Nitrobenzene is an oily yellow liquid. It may be pale yellow-brown in appearance. The substance may cause cancer and may damage fertility. Nitrobenzene can cause a wide variety of harmful health effects to exposed persons.Substance is very toxic to aquatic life with long lasting effects. Care should be taken to avoid releases of these products to sewage, drainage systems and water bodies. The exposure must be kept as minimum as possible by the use of appropriate risk management measures as suitable collective and personal protective equipment, good industrial hygiene practices and risk communication through appropriate training of workers.

16. Contact Information within company

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information, consult the appropriate Safety Data Sheet (SDS) prior to use of the material named herein.