GPS Safety Summary
4-chloro-2-nitrotoluene

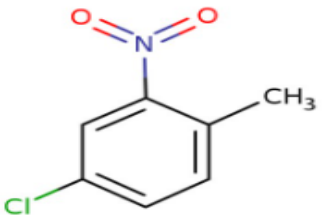
Reference number: AIL-GPS-130 Issue date: 18/06/2025 Version: 1.0 **CL-4: PUBLIC**

1. General Statements

4-chloro-2-nitrotoluene is a yellow to orange crystalline solid, exhibiting slight water solubility and combustible, but only poorly flammable, properties. It poses potential acute or chronic health hazards upon exposure. Additionally, when finely powdered and dispersed in air, it presents a significant risk of dust explosion if an ignition source is present. Proper handling, storage, and safety measures are essential to mitigate these risks.

2. Chemical identification.

Name :4-chloro-2-nitrotoluene
CAS number(s) :89-59-8
EC number :201-921-2
Molecular formula :C7H6ClNO2
Structure :



3. Uses and Benefits

It is used as a key starting material in the manufacture of indigo dye, which is widely used in the textile industry.Used in the synthesis of potential NMDA-glycine antagonists, compounds that can modulate neurotransmitter receptors and have potential applications in neurological therapies.Involved in the production of COX-2 inhibitors, a class of anti-inflammatory drugs with selective inhibition properties, reducing side effects compared to traditional NSAIDs.

4. Physical / chemical properties

Property	Value
Physical state :	Solid
Colour :	light yellow
Odour :	Odourless
pH :	NA
Melting point :	34 – 38 °C
Boiling point :	239 - 240 °C at 957 hPa - lit.
Flash point :	120 °C - closed cup

GPS Safety Summary
4-chloro-2-nitrotoluene
CL-4:PUBLIC

Density :	1.3±0.1 g/cm3(Predicted)
Solubility in Water:	Immiscible

5. Health Effects

Effect Assessment	Result
Acute toxicity (Oral / inhalation / dermal)	NA
Irritation / corrosion Skin / eye/ respiratory tract	Causes skin irritation,Causes serious eye irritation,It may also May cause respiratory irritation
Respiratory or skin sensitisation	NA
Toxicity after repeated exposure Oral / inhalation / dermal	It may cause damage to organs through prolonged or repeated exposure
Genotoxicity / Mutagenicity	NA
Carcinogenicity	NA
Toxicity for reproduction	NA

6. Environmental Effects

Effect Assessment	Result
Aquatic toxicity	Yes
Fate and behavior	**Result**
Persistence and degradability	Not rapidly degradable
Bioaccumulative potential	No additional information available

7. Exposure

Human health

4-chloro-2-nitrotoluene causes skin irritation, leading to redness or discomfort upon contact. It causes serious eye irritation, potentially resulting in redness, pain, and blurred vision. It Cause respiratory irritation, especially if inhaled as dust or vapor, which may lead to coughing, shortness of breath, or throat irritation.It may cause damage to organs through prolonged or repeated exposure, particularly affecting organs such as the liver or kidneys depending on the route and duration of exposure..The exposure must be kept as minimum as possible by the use of appropriate risk management measures 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 potentialhazardous levels of chemicals.Industrial workers should ensure that they follow the advice found in the extended safety data sheet (SDS).

Environment:

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
	Skin and body protection:	Wear suitable protective clothing
	Respiratory protection:	[In case of inadequate ventilation] wear respiratory protection.
Engineering controls	Ensure good ventilation of the work station.	
Environment protective measures		
Avoid release to the environment		

9. First-aid measures

First-aid measures after inhalation : Remove the person to fresh air and keep them comfortable for breathing. Call a poison center or a doctor if you feel unwell.

First-aid measures after skin contact : Wash skin with plenty of water. Take off contaminated clothing. If skin irritation occurs: Get medical advice/attention.

First-aid measures after eye contact : Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.

First-aid measures after ingestion : Call a poison center or a doctor if you feel unwell.

Extinguishing media
Suitable extinguishing media : Water spray. Dry powder. Foam.

Unsuitable extinguishing media :Do not use a heavy water stream.

Special hazards arising from the substance or mixture

Hazardous decomposition products in case of fire : Toxic fumes may be release

Precautionary measures fire : Exposure to fire/heat: keep upwind. Exposure to fire/heat: consider evacuation. Exposure to fire/heat: seal off low-lying areas. Exposure to fire/heat: have neighbourhood close doors and windows.

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

11. Accidental release measures

Protective equipment : safety goggles. protective gloves.Wear self-contained breathing apparatus and special tightly sealed suit.

Environmental precautions : Avoid release to the environment.

For containment : Collect spillage.

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 : Disposal must be done according to official regulations.

13. Handling and storage

Precautions for safe handling : Do not breathe dust/fume/gas/mist/vapors/spray. Use only outdoors or in a well-ventilated area.Avoid contact with skin and eyes.Wear personal protective equipment.

Hygiene measures : Wash contaminated clothing before reuse. Do not eat, drink or smoke when using this product. Always wash hands after handling the product.

14. Classification and Labeling

Hazard pictograms (GHS US) :

Signal word (GHS US) : Warning

Hazard statements (GHS US) : H315 - Causes skin irritation
H319 - Causes serious eye irritation
H335 - May cause respiratory irritation

Precautionary statements (GHS US)	:	H373 - May cause damage to organs through prolonged or repeated exposure H411 - Toxic to aquatic life with long lasting effects P260 - Do not breathe dust, fume, gas, mist, vapours, spray. P264 - Wash hands, forearms and face thoroughly after handling. P271 - Use only outdoors or in a well-ventilated area. P273 - Avoid release to the environment. P280 - Wear protective gloves. P302+P352 - If on skin: Wash with plenty of water. P304+P340 - If inhaled: Remove person to fresh air and keep comfortable for breathing. P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P312 - Call a poison center or doctor if you feel unwell. P314 - Get medical advice or attention if you feel unwell. P321 - Specific treatment (see supplemental first aid instruction on this label). P332+P313 - If skin irritation occurs: Get medical advice or attention. P337+P313 - If eye irritation persists: Get medical advice or attention. P362+P364 - Take off contaminated clothing and wash it before reuse. P391 - Collect spillage. P403+P233 - Store in a well-ventilated place. Keep container tightly closed. P405 - Store locked up. P501 - Dispose of contents and/or container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulations.

15. Conclusion

4-Chloro-2-nitrotoluene is a yellow to orange crystalline solid widely used as an intermediate in the synthesis of indigo dye, pharmaceutical agents such as NMDA-glycine antagonists, COX-2 inhibitors, and other bioactive compounds. Despite its utility in industrial and pharmaceutical chemistry, it presents significant health, environmental, and physical hazards.From a health and safety perspective, it is classified as an irritant, capable of causing skin, eye, and respiratory tract irritation. Chronic or repeated exposure may lead to organ damage, particularly affecting the liver or kidneys. Although acute toxicity data is limited, the substance must be treated as potentially hazardous, requiring strict control measures to limit exposure through inhalation, ingestion, or dermal contact.Environmental precautions are also critical. The compound is not readily biodegradable and may pose risks to aquatic ecosystems. Therefore, unintentional releases into water systems must be prevented, and proper waste management procedures should be followed.

16. Contact Information within company

Manufacturer
Aarti Industries Limited
Udyog Kshetra, 2nd Floor, Mulund Goregaon Link Road, Mulund (West)
400080 Mumbai - India
T +91-22-6797-6666 - F +91-22-2565 3234
info@aarti-industries.com - www.aarti-industries.com