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Material Safety Data Sheet

2,4-Dinitrotoluene

Section 1: Chemical Product and Company Identification

Product Name: 2,4-Dinitrotoluene
CAS#: 121-14-2
Synonym: 1-Methyl-2,4-dinitrobenzene; 2,4-Dinitrotoluol; 2,4-DNT; 4-Methyl-1,3-dintrobenzene; Benzene, 1-methyl-2,4-dinitro-; Dinitrotoluene; DNT
Chemical Formula: C7-H6-N2-O4
Contact Information for Emergency: (0086) 551 65418695

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Section 2: Composition and Information on Ingredients

Composition:

Name	CAS # %	By Weight
2,4-Dinitrotoluene	121-14-2	99%

Section 3: Hazards Identification

Potential Acute Health Effects: Hazardous in case of ingestion, of inhalation. Slightly hazardous in case of skin contact (irritant, permeator), of eye contact (irritant).
Potential Chronic Health Effects: CARCINOGENIC EFFECTS: Classified 2B (Possible for human.) by IARC. MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells. Mutagenic for bacteria and/or yeast. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to blood, kidneys, liver, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation occurs.
Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.
Serious Skin Contact: Not available.
Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.
Serious Inhalation: Not available.
Ingestion: Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.
Serious Ingestion: Not available.

Section 5: Fire Fighting Measures

Flammability of the Product: May be combustible at high temperature.
Auto-Ignition Temperature: 420°C (788°F)
Flash Points: CLOSED CUP: 206.67°C (404°F).
Flammable Limits: Not available.
Products of Combustion: These products are carbon oxides (CO, CO2), nitrogen oxides (NO, NO2...).
Fire Hazards in Presence of Various Substances: Slightly flammable to flammable in presence of heat.
Explosion Hazards in Presence of Various Substances: Risks of explosion of the product in presence of static discharge: Not available. Slightly explosive in presence of shocks, of heat.
Fire Fighting Media and Instructions: SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. Do not use water jet.
Special Remarks on Fire Hazards: Not available.
Special Remarks on Explosion Hazards: Explosive if confined and heated. Closed containers may rupture violently when heated. It may be shock sensitive. Impact sensitivity (minimum fall of a 2 kg. weight from a height of over 100 cm to cause at least 1 explosion in ten trials). This data came from the Hazardous Substance Data Bank.

Section 6: Accidental Release Measures

Small Spill: Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.
Large Spill: Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system.

Section 7: Handling and Storage

Precautions: Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe dust. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents, reducing agents, metals, alkalis.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8: Exposure Controls/Personal Protection

Engineering Controls: Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection: Safety glasses. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill: Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits: TWA: 1.5 (mg/m3) from OSHA (PEL) [United States] SKIN TWA: 1.5 (mg/m3) from NIOSH [United States] SKIN TWA: 0.2 (mg/m3) from ACGIH (TLV) [United States] SKINConsult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid. (Crystals solid.)
Odor: Slight.
Taste: Not available.
Molecular Weight: 182.14 g/mole
Color: Yellow. Yellow to red.
pH (1% soln/water): Not applicable.
Boiling Point: 300°C (572°F)
Melting Point: 71°C (159.8°F)
Decomposition Temperature: 250 deg. C. Decomposition is sustaining at 280 deg. C
Critical Temperature: Not available.
Specific Gravity: 1.3208 (Water = 1)
Vapor Pressure: Not applicable.
Vapor Density: 6.27 (Air = 1)
Volatility: Not available.
Odor Threshold: Not available.
Water/Oil Dist. Coeff.: The product is more soluble in oil; log(oil/water) = 2
Ionicity (in Water): Not available.
Dispersion Properties: See solubility in water, diethyl ether, acetone

Section 10: Stability and Reactivity Data

Stability: The product is stable.
Instability Temperature: Not available.
Conditions of Instability: Excess heat, incompatible materials, dust generation
Incompatibility with various substances: Reactive with oxidizing agents.
Corrosivity: Not available. **Special Remarks on Reactivity:** Not available.

Special Remarks on Corrosivity: Not available.
Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Inhalation. Ingestion.
Toxicity to Animals: Acute oral toxicity (LD50): 268 mg/kg [Rat]. Acute dermal toxicity (LD50): >1000 mg/kg [Guinea pig].
Chronic Effects on Humans: CARCINOGENIC EFFECTS: Classified 2B (Possible for human.) by IARC. MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells. Mutagenic for bacteria and/or yeast. May cause damage to the following organs: blood, kidneys, liver, central nervous system (CNS).
Other Toxic Effects on Humans: Hazardous in case of ingestion, of inhalation. Slightly hazardous in case of skin contact (irritant, permeator).
Special Remarks on Toxicity to Animals: Not available.
Special Remarks on Chronic Effects on Humans: May affect genetic material (mutagenic). May cause cancer. May cause adverse reproductive effects based on animal test data (Rats - pre-implantation mortality/reduced number of inplants per female; effects on spermatogenesis in males). No human data found.
Special Remarks on other Toxic Effects on Humans: Acute Potential Health Effects: Skin: Causes skin irritation. Draize tests on rabbit skin showed mild skin irritation 24 hrs after application of a 500 mg. It can be absorbed by the skin. Absorption through the skin may cause a chemical change of the blood oxyhemoglobin to methemoglobin resulting in Methemoglobinemia. May form methemoblobin in sufficient concentration to cause cyanosis. Cyanosis occurs when methemoglobion of the blood is 15% or more. The symptoms observed include blueness of the lips, the nose, and the earlobes. The individual usually feels well, has no complaints until the methemoglobin concentration approaches 40%, when there usually is weakness and dizziness; at levels of 70% methemoglobin, there may be ataxia and other central nervous system effects (see ingestion), dyspnea on mild exertion, tachycardia, nausea, vomiting and drowsiness, and other symptoms similar to that of acute ingestion. Eyes: May cause eye irritation Inhalation: Causes respiratory tract irritation. Inhalation of the 2,4-DNT dust may also cause Methemoglobinemia with similar symptoms to those of skin absorption and ingestion. Ingestion: Harmful if swallowed. Causes gastrointestinal irritation with nausea, vomiting, anorexia. Absorption from the gastrointestinal tract can also cause Methemoglobinemia. Symptoms due to formation of methemoglobin in the blood can include: Cyanosis, chocolate-brown blood, central nervous system effects such as vertigo, headache, fatigue, dizziness, weakness, nausea, vomiting, dyspnea, arthralgia, insomnia, tremor, paralysis, unconsciousness, respiratory symptoms such as chest pain, shortness of breath, heart palpitations, tachycardia. Chronic Potential Health Effects: Prolonged or repeated exposure via skin contact/absorption, inhalation and ingestion may affect the liver, kidneys as well as the blood(formation of methemoglobin, anemia, changes in blood serum composition), behavior/central nervous system. It may also cause weight loss.

Section 12: Ecological Information

Ecotoxicity: Ecotoxicity in water (LC50): 31 mg/l 96 hours [Fish (Pimephales promelas (fathead minnow))].
BOD5 and COD: Not available. **Products of Biodegradation:** Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.
Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.
Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Dispose of in compliance with all Federal, state and local laws and regulations.

Section 14: Transport Information

DOT Classification: Not a DOT controlled material (United States).
Identification: Not applicable.
Special Provisions for Transport: RQ: 10 lbs./4.53 kg

Section 15: Other Regulatory Information

Federal and State Regulations: California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: 2,4-Dinitrotoluene California prop. 65: This product contains the following ingredients for which the State of California has found to cause reproductive harm (male) which would require a warning under the statute: 2,4-Dinitrotoluene California prop. 65 (no significant risk level): 2,4- Dinitrotoluene: 0.002 mg/day (value) California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: 2,4-Dinitrotoluene Connecticut hazardous material survey.: 2,4-Dinitrotoluene Illinois chemical safety act: 2,4-Dinitrotoluene New York release reporting list: 2,4-Dinitrotoluene Rhode Island RTK hazardous substances: 2,4-Dinitrotoluene Pennsylvania RTK: 2,4-Dinitrotoluene Massachusetts RTK: 2,4-Dinitrotoluene Massachusetts spill list: 2,4-Dinitrotoluene New Jersey: 2,4-Dinitrotoluene New Jersey spill list: 2,4-Dinitrotoluene Louisiana spill reporting: 2,4-Dinitrotoluene California Director's List of Hazardous Substances: 2,4- Dinitrotoluene TSCA 8(b) inventory: 2,4-Dinitrotoluene TSCA 8(a) PAIR: 2,4-Dinitrotoluene TSCA 8(d) H and S data reporting: 2,4-Dinitrotoluene: Effective Date: 3/11/94; Sunset Date: 6/30/98 SARA 313 toxic chemical notification and release reporting: 2,4-Dinitrotoluene CERCLA: Hazardous substances.: 2,4-Dinitrotoluene: 10 lbs. (4.536 kg)

Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada): CLASS D-1A: Material causing immediate and serious toxic effects (VERY TOXIC). CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

DSCL (EEC): R45- May cause cancer. R48/22- Harmful: danger of serious damage to health by prolonged exposure if swallowed. R51/53- Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. R62- Possible risk of impaired fertility. R23/24/25- Toxic by inhalation, in contact with skin and if swallowed. S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). S53- Avoid exposure - obtain special instructions before use. S61- Avoid release to the environment. Refer to special instructions/Safety data sheets.

HMIS (U.S.A.):

Health Hazard: 2
Fire Hazard: 1
Reactivity: 3
Personal Protection: E

National Fire Protection Association (U.S.A.):
Health: 3
Flammability: 1
Reactivity: 3

Specific hazard: Protective Equipment: Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Safety glasses.

Section 16: Other Information

References: Not available.
Other Special Considerations: Not available.
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