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ISO 9001: 2015

MATERIAL SAFETY DATA SHEET

1. Identification

1.1 GHS Product identifier
2,4-Dinitroaniline, 98%
Code D 2155

2. Hazard identification

2.1 Classification of the substance or mixture
Acute toxicity - Oral, Category 2
Acute toxicity - Dermal, Category 1
Acute toxicity - Inhalation, Category 2
Specific target organ toxicity (repeated exposure), Category 2
Hazardous to the aquatic environment, long-term (Chronic) - Category Chronic 2
2.2 GHS label elements, including precautionary statements
Pictogram(s)



Signal word

Danger

Hazard statement(s)

H300 Fatal if swallowed
H310 Fatal in contact with skin
H330 Fatal if inhaled
H373 May cause damage to organs through prolonged or repeated exposure
H411 Toxic to aquatic life with long lasting effects

Precautionary statement(s)

Prevention

P264 Wash ... thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P262 Do not get in eyes, on skin, or on clothing.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P260 Do not breathe dust/fume/gas/mist/vapours/spray.
P271 Use only outdoors or in a well-ventilated area.
P284 [In case of inadequate ventilation] wear respiratory protection.
P273 Avoid release to the environment.
P301+P310 IF SWALLOWED: Immediately call a POISON CENTER/doctor/
P321 Specific treatment (see ... on this label).
P330 Rinse mouth.
P302+P352 IF ON SKIN: Wash with plenty of water/
P310 Immediately call a POISON CENTER/doctor/
P361+P364 Take off immediately all contaminated clothing and wash it before reuse.
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P320 Specific treatment is urgent (see ... on this label).
P314 Get medical advice/attention if you feel unwell.
P391 Collect spillage.

Response

Storage

P405 Store locked up.
P403+P233 Store in a well-ventilated place. Keep container tightly closed.

Disposal

P501 Dispose of contents/container to ...

2.3 Other hazards which do not result in classification
none

3. Composition/information on ingredients

3.1 Substances

Chemical name	Common names and synonyms	CAS number	EC number	Concentration
2,4-dinitroaniline	2,4-dinitroaniline	97-02-9	none	100%

4. First-aid measures

4.1 Description of necessary first-aid measures

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance.

If inhaled

Fresh air, rest. Refer for medical attention.

In case of skin contact

Remove contaminated clothes. Rinse skin with plenty of water or shower. Refer for medical attention.

In case of eye contact

First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.

If swallowed

Rinse mouth. Give one or two glasses of water to drink. Induce vomiting (ONLY IN CONSCIOUS PERSONS!). Refer for medical attention.

4.2 Most important symptoms/effects, acute and delayed

May cause headache, nausea, stupor. Irritating to skin and mucous membrane. (USCG, 1999)

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

Absorption, Distribution and Excretion

The disposition of 2,4-dinitroaniline was studied in rats. Male Fisher 344 rats were administered 0 to 90.0 $\mu\text{mol/kg}$ (^{14}C) labeled 2,4-dinitroaniline orally or 10.0 $\mu\text{mol/kg}$ intravenously. Urine, feces, and bile samples from cannulated rats were analyzed for (^{14}C) activity up to 3 days after pretreatment. Selected rats were killed between 15 minutes and 3 days after dosing and the tissue distribution of 2,4-dinitroaniline was determined. Urine and bile samples were analyzed for metabolites. 2,4-Dinitroaniline was rapidly distributed to all major tissues. Muscle, skin, and adipose tissue contained 65 to 70% of the (^{14}C) activity in the body during the 45 minutes after dosing. Clearance from all tissues was rapid, approximately 70 to 85% of the doses being cleared from most tissues within 6 hours after administration. Three days after administration the major tissues contained very low concentrations of (^{14}C) and variations with dose and route of administration were minimal. Urinary excretion of (^{14}C) activity accounted for 30% of the doses after 6 hours and 63% after 24 hours. Fecal excretion over 3 days accounted for 23% of the dose. Elimination of 2,4-dinitroaniline derived (^{14}C) activity in the bile amounted to 12.5% of the dose after 5 hours. Nine metabolites were detected. 2,4-Dinitrophenylhydroxylamine was the main metabolite. 2,4-Dinitrophenylhydroxylamine was excreted in the urine as the sulfate conjugate and in bile as the glucuronide. It was concluded that 2,4-dinitroaniline appears to have little potential for bioaccumulation in animal tissues. Amine hydroxylation and sulfation of 2,4-dinitroaniline are probable detoxification processes that occur rapidly and facilitate clearance.

5. Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media

WATER, CARBON DIOXIDE, DRY CHEMICAL

5.2 Specific hazards arising from the chemical

Special Hazards of Combustion Products: Vapors and combustion gases are irritating Behavior in Fire: May explode (USCG, 1999)

5.3 Special protective actions for fire-fighters

Wear self-contained breathing apparatus for firefighting if necessary.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation.

Evacuate personnel to safe areas. Avoid breathing dust. For personal protection see section 8.

6.2 Environmental precautions

Personal protection: particulate filter respirator adapted to the airborne concentration of the substance. Do NOT let this chemical enter the environment. Sweep spilled substance into covered containers. If appropriate, moisten first to prevent dusting. Carefully collect remainder. Then store and dispose of according to local regulations.

6.3 Methods and materials for containment and cleaning up

Pick up and arrange disposal. Sweep up and shovel. Keep in suitable, closed containers for disposal.

7. Handling and storage

7.1 Precautions for safe handling

Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Avoid exposure - obtain special instructions before use. Provide appropriate exhaust ventilation at places where dust is formed. For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Separated from strong oxidants and food and feedstuffs. Well closed. Store in a cool, dry, well ventilated location. Separate from acids and oxidizing materials. Detached storage must be used.

8. Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure limit values

no data available

Biological limit values

no data available

8.2 Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

8.3 Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection

Safety glasses with side-shields conforming to EN166. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166 (EU).

Skin protection

Wear impervious clothing. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace. 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. The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Respiratory protection

Wear dust mask when handling large quantities.

Thermal hazards

no data available

9. Physical and chemical properties

Physical state	Yellow needles or greenish-yellow plates, musty odor.
Colour	YELLOW NEEDLES FROM DIL ACETONE, GREENISH-YELLOW PLATES FROM ALCOHOL.
Odour	Musty odor
Melting point/ freezing point	177-180 °C
Boiling point or initial boiling point and boiling range	400.6 °C at 760 mmHg
Flammability	Combustible. Gives off irritating or toxic fumes (or gases) in a fire.
Lower and upper explosion limit / flammability limit	no data available
Flash point	224 °C
Auto-ignition temperature	no data available
Decomposition temperature	no data available
pH	no data available
Kinematic viscosity	no data available
Solubility	In water: 0.06 g/L (20 °C)
Partition coefficient n-octanol/water (log value)	log Kow= 1.84 (est)
Vapour pressure	5.94 X 10 ⁻⁷ mm Hg at 25 °C (est)
Density and/or relative density	1.615
Relative vapour density	6.31 (Relative to Air)
Particle characteristics	no data available

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

SLIGHT, WHEN EXPOSED TO HEAT OR FLAME. 2,4-DINITROANILINE may decompose violently at elevated temperatures. This compound can react with oxidizing materials, i.e. chlorine/hydrochloric acid. . In mixture with powdered charcoal ignited upon heating, [Cahiers, 1980, (99), 278].

10.4 Conditions to avoid

no data available

10.5 Incompatible materials

DISASTER HAZARD: ... IT CAN REACT WITH OXIDIZING MATERIALS.

10.6 Hazardous decomposition products

WHEN HEATED TO DECOMP, IT EMITS HIGHLY TOXIC FUMES.

11. Toxicological information

Acute toxicity

Oral: no data available

Inhalation: no data available

Dermal: no data available

Skin corrosion/irritation

no data available

Serious eye damage/irritation

no data available

Respiratory or skin sensitization

no data available

Germ cell mutagenicity

no data available

Carcinogenicity
no data available
Reproductive toxicity
no data available
STOT-single exposure
no data available
STOT-repeated exposure
no data available
Aspiration hazard
no data available

12. Ecological information

12.1 Toxicity

Toxicity to fish: LC50 Pimephales promelas (fathead minnow) 14.2 mg/l/96 hr (Confidence limit 13.5 to 15.0 mg/l). Affected fish lost schooling behavior and swam near the tank surface with half being hyperactive and half hypoactive. They had increased respiration and hemorrhaging, were darkly colored, and lost equilibrium prior to death.

Toxicity to daphnia and other aquatic invertebrates: no data available

Toxicity to algae: no data available

Toxicity to microorganisms: no data available

12.2 Persistence and degradability

2,4-Dinitroaniline at an initial concn of 100 ppm showed no biodegradation in river and sea water after 3 days using a cultivation test method(1).

12.3 Bioaccumulative potential

Based on an estimated log Kow of 1.84(2), the bioconcentration factor (BCF) for 2,4-dinitroaniline can be estimated to be about 15 from a recommended regression-derived equation(1, SRC). This BCF value suggests that bioconcentration in aquatic organisms may not be significant(SRC).

12.4 Mobility in soil

Aromatic amines have been observed to undergo rapid and reversible covalent bonding with humic materials in aqueous solution; the initial bonding reaction is followed by a slower and much less reversible reaction believed to represent the addition of the amine to quinoidal structures followed by oxidation of the product to give an amino-substituted quinone; these processes represent pathways by which aromatic amines may be converted to latent forms in the biosphere(3). In the absence of covalent bonding, a Koc of approximately 240 can be estimated for 2,4-dinitroaniline based on an estimated log Kow of 1.84(2) and a recommended regression-derived equation(1, SRC); this Koc value suggests medium soil mobility(4).

12.5 Other adverse effects

no data available

13. Disposal considerations

13.1 Disposal methods

Product

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

Contaminated packaging

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

14. Transport information

14.1 UN Number

ADR/RID: UN1596

IMDG: UN1596

IATA: UN1596

14.2 UN Proper Shipping Name

ADR/RID: DINITROANILINES

IMDG: DINITROANILINES

IATA: DINITROANILINES

14.3 Transport hazard class(es)

ADR/RID: 6.1

IMDG: 6.1

IATA: 6.1

14.4 Packing group, if applicable

ADR/RID: II

IMDG: II

IATA: II

14.5 Environmental hazards

ADR/RID: yes

IMDG: yes

IATA: yes

14.6 Special precautions for user

no data available

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

no data available

15. Regulatory information

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

Chemical name	Common names and synonyms	CAS number	EC number
2,4-dinitroaniline	2,4-dinitroaniline	97-02-9	none
European Inventory of Existing Commercial Chemical Substances (EINECS)			Listed.
EC Inventory			Listed.

United States Toxic Substances Control Act (TSCA) Inventory	Listed.
China Catalog of Hazardous chemicals 2015	Listed.
New Zealand Inventory of Chemicals (NZIoC)	Listed.
Philippines Inventory of Chemicals and Chemical Substances (PICCS)	Listed.
Vietnam National Chemical Inventory	Not Listed.
Chinese Chemical Inventory of Existing Chemical Substances (China IECSC)	Listed.

Section 16: Other Information

This safety data sheet should be used in conjunction with technical sheets. It does not replace them. The information given is based on our knowledge of this product, at the time of publication. It is given in good faith. The attention of the user is drawn to the possible risks incurred by using the product for any other purpose other than that for which it was intended. This does not in any way excuse the user from knowing and applying all the regulations governing his activity. It is the sole responsibility of the user to take all precautions required in handling the product. The aim of the mandatory regulations mentioned is to help the user to fulfill his obligations regarding the use of hazardous products.

