4-NITROANILINE (RING-D4, 96%)

Safety Data Sheet

according to Regulation (EC) No. 453/2010 and according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Date of issue: 22/04/2011 Revision date: 18/11/2016 Supersedes: 22/04/2011 Version: 2.0

DLM-662

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product form	:	Substance
Substance name	:	4-NITROANILINE (RING-D4, 96%)
EC index no	:	612-012-00-9 (Unlabeled)
EC no	:	202-810-1 (Unlabeled)
CAS No	:	100-01-6 (Unlabeled)
Product code	:	DLM-662
Formula	:	C6D4H2N2O2

1.2. Relevant identified uses of the substance or mixture and uses advised against

1.2.1. Relevant identified uses

Main use category	:	Professional use
Industrial/Professional use spec	:	For professional use only

1.2.2. Uses advised against

No additional information available

1.3. Details of the supplier of the safety data sheet

Cambridge Isotope Laboratories, Inc.
50 Frontage Road
Andover, MA 01810
USA

USA: 1-800-322-1174 Int: 1-978-749-8000
cilsales@isotope.com www.isotope.com

Emergency telephone number

Emergency numbers:

Chemtrec: 1-800-424-9300 (24 hours)
International: 1-703-741-5970 (24 hours)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Acute Tox. 3 (Oral)	H301
Acute Tox. 3 (Dermal)	H311
Acute Tox. 3 (Inhalation:dust,mist)	H331
STOT RE 2	H373
Aquatic Chronic 3	H412

Full text of H-statements: see section 16

Classification according to Directive 67/548/EEC [DSD] or 1999/45/EC [DPD]

T; R23/24/25
T; R48/23/24/25
R52/53

Full text of R-phrases: see section 16

GHS-US classification

Acute Tox. 3 (Oral)	H301
Acute Tox. 3 (Dermal)	H311
Acute Tox. 3 (Inhalation)	H331
STOT RE 2	H373
Aquatic Acute 3	H402
Aquatic Chronic 3	H412

Adverse physicochemical, human health and environmental effects

No additional information available

2.2. Label elements

Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP) :

GHS06

Signal word (CLP) : Danger

Hazard statements (CLP) : H301+H311+H331 - Toxic if swallowed, in contact with skin or if inhaled
H373 - May cause damage to organs (eyes, liver, Skin) through prolonged or repeated exposure (if inhaled, in contact with skin, if swallowed)
H412 - Harmful to aquatic life with long lasting effects

Precautionary statements (CLP) : P260 - Do not breathe dust, fume, gas, mist, spray, vapours
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 clothing, protective gloves
P301+P310 - IF SWALLOWED: Immediately call a doctor, a POISON CENTER
P302+P352 - IF ON SKIN: Wash with plenty of water

GHS-US labelling

Hazard pictograms (GHS-US) :

GHS06

Signal word (GHS-US) : Danger

Hazard statements (GHS-US) : H301+H311+H331 - Toxic if swallowed, in contact with skin or if inhaled
H373 - May cause damage to organs (eyes, liver, Skin) through prolonged or repeated exposure (Dermal, Inhalation, oral)
H412 - Harmful to aquatic life with long lasting effects

Precautionary statements (GHS-US) : P260 - Do not breathe dust, fume, mist, gas, spray, vapours
P261 - Avoid breathing dust, fume, gas, mist, spray, vapours
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 clothing, protective gloves
P301+P310 - IF SWALLOWED: immediately call a POISON CENTER or doctor/physician
P302+P352 - IF ON SKIN: Wash with plenty of soap and water
P304+P340 - IF INHALED: remove victim to fresh air and keep at rest in a position comfortable for breathing
P311 - Call a POISON CENTER or doctor/physician
P312 - Call a POISON CENTER or doctor/physician if you feel unwell
P314 - Get medical advice and attention if you feel unwell
P321 - Specific treatment (see Hazard pictograms (CLP) on this label)
P330 - If swallowed, rinse mouth
P361 - Remove/Take off immediately all contaminated clothing
P363 - Wash contaminated clothing before reuse
P403+P233 - Store in a well-ventilated place. Keep container tightly closed
P405 - Store locked up
P501 - Dispose of contents/container to Comply with applicable regulations

2.3. Other hazards

No additional information available

SECTION 3: Composition/information on ingredients

3.1. Substance

Name	Product identifier	%	Classification according to Directive 67/548/EEC
4-NITROANILINE (RING-D4, 96%) (Main constituent)	(CAS No) 100-01-6 (Unlabeled) (EC no) 202-810-1 (Unlabeled) (EC index no) 612-012-00-9 (Unlabeled)	100	T; R23/24/25 T; R48/23/24/25 R52/53

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Full text of R- and H-statements: see section 16

Name	Product identifier	%	GHS-US classification
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Full text of H-statements: see section 16

3.2. Mixture

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general : Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

First-aid measures after inhalation : If breathed in, move person to fresh air. If not breathing, give artificial respiration. Consult a physician.

First-aid measures after skin contact : Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

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

First-aid measures after ingestion : Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries after inhalation : Toxic if inhaled. May cause respiratory tract irritation.

Symptoms/injuries after skin contact : Toxic if absorbed through skin. May cause skin irritation.

Symptoms/injuries after eye contact : May cause eye irritation.

Symptoms/injuries after ingestion : Toxic if swallowed.

4.3. Indication of any immediate medical attention and special treatment needed

No additional information available

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Use water spray, alcohol-resistant foam, dry chemical, or carbon dioxide.

5.2. Special hazards arising from the substance or mixture

Reactivity : Not available.

5.3. Advice for firefighters

Firefighting instructions : Wear self contained breathing apparatus for fire fighting if necessary.

Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

Emergency procedures : Wear respiratory protection. Avoid dust formation. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.

6.1.2. For emergency responders

No additional information available

6.2. Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3. Methods and material for containment and cleaning up

For containment : Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4. Reference to other sections

No additional information available

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Provide appropriate exhaust ventilation at places where dust is formed. Normal measures for preventive fire protection. Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.

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

7.2. Conditions for safe storage, including any incompatibilities

Technical measures : Keep container tightly closed in a dry and well-ventilated place.

Storage conditions : Store at room temperature away from light and moisture.

7.3. Specific end use(s)

No additional information available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

4-NITROANILINE (RING-D4, 96%) (100-01-6 (Unlabeled))		
Italy - Portugal - USA ACGIH	ACGIH TWA (mg/m³)	3 mg/m³ Remarks: Eye irritation. Liver damage. Methemoglobinemia. Substances for which there is a Biological Exposure Index or Indices (see BEI section), se BEI for Methomoglobin Inducers. Not classifiable as a human carcinogen. Danger of cutaneous absorption. USA. ACGIH Threshold Limit Values (TLV)
USA NIOSH	NIOSH REL (TWA) (mg/m³)	3 mg/m³ Remarks: Potential for dermal absorption. USA. NIOSH Recommended Exposure Limits.
USA OSHA	OSHA PEL (TWA) (mg/m³)	6 mg/m³ Remarks: Skin designation. The value in mg/m3 is approximate. USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants.
USA OSHA	OSHA PEL (TWA) (ppm)	1 ppm Remarks: Skin designation. USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants.
USA OSHA	OSHA PEL (Ceiling) (mg/m³)	3 mg/m³ Remarks: Skin. California permissible exposure limits for chemical contaminants (Title 8, Article 107)

8.2. Exposure controls

Appropriate engineering controls : Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product. Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment : Gloves. Protective clothing. Protective goggles. Self-contained breathing apparatus.

Materials for protective clothing : Wear suitable protective clothing and gloves.

Hand protection : Wear suitable protective clothing and gloves.

Eye protection : Wear safety glasses with side shields (or goggles) and a face shield.

Skin and body protection : Choose body protection according to the amount and concentration of the dangerous substance at the work place.

Respiratory protection : When appropriate, use NIOSH/CEN approved respirator.

Environmental exposure controls : Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	:	Solid
Appearance	:	Crystalline, Powder.
Molecular mass	:	142.15 g/mol (Labeled)
Colour	:	Yellow.
Odour	:	Ammoniacal.
Odour threshold	:	No data available
pH	:	7
Relative evaporation rate (butylacetate=1)	:	No data available
Melting point	:	146 - 149 °C (295 - 300 °F) - lit.
Freezing point	:	No data available
Boiling point	:	260 (500 °F) at 133 hPa (100 mmHg) - lit.
Flash point	:	213 °C (415.4 °F) - closed cup
Auto-ignition temperature	:	180 (356 °F)
Decomposition temperature	:	No data available
Flammability (solid, gas)	:	No data available
Vapour pressure	:	0.005 hPa (0.004 mmHg) at 25 °C (77 °F)
Relative vapour density at 20 °C	:	No data available
Relative density	:	No data available
Density	:	1.44 g/cm³ at 20 °C (68 °F)
Solubility	:	Water: - slighly soluble
Log Pow	:	1.39
Log Kow	:	No data available
Viscosity, kinematic	:	No data available
Viscosity, dynamic	:	No data available
Explosive properties	:	No data available
Oxidising properties	:	No data available
Explosive limits	:	No data available

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

Not available.

10.2. Chemical stability

Stable if stored under recommended conditions.

10.3. Possibility of hazardous reactions

No additional information available

10.4. Conditions to avoid

Not available.

10.5. Incompatible materials

Strong acids. Strong oxidizing agent. Strong reducing agents. Plastics. Rubber.

10.6. Hazardous decomposition products

Carbon oxides (CO, CO2). Nitrogen oxides.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Toxic if swallowed. Toxic in contact with skin. Toxic if inhaled.

4-NITROANILINE (RING-D4, 96%) (100-01-6 (Unlabeled))	
LD50 oral rat	750 mg/kg
LD50 dermal	> 500 mg/kg Guinea pig
ATE CLP (oral)	100.000 mg/kg bodyweight
ATE CLP (dermal)	300.000 mg/kg bodyweight
ATE CLP (dust,mist)	0.500 mg/l/4h

Skin corrosion/irritation	:	Not classified pH: 7
Serious eye damage/irritation	:	Not classified pH: 7
Respiratory or skin sensitisation	:	Not classified
Germ cell mutagenicity	:	Not classified
Carcinogenicity	:	Not classified
Reproductive toxicity	:	Overexposure may cause reproductive disorder(s) based on tests with laboratory animals.
Specific target organ toxicity (single exposure)	:	Not classified
Specific target organ toxicity (repeated exposure)	:	May cause damage to organs through prolonged or repeated exposure.
Aspiration hazard	:	Not classified
Potential adverse human health effects and symptoms	:	Absorption into the body leads to the formation of methemoglobin which in sufficient concentration causes cyanosis. Onset may be delayed 2 to 4 hours or longer. Exposure to and/or consumption of alcohol may increase toxic effects. Cough. Chest pain. Difficulty breathing. Drowsiness. Nausea. Cyanosis. Ataxia. Diarrhea. Vomiting. To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated. p-Nitroaniline is readily absorbed by inhalation, ingestion, or skin absorption. It is a strong methemoblobin former. Cyanosis is the first manifestation of toxicity.
Symptoms/injuries after inhalation	:	Toxic if inhaled. May cause respiratory tract irritation.
Symptoms/injuries after skin contact	:	Toxic if absorbed through skin. May cause skin irritation.
Symptoms/injuries after eye contact	:	May cause eye irritation.
Symptoms/injuries after ingestion	:	Toxic if swallowed.

SECTION 12: Ecological information

12.1. Toxicity

4-NITROANILINE (RING-D4, 96%) (100-01-6 (Unlabeled))	
LC50 fish 1	85.7 - 142 mg/l Pimephales promelas (fathead minnow) - 96 h
LC50 other aquatic organisms 1	87.6 mg/l Danio rerio (Zebra fish) - 96 h
EC50 Daphnia 1	17 mg/l Daphnia magna (Water flea) - 48 h
LC50 fish 2	35 mg/l Leuciscus idus (Golden orfe) - 48 h
ErC50 (algae)	68 mg/l No infomraiton available - 24 h

12.2. Persistence and degradability

No additional information available

12.3. Bioaccumulative potential

4-NITROANILINE (RING-D4, 96%) (100-01-6 (Unlabeled))	
BCF fish 1	0.028 mg/kg Danio rerio (Zebra fish) - 96 h
Bioconcentration factor (BCF REACH)	4.4
Log Pow	1.39

12.4. Mobility in soil

No additional information available

12.5. Results of PBT and vPvB assessment

No additional information available

12.6. Other adverse effects

Other adverse effects : An environmental hazard cannot be excluded in the event of an unprofessional handling or disposal. Harmful to aquatic life.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Regional legislation (waste)	:	Waste materials should be disposed of under conditions which meet Federal, State, and Local environmental control regulations.
Waste disposal recommendations	:	Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.
Ecology - waste materials	:	Dispose of as unused product.

SECTION 14: Transport information

In accordance with ADR / RID / IMDG / IATA / ADN

14.1. UN number

UN-No.(DOT)	:	1661
DOT NA no.		UN1661

14.2. UN proper shipping name

Proper Shipping Name (DOT)	:	Nitroanilines (o-, m-, p-)
Transport hazard class(es) (DOT)	:	6.1 - Class 6.1 - Poisonous materials 49 CFR 173.132
Hazard labels (DOT)	:	6.1 - Poison inhalation hazard

DOT Symbols	:	+ - Fixes (cannot be altered) proper shipping name, hazard class, and packing group
Packing group (DOT)	:	II - Medium Danger
DOT Special Provisions (49 CFR 172.102)	:	IB8 - Authorized IBCs: Metal (11A, 11B, 11N, 21A, 21B, 21N, 31A, 31B and 31N); Rigid plastics (11H1, 11H2, 21H1, 21H2, 31H1 and 31H2); Composite (11HZ1, 11HZ2, 21HZ1, 21HZ2, 31HZ1 and 31HZ2); Fiberboard (11G); Wooden (11C, 11D and 11F); Flexible (13H1, 13H2, 13H3, 13H4, 13H5, 13L1, 13L2, 13L3, 13L4, 13M1 or 13M2). IP2 - When IBCs other than metal or rigid plastics IBCs are used, they must be offered for transportation in a closed freight container or a closed transport vehicle. IP4 - Flexible, fiberboard or wooden IBCs must be sift-proof and water-resistant or be fitted with a sift-proof and water-resistant liner. T3 - 2.65 178.274(d)(2) Normal..... 178.275(d)(2) TP33 - The portable tank instruction assigned for this substance applies for granular and powdered solids and for solids which are filled and discharged at temperatures above their melting point which are cooled and transported as a solid mass. Solid substances transported or offered for transport above their melting point are authorized for transportation in portable tanks conforming to the provisions of portable tank instruction T4 for solid substances of packing group III or T7 for solid substances of packing group II, unless a tank with more stringent requirements for minimum shell thickness, maximum allowable working pressure, pressure-relief devices or bottom outlets are assigned in which case the more stringent tank instruction and special provisions shall apply. Filling limits must be in accordance with portable tank special provision TP3. Solids meeting the definition of an elevated temperature material must be transported in accordance with the applicable requirements of this subchapter.
DOT Packaging Exceptions (49 CFR 173.xxx)	:	153
DOT Packaging Non Bulk (49 CFR 173.xxx)	:	212
DOT Packaging Bulk (49 CFR 173.xxx)	:	242

14.3. Additional information

Other information	:	No supplementary information available.
Special transport precautions	:	Not dangerous goods.

Overland transport

Packing group (ADR)	:	II
Class (ADR)	:	6.1 - Toxic substances
Hazard identification number (Kemler No.)	:	60
Classification code (ADR)	:	T2
Danger labels (ADR)	:	6.1 - Toxic substances

Orange plates	:	60 1661
Tunnel restriction code	:	D/E
Limited quantities (ADR)		500g
EAC code	:	2X

Excepted quantities (ADR) : E4

Transport by sea

DOT Vessel Stowage Location : A - The material may be stowed ‘‘on deck’’ or ‘‘under deck’’ on a cargo vessel and on a passenger vessel.

MFAG-No : 153

Air transport

DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27) : 25 kg

DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75) : 100 kg

Civil Aeronautics Law : Toxic and infectious substances/Toxic substances(Hazardous materials notice Appended Table 1 Article 194 of the Enforcement Regulations)

14.4. Environmental hazards

Other information : No supplementary information available.

14.5. Special precautions for user

Special transport precautions : Not dangerous goods.

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

Not applicable

SECTION 15: Regulatory information

15.1. US Federal regulations

4-NITROANILINE (RING-D4, 96%) (100-01-6 (Unlabeled))	
Subject to reporting requirements of United States SARA Section 313	
SARA Section 302 Threshold Planning Quantity (TPQ)	Not subject to reporing requirements of the United States SARA Section 302.
SARA Section 311/312 Hazard Classes	Immediate (acute) health hazard

15.2. International regulations

CANADA

4-NITROANILINE (RING-D4, 96%) (100-01-6 (Unlabeled))
Listed on the Canadian DSL (Domestic Substances List)

15.2.1. National regulations

No additional information available

15.3. US State regulations

4-NITROANILINE (RING-D4, 96%)(100-01-6 (Unlabeled))	
State or local regulations	U.S. - Massachusetts - Right To Know List U.S. - Pennsylvania - RTK (Right to Know) List U.S. - New Jersey - Right to Know Hazardous Substance List This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

SECTION 16: Other information

Other information : This product is not radioactive. The data given for this product are those of the corresponding unlabeled compound, unless specifically indicated otherwise. Health and safety data for labeled compounds are generally not available, but are assumed to be similar or identical to the corresponding unlabeled compound.

Full text of R-, H- and EUH-statements:

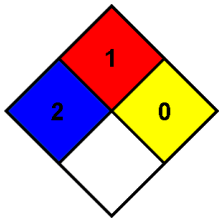
Acute Tox. 3 (Dermal)	Acute toxicity (dermal), Category 3

Acute Tox. 3 (Inhalation:dust,mist)	Acute toxicity (inhalation:dust,mist) Category 3
Acute Tox. 3 (Oral)	Acute toxicity (oral), Category 3
Aquatic Chronic 3	Hazardous to the aquatic environment — Chronic Hazard, Category 3
STOT RE 2	Specific target organ toxicity — Repeated exposure, Category 2
H301	Toxic if swallowed
H311	Toxic in contact with skin
H331	Toxic if inhaled
H373	May cause damage to organs through prolonged or repeated exposure
H412	Harmful to aquatic life with long lasting effects
R23/24/25	Toxic by inhalation, in contact with skin and if swallowed
R48/23/24/25	Toxic: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed
R52/53	Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment
T	Toxic

NFPA health hazard : 2 - Intense or continued exposure could cause temporary incapacitation or possible residual injury unless prompt medical attention is given.

NFPA fire hazard : 1 - Must be preheated before ignition can occur.

NFPA reactivity : 0 - Normally stable, even under fire exposure conditions, and are not reactive with water.



HMIS III Rating

Health : 2 Moderate Hazard - Temporary or minor injury may occur

Flammability : 1 Slight Hazard

Physical : 0 Minimal Hazard

CIL Multi-Solvent Mixture SDS

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product