1 Identification

· Product identifier
· Trade name: 4,4′-Methylenebis(2-chloroaniline)
· Part number: RCC-011
· CAS Number: 101-14-4
· EC number: 202-918-9
· Index number: 612-078-00-9
· Application of the substance / the mixture: Reagents and Standards for Analytical Chemical Laboratory Use

2 Hazard(s) identification

· Classification of the substance or mixture
  GHS08 Health hazard
  Carc. 1B H350 May cause cancer.

  GHS07
  Acute Tox. 4 H302 Harmful if swallowed.

· Label elements
  · GHS label elements: The substance is classified and labeled according to the Globally Harmonized System (GHS).
  · Hazard pictograms
    GHS07 GHS08

· Signal word: Danger
· Hazard-determining components of labeling:
  2,2′-dichloro-4,4′-methylenedianiline
· Hazard statements
  Harmful if swallowed.
  May cause cancer.
· Precautionary statements
  Obtain special instructions before use.

(Contd. on page 2)
Safety Data Sheet
acc. to OSHA HCS

Trade name: 4,4'-Methylenebis(2-chloroaniline)

Do not handle until all safety precautions have been read and understood.
Wash thoroughly after handling.
Do not eat, drink or smoke when using this product.
Wear protective gloves/protective clothing/eye protection/face protection.
If swallowed: Call a poison center/doctor if you feel unwell.
Rinse mouth.
IF exposed or concerned: Get medical advice/attention.
Store locked up.
Dispose of contents/container in accordance with local/regional/national/international regulations.

· Classification system:
  · NFPA ratings (scale 0 - 4)
    Health = 1
    Fire = 1
    Reactivity = 0
  · HMIS-ratings (scale 0 - 4)
    Health = *1
    Fire = 1
    Reactivity = 0

· Other hazards
  · Results of PBT and vPvB assessment
    · PBT: Not applicable.
    · vPvB: Not applicable.

3 Composition/information on ingredients

· Chemical characterization: Substances
  · CAS No. Description
    101-14-4 2,2'-dichloro-4,4'-methylenedianiline
  · Identification number(s)
    · EC number: 202-918-9
    · Index number: 612-078-00-9

4 First-aid measures

· Description of first aid measures
  · General information:
    Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.
  · After inhalation: Supply fresh air; consult doctor in case of complaints.
  · After skin contact: Generally the product does not irritate the skin.
  · After eye contact: Rinse opened eye for several minutes under running water.
  · After swallowing: Immediately call a doctor.
  · Information for doctor:
    · Most important symptoms and effects, both acute and delayed No further relevant information available.
5 Fire-fighting measures

- **Extinguishing media**
- Suitable extinguishing agents: Use fire fighting measures that suit the environment.
- Special hazards arising from the substance or mixture: No further relevant information available.
- Advice for firefighters
- Protective equipment: No special measures required.

6 Accidental release measures

- **Personal precautions, protective equipment and emergency procedures** Not required.
- Environmental precautions: Do not allow to enter sewers/surface or ground water.
- Methods and material for containment and cleaning up:
  - Dispose contaminated material as waste according to item 13.
  - Ensure adequate ventilation.
- Reference to other sections
  - See Section 7 for information on safe handling.
  - See Section 8 for information on personal protection equipment.
  - See Section 13 for disposal information.
- **Protective Action Criteria for Chemicals**

<table>
<thead>
<tr>
<th>PAC</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAC-1</td>
<td>0.03 ppm</td>
</tr>
<tr>
<td>PAC-2</td>
<td>0.94 ppm</td>
</tr>
<tr>
<td>PAC-3</td>
<td>21 ppm</td>
</tr>
</tbody>
</table>

7 Handling and storage

- Handling:
- Precautions for safe handling
  - Ensure good ventilation/exhaustion at the workplace.
  - Open and handle receptacle with care.
- Information about protection against explosions and fires: Keep respiratory protective device available.
- Conditions for safe storage, including any incompatibilities
- Storage:
  - Requirements to be met by storerooms and receptacles: No special requirements.
  - Information about storage in one common storage facility: Not required.
  - Further information about storage conditions: Keep receptacle tightly sealed.
- Specific end use(s) No further relevant information available.
8 Exposure controls/personal protection

· Additional information about design of technical systems: No further data; see item 7.

· Control parameters

· Components with limit values that require monitoring at the workplace:
The following constituent is the only constituent of the product which has a PEL, TLV or other recommended exposure limit.
The following constituents are the only constituents of the product which have a PEL, TLV or other recommended exposure limit.
At this time, the remaining constituent has no known exposure limits.
At this time, the other constituents have no known exposure limits.

<table>
<thead>
<tr>
<th>101-14-4 2,2'-dichloro-4,4'-methylenedianiline</th>
</tr>
</thead>
<tbody>
<tr>
<td>REL</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>TLV</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

· Ingredients with biological limit values:

<table>
<thead>
<tr>
<th>101-14-4 2,2'-dichloro-4,4'-methylenedianiline</th>
</tr>
</thead>
<tbody>
<tr>
<td>BEI</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

· Additional information: The lists that were valid during the creation were used as basis.

· Exposure controls

· Personal protective equipment:

· General protective and hygienic measures:
Keep away from foodstuffs, beverages and feed.
Wash hands before breaks and at the end of work.
Store protective clothing separately.

· Breathing equipment:
When used as intended with Agilent instruments, the use of the product under normal laboratory conditions and with standard practices does not result in significant airborne exposures and therefore respiratory protection is not needed.
Under an emergency condition where a respirator is deemed necessary, use a NIOSH or equivalent approved device/equipment with appropriate organic or acid gas cartridge.

· Protection of hands:
Although not recommended for constant contact with the chemicals or for clean-up, nitrile gloves 11-13 mil thickness are recommended for normal use. The breakthrough time is 1 hr. For cleaning a spill where there is direct contact of the chemical, butyl rubber gloves are recommended 12-15 mil thickness with breakthrough times exceeding 4 hrs. Supplier recommendations should be followed.

· Material of gloves
For normal use: nitrile rubber, 11-13 mil thickness
For direct contact with the chemical: butyl rubber, 12-15 mil thickness
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.

· Penetration time of glove material
For normal use: nitrile rubber: 1 hour
For direct contact with the chemical: butyl rubber: >4 hours
**9 Physical and chemical properties**

- **Appearance:**
  - Form: Solid
  - Color: Not determined.
  - Odor: Characteristic
  - Odor threshold: Not determined.

- **pH-value:** Not applicable.

- **Change in condition**
  - Melting point/Melting range: 110 °C (230 °F)
  - Boiling point/Boiling range: Undetermined.

- **Flash point:** 113 °C (235.4 °F)

- **Flammability (solid, gaseous):** Product is not flammable.

- **Decomposition temperature:** Not determined.

- **Auto igniting:** Not determined.

- **Danger of explosion:** Product does not present an explosion hazard.

- **Explosion limits:**
  - Lower: Not determined.
  - Upper: Not determined.

- **Vapor pressure:** Not applicable.

- **Density at 20 °C (68 °F):** 1.44 g/cm³ (12.0168 lbs/gal)

- **Relative density:** Not determined.

- **Vapor density:** Not applicable.

- **Evaporation rate:** Not applicable.

- **Solubility in / Miscibility with Water:** Insoluble.

- **Partition coefficient (n-octanol/water):** Not determined.

- **Viscosity:**
  - Dynamic: Not applicable.
  - Kinematic: Not applicable.

- **VOC content:** 0.00 %
  - 0.0 g/l / 0.00 lb/gal

- **Solids content:** 100.0 %
10 Stability and reactivity

· **Reactivity** No further relevant information available.
· **Chemical stability**
  · **Thermal decomposition / conditions to be avoided**: No decomposition if used according to specifications.
  · **Possibility of hazardous reactions** No dangerous reactions known.
· **Conditions to avoid** No further relevant information available.
· **Incompatible materials**: No further relevant information available.
· **Hazardous decomposition products**: No dangerous decomposition products known.

11 Toxicological information

· **Information on toxicological effects**
· **Acute toxicity**:  
  · **LD/LC50 values that are relevant for classification:**
    
    | ATE (Acute Toxicity Estimate) |  
    |----------|----------|  
    | Oral     | LD50     | 2,000 mg/kg (rat) |
    | Dermal   | LD50     | >2,000 mg/kg (rat) |

    **101-14-4 2,2'-dichloro-4,4'-methylenedianiline**  
    | Oral     | LD50     | 2,000 mg/kg (rat) |
    | Dermal   | LD50     | >2,000 mg/kg (rat) |

· **Primary irritant effect:**  
  · **on the skin**: No irritant effect.
  · **on the eye**: No irritating effect.
· **Sensitization**: No sensitizing effects known.
· **Additional toxicological information:**
· **Carcinogenic categories**
  · **IARC (International Agency for Research on Cancer)** I  
  · **NTP (National Toxicology Program)** R  
  · **OSHA-Ca (Occupational Safety & Health Administration)** Substance is not listed.

12 Ecological information

· **Toxicity**
· **Aquatic toxicity**: No further relevant information available.
· **Persistence and degradability** No further relevant information available.
· **Behavior in environmental systems:**
· **Bioaccumulative potential** No further relevant information available.
· **Mobility in soil** No further relevant information available.
Trade name: 4,4'-Methylenebis(2-chloroaniline)

- Additional ecological information:
  - Water hazard class 2 (Self-assessment): hazardous for water
  - Do not allow product to reach ground water, water course or sewage system.
  - Danger to drinking water if even small quantities leak into the ground.

- Results of PBT and vPvB assessment
  - PBT: Not applicable.
  - vPvB: Not applicable.
- Other adverse effects: No further relevant information available.

13 Disposal considerations

- Waste treatment methods
  - Recommendation:
    - Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

- Uncleaned packagings:
  - Recommendation: Disposal must be made according to official regulations.

14 Transport information

- UN-Number
  - DOT, IMDG, IATA: UN3077

- UN proper shipping name
  - DOT: Environmentally hazardous substance, solid, n.o.s. (2,2’-dichloro-4,4’-methylenedianiline)
  - IMDG: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (2,2’-dichloro-4,4’-methylenedianiline), MARINE POLLUTANT
  - IATA: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (2,2’-dichloro-4,4’-methylenedianiline)

- Transport hazard class(es)
  - DOT, IMDG, IATA

- Class: 9 Miscellaneous dangerous substances and articles
- Label: 9

- Packing group
  - DOT, IMDG, IATA: III

- Environmental hazards:
  - Marine pollutant: Yes (DOT)
  - Symbol (fish and tree)

- Special marking (IATA):
  - Symbol (fish and tree)

- Special precautions for user
  - Warning: Miscellaneous dangerous substances and articles
Trade name: 4,4’-Methylenebis(2-chloroaniline)

- Danger code (Kemler): 90
- EMS Number: F-A,S-F
- Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code: Not applicable.

- Transport/Additional information:
  - DOT
  - Quantity limitations:
    - On passenger aircraft/rail: No limit
    - On cargo aircraft only: No limit
  - Hazardous substance: 10 lbs, 4.54 kg
  - Remarks: Special marking with the symbol (fish and tree).

- IMDG
  - Limited quantities (LQ): 5 kg
  - Excepted quantities (EQ): Code: E1
    - Maximum net quantity per inner packaging: 30 g
    - Maximum net quantity per outer packaging: 1000 g

- UN "Model Regulation":
  - UN 3077 ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (2,2'-DICHLORO-4,4’-METHYLENEDIANILINE), 9, III

15 Regulatory information

- Safety, health and environmental regulations/legislation specific for the substance or mixture
  - Sara
    - Section 355 (extremely hazardous substances): Substance is not listed.
    - Section 313 (Specific toxic chemical listings): Substance is listed.
    - TSCA (Toxic Substances Control Act): Substance is listed.
  - Proposition 65
    - Chemicals known to cause cancer: Substance is listed.
    - Chemicals known to cause reproductive toxicity for females: Substance is not listed.
    - Chemicals known to cause reproductive toxicity for males: Substance is not listed.
    - Chemicals known to cause developmental toxicity: Substance is not listed.

- Carcinogenic categories
- EPA (Environmental Protection Agency)
  - Substance is not listed.
Trade name: 4,4′-Methylenebis(2-chloroaniline)

- TLV (Threshold Limit Value established by ACGIH)

- NIOSH-Ca (National Institute for Occupational Safety and Health)

  Substance is listed.

- National regulations:

- Additional classification according to Decree on Hazardous Materials:
  Carcinogenic hazardous material group I (extremely dangerous).
  Carcinogenic hazardous material group II (very dangerous).
  Carcinogenic hazardous material group III (dangerous).

- Information about limitation of use:
  Workers are not allowed to be exposed to this hazardous material. Exceptions can be made by the authorities in certain cases.

- Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

16 Other information

The information contained in this document is based on Agilent's state of knowledge at the time of preparation. No warranty as to its accurateness, completeness or suitability for a particular purpose is expressed or implied.

- Department issuing SDS: Document Control / Regulatory
- Contact: regulatory@ultrasci.com
- Date of preparation / last revision 03/24/2019 / 1
- Abbreviations and acronyms:
  ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
  IMDG: International Maritime Code for Dangerous Goods
  DOT: US Department of Transportation
  IATA: International Air Transport Association
  ACGIH: American Conference of Governmental Industrial Hygienists
  EINECS: European Inventory of Existing Commercial Chemical Substances
  CAS: Chemical Abstracts Service (division of the American Chemical Society)
  NFPA: National Fire Protection Association (USA)
  HMIS: Hazardous Materials Identification System (USA)
  VOC: Volatile Organic Compounds (USA, EU)
  LC50: Lethal concentration, 50 percent
  LD50: Lethal dose, 50 percent
  PBT: Persistent, Bioaccumulative and Toxic
  vPvB: very Persistent and very Bioaccumulative
  NIOSH: National Institute for Occupational Safety
  OSQA: Occupational Safety & Health
  TLV: Threshold Limit Value
  PEL: Permissible Exposure Limit
  REL: Recommended Exposure Limit
  BEI: Biological Exposure Limit
  Acute Tox. 4: Acute toxicity – Category 4
  Carc. 1B: Carcinogenicity – Category 1B

* Data compared to the previous version altered.