Material Safety Data Sheet

CARESTREAM HEALTH-SPECIFIC INFORMATION

Product name: CD103-5

Product code: 30027030

Synonyms: None.

VENDOR-SPECIFIC INFORMATION

Cima NanoTech
Advanced materials for electronics

Product Name: CD103-5
Company: Cima Nano Tech, Inc.
U.S.A. Office: 1000 Westgate Drive
City, State, Zip St Paul, MN 55114-1067
Technical Phone: 651-646-6266
Fax: 651-646-4161
Emergency Phone: North America 800-424-9300
Emergency Phone: International 703-527-3887 (CALL COLLECT)
Israel Office: 3077
Street Address 12 Tarshish St
City, State, Zip Industrial Park, 38900 Caesarea
Technical Phone: 972 4-6307000
Fax: 972 4-6379526

Material Safety Data Sheet CD103-5

Section 2. Composition/information on ingredients

<table>
<thead>
<tr>
<th>Wt %</th>
<th>Substance Name</th>
<th>CAS #</th>
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<tr>
<td>4.5-8.0</td>
<td>Silver</td>
<td>7440-22-4</td>
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<tr>
<td>Yes</td>
<td>Toluene</td>
<td>108-88-3</td>
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<tr>
<td>Yes</td>
<td>Cyclohexanone</td>
<td>108-94</td>
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<tr>
<td>0.1-0.2</td>
<td>Aniline</td>
<td>62-53-3</td>
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Formula Ag dispersed in mixture of C7H8, C6H10O and C6H7N; Silver dispersed in mixture of Toluene, Cyclohexanone and Aniline.

Synonyms: Silver; Antisal 1a * Benzene, methyl- * CP 25 *Methacide * Methane, phenyl- *
Methylbenzene *Methylbenzol * NCI-C07272 * Phenylmethane * RCRA waste number U220 * Toluene
(Dutch) * Toluene(Czech) * Toluene (ACGIH:OSHA) * Toluene (Spanish) * Toluol * Toluolo (Italian) * Tolu-Sol; Anone * Cicloesanone (Italian) *
Cyclohexanon (Dutch) * Cyclohexanone (ACGIH:OSHA) *
Cyclohexyl ketone * Cykloheksanon (Polish) * Hexanon * Hytrol O * Ketohexamethylene *
Nadone*
NCI-C55005 * Pimelic ketone * Pimelin ketone * RCRA waste number U057 * Sextone;
Aminobenzene
* Aminophen * Anilin (Czech) * Anilina (Italian, Polish) * Aniline and homologues
(ACGIH: OSHA)
* Aniline oil * Anyvim * Benzenamine * Benzene, amino * Benzidam * Blue Oil * C.I. 76000
* C.I.
Oxidation Base 1 * Cyanol * Huile d’aniline (French) * Krystallin * Kyanol * NCI-
C03736 * Phenylamine * RCRA waste number U012

RTECS Number: VW3500000 Silver
RTECS Number: XS5250000 Toluene
RTECS Number: GW1050000 Cyclohexanone
RTECS Number: BW6650000 Aniline

------Section 3. Hazards identification, including emergency overview------

EMERGENCY OVERVIEW
Highly flammable. Irritating to skin. Harmful: danger of serious damage to health by
prolonged
exposure through inhalation. Possible risk of harm to the unborn child. Harmful: may
cause lung
damage if swallowed. Vapors may cause drowsiness and dizziness.
Aniline: Carc. Cat.3 Muta. Cat.3
HMIS RATING
HEALTH: 2
FLAMMABILITY: 3
REACTIVITY: 0

NFFA RATING
HEALTH: 2
FLAMMABILITY: 3
REACTIVITY: 0

------Section 4. First aid measures------

INHALATION EXPOSURE
If inhaled, remove to fresh air. If not breathing give artificial respiration. If
breathing is
difficult, give oxygen. Call a physician.
ORAL EXPOSURE
If swallowed, do not induce vomiting; call a physician immediately.
DERMAL EXPOSURE
In case of contact, immediately wash skin with soap and copious amounts of water
EYE EXPOSURE
In case of contact with eyes, flush with copious amounts of water for at least 15
minutes.
Assure adequate flushing by separating the eyelids with fingers. Call a physician.
Date of Issue: October 24, 2005
Date of Revision: March 23, 2008

------Section 5. Fire fighting measures------

SPECIAL RISKS
Specific Hazard(s): Flammable liquid. Emits toxic fumes under fire conditions.
Explosion Hazards: Vapor may travel considerable distance to source of ignition and flash
back. Container explosion can occur under fire conditions. In advanced or massive fires, the area should be evacuated and the fire should be fought from a remote explosion-resistant location.

**EXTINGUISHING MEDIA:** Suitable: Carbon dioxide, dry chemical powder, or appropriate foam. DO NOT use water on fire where molten metal is present. Other materials: Sand.

**FIREFIGHTING**

Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

Specific Method(s) of Fire Fighting: Use foam to cool fire-exposed containers.

-----Section 6. Accidental release measures-----

**PROCEDURE TO BE FOLLOWED IN CASE OF LEAK OR SPILL:** Evacuate area. Shut off all sources of ignition. Use nonsparking tools.

**PROCEDURE (S) OF PERSONAL PRECAUTION (S):** Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

**METHODS FOR CLEANING UP:** Ventilate area and wash spill site after material pickup is complete. Cover with dry-lime, sand, or soda ash. Place in covered containers using non-sparking tools and transport outdoors.

-----Section 7. Handling and storage-----

**HANDLING**

User Exposure: Do not breathe vapor. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure.

**STORAGE**

Suitable: Keep tightly closed.

**SPECIAL REQUIREMENTS**

Do not distill to dryness.

-----Section 8. Exposure controls/personal protection-----

**ENGINEERING CONTROLS:**

Safety shower and eye bath. Mechanical exhaust required. Use nonsparking tools. Mechanical exhaust required.

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**PERSONAL PROTECTIVE EQUIPMENT**

Respiratory: Government approved respirator.

Hand: Compatible chemical-resistant gloves.

Eye: Chemical safety goggles.

**GENERAL HYGIENE MEASURES:**

Remove and wash contaminated clothing promptly. Wash thoroughly after handling.

**EXPOSURE LIMIT STANDARDS:** Silver

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<th>Country</th>
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<th>Type</th>
<th>Value</th>
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<td>USA MSHA Standard-air</td>
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<tr>
<td>MG/M3</td>
<td>PEL 8H</td>
<td>TWA</td>
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## Exposure Limits Standards: Toluene

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## Exposure Limits Standards: Cyclohexanone

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EXPOSURE LIMITS STANDARDS: Aniline

Country: Poland
Poland: MG/M3
Poland: NDSD
Poland: NDSCh
DENMARK: OEL
GERMANY: TRGS 900
NORWAY: OEL
SWEDEN: LLV
SWITZERLAND: OEL
UNITED KINGDOM: OEL

-------Section 9. Physical and chemical properties-------

Appearance: Physical State: Liquid
Color: Dark Grey

Property: Specific gravity: Value: 0.8-1.0 g/cc
Material Safety Data Sheet

Solvents properties

Flash point:
4 DEG.C (Toluene), 44DEG.C (Cyclohexanone),
70 DEG.C (Aniline),
Method: closed cup

Explosion limits:
Lower: 1.2 % Upper: 7.0 % (Toluene),
Lower: 1.1 % Upper: 9.4 % (Cyclohexanone),
Lower: 1.3 % Upper: 11 % (Aniline),

Autoignition temp:
535 DEG.C (Toluene), 420DEG.C (Cyclohexanone),
615DEG.C (Aniline),

Flammability:
N/A

Boiling point:
110.6DEG.C (Toluene), 154-156DEG.C (Cyclohexanone),
184DEG.C (Aniline)

Vapor pressure:
21.75 mm Hg (20DEG.C) (Toluene)

Vapor density (air=1):
N/A

Evaporation rate (butyl acetate=1): 1.9 (Toluene).

------Section 10. Stability and reactivity------

STABILITY
Stable: Stable.
Materials to Avoid: Strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS
Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide.

HAZARDOUS POLYMERIZATION
Hazardous Polymerization: Will not occur

------Section 11. Toxicological information------

Toluene data
Toxicological Data:
Oral rat LD50: 636 mg/kg; skin rabbit LD50: 14100 uL/kg; inhalation rat LC50: 49 gm/m3/4H;
Irritation data: skin rabbit, 500 mg, Moderate; eye rabbit, 2 mg/24H, Severe.
Investigated as a tumorigen, mutagen and reproductive effector.

Reproductive Toxicity:
Has shown some evidence of reproductive effects in laboratory animals.
IARC - Group 3, i. e., "Cannot be classified as to its carcinogenicity in humans."

Aniline data
Toxicological Data:
Oral rat LD50: 250 mg/kg; skin rabbit LD50: 820 mg/kg; inhalation mouse LC50: 175 ppm (7 hours);
Irritation skin rabbit: 20 mg/24H moderate; irritation eye rabbit 102 mg severe.
Investigated as a tumorigen, mutagen, and reproductive effector.
Carcinogenic determination: limited evidence in experimental animals (IARC 27, 54, 1982). IARC -Group 3, i. e., "Cannot be classified as to its carcinogenicity in humans."

------Section 12. Ecological information------

ECOTOXICOLOGICAL EFFECTS (Toluene)
Test Type: EC50 Algae
Species: Chlorella vulgaris
Time: 24 h
Value: 245 mg/l

Test Type: EC50 Algae
Species: Selenastrum capricornutum resp.
Time: 24 h
Value: 10 mg/l
Test Type: EC50 Daphnia
Species: Daphnia magna
Time: 24 h
Value: 8 mg/l
Test Type: LC50 Fish
Species: Lepomis macrochirus (Bluegill)
Time: 96 h
Value: 74.0 - 340.0 mg/l
Test Type: LC50 Fish
Species: Onchorhynchus mykiss (Rainbow trout)
Time: 96 h
Value: 7.63 mg/l

-----Section 13. Disposal considerations-----

APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION
Contact a licensed professional waste disposal service to dispose of this material.
Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Observe all federal, state, and local environmental regulations.

-----Section 14. Transport information-----

RID/ADR
UN#: 1294
Class: 3
PG: II
Proper Shipping Name: Toluene
IMDG
UN#: 1294
Class: 3
PG: II
Proper Shipping Name: Toluene
Marine Pollutant: No
Severe Marine Pollutant: No
IATA
UN#: 1294
Class: 3
PG: II
Proper Shipping Name: Toluene
Inhalation Packing Group I: No

-----Section 15. Regulatory information-----

EU DIRECTIVES CLASSIFICATION
ANNEX I INDEX NUMBER: 601-021-00-3
INDICATION OF DANGER: F-Xn
Highly Flammable. Harmful.
Highly flammable. Irritating to skin. May cause cancer. Harmful: danger of serious damage to health by prolonged exposure through inhalation. Possible risk of harm to the unborn child. Harmful: may cause lung damage if swallowed. Vapors may cause drowsiness and dizziness.
Date of Issue: October 24, 2005
Date of Revision: March 23, 2008

S-PHRASES: 36/37-38-46-62
Wear suitable protective clothing and gloves. In case of insufficient ventilation, wear suitable respiratory equipment. If swallowed, seek medical advice immediately and show this container or label. If swallowed, do not induce vomiting: seek medical advice immediately and show this container or label.

<table>
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<tr>
<th>Country/Region</th>
<th>Aniline</th>
<th>Cyclohexanone</th>
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<tbody>
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------Section 16. Other information ------

DISCLAIMER
Dispersion is to be used for manufacturing, processing, or repacking. Trace amounts of non-hazardous elements and compounds may be present.

WARRANTY
The above information is believed to be correct but does not purport to be all-inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Cima NanoTech, Inc., shall not be held liable for any damage resulting from handling or from contact with the above product.

CD103-5
Date of Issue: October 24, 2005
Date of Revision: March 23, 2008
Revision 2

This document and all included information, data, documents, etc. are strictly