

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING**Product identifier****Product name** MIXED ACID REAGENT**Other means of identification****Product Code(s)** V-6278**Recommended use of the chemical and restrictions on use****Recommended Use** Use as a laboratory reagent. Laboratory chemicals. Industrial (not for food or food contact use).**Details of the supplier of the safety data sheet****Manufacturer Address**LaMotte Company, Inc.
802 Washington Avenue
P.O. Box 329
Chestertown, MD 21620 USA
T 410-778-3100
F 410-778-9748**Emergency telephone numbers**

(CHEM-TEL):USA, Canada, Puerto Rico 1-800-255-3924 Outside North American Continent (Call collect) 813-248-0585

2. HAZARDS IDENTIFICATION

Serious eye damage/eye irritation

Category 2A

EMERGENCY OVERVIEW**WARNING****Hazard statements**

Causes serious eye irritation.

**Appearance** Clear Blue green**Physical state** liquid**Odor** vinegar**Precautionary Statements - Prevention**

Wash face, hands and any exposed skin thoroughly after handling. Wear eye/face protection.

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.

IF ON SKIN: Wash with plenty of soap and water. Take off contaminated clothing and wash before reuse.

IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

IF SWALLOWED: Drink 1 or 2 glasses of water. Call a physician immediately.

Storage:

Store in a well-ventilated place. Keep cool.

Disposal:

Dispose of contents/containers in accordance with local regulations.

3. COMPOSITION/INFORMATION ON INGREDIENTS*

| Chemical name | CAS No. | Weight-% |
|---------------------|------------|----------|
| Acetic acid | 64-19-7 | 2 |
| Citric acid | 77-92-9 | 4 |
| Sodium chloride USP | 7647-14-5 | 10 |
| Ammonium chloride | 12125-02-9 | 17 |
| Water | 7732-18-5 | to 100% |

4. FIRST AID MEASURES**First Aid Measures****General advice**

Do not get in eyes, on skin, or on clothing. Show this safety data sheet to the doctor in attendance.

Eye contact

Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Call a physician immediately.

Skin contact

Wash off immediately with soap and plenty of water for at least 15 minutes. Take off contaminated clothing and wash before reuse. Consult a physician if necessary.

| | |
|--|--|
| Inhalation | Remove to fresh air. If symptoms persist, call a physician. |
| Ingestion | Drink plenty of water. Consult a physician if necessary. |
| <u>Self-protection of the first aider</u> | Use personal protection recommended in Section 8. Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. |
| Notes to Physician | Treat symptomatically. |

5. FIREFIGHTING MEASURES

Suitable extinguishing media

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Protective equipment and precautions for firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

| | |
|----------------------------------|---|
| Personal precautions | Use personal protection recommended in Section 8. Avoid contact with skin, eyes or clothing. |
| Environmental precautions | See Section 12 for additional Ecological Information. Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas. |

Methods and material for containment and cleaning up

| | |
|--------------------------------|---|
| Methods for containment | Dispose of contents/containers in accordance with local regulations. Absorb/Cover spill with sodium bicarbonate or sodium carbonate to neutralize, then place in a chemical waste container for later disposal. |
| Methods for cleaning up | After cleaning, flush away traces with water. If local regulations permit, rinse to drain with excess water. |

7. HANDLING AND STORAGE

Precautions for safe handling

| | |
|-----------------|--|
| Handling | Handle in accordance with good industrial hygiene and safety practice. Do not taste or swallow. Avoid contact with skin, eyes or clothing. Do not eat, drink or smoke when using this product. |
|-----------------|--|

Conditions for safe storage, including any incompatibilities

| | |
|------------------------------|--|
| Storage: | Keep containers tightly closed in a dry, cool and well-ventilated place. Protect from moisture. Keep out of the reach of children. |
| Incompatible Products | Alkalis. Strong oxidizing agents. Strong bases. |

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

| Chemical name | ACGIH TLV | OSHA PEL | NIOSH IDLH |
|---------------|-----------|----------|------------|
|---------------|-----------|----------|------------|

| | | | |
|----------------------------------|---|--|--|
| Acetic acid 64-19-7 | STEL: 15 ppm TWA: 10 ppm | TWA: 10 ppm TWA: 25 mg/m ³ (vacated) TWA: 10 ppm (vacated) TWA: 25 mg/m ³ | IDLH: 50 ppm TWA: 10 ppm TWA: 25 mg/m ³ STEL: 15 ppm STEL: 37 mg/m ³ |
| Citric acid 77-92-9 | *- | *- | Not Established |
| Sodium chloride USP 7647-14-5 | *- | *- | Not Established |
| Ammonium chloride 12125-02-9 | STEL: 20 mg/m ³ fume TWA: 10 mg/m ³ fume | (vacated) TWA: 10 mg/m ³ fume (vacated) STEL: 20 mg/m ³ fume | TWA: 10 mg/m ³ fume STEL: 20 mg/m ³ fume |
| Water 7732-18-5 | *- | *- | Not Established |

Appropriate engineering controls**Engineering Measures**

Provide appropriate exhaust ventilation at places where dust is formed. Ensure that eyewash stations and safety showers are close to the workstation location.

Individual protection measures, such as personal protective equipment**Eye/Face Protection**

Wear safety glasses with side shields (or goggles). Avoid contact with eyes.

Skin and body protection

Gloves & Lab Coat. Impervious clothing. Protective gloves. Rubber gloves. Nitrile rubber.

Respiratory protection

Maintain adequate ventilation.

Hygiene Measures

Avoid contact with eyes, skin and clothing. Handle in accordance with good industrial hygiene and safety practice. Wash hands and face before breaks and immediately after handling the product.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

| | | | |
|-----------------------|------------------|-------------|---------|
| Physical state | liquid | Odor | vinegar |
| Appearance | Clear Blue green | | |

| <u>Property</u> | <u>Values</u> | <u>Remarks • Method</u> |
|--------------------------------|--------------------------|-------------------------|
| pH | 2-3 | |
| Melting point / freezing point | No information available | |
| Boiling point / boiling range | > 100 °C / 212 °F | |
| Flash point | Not Applicable | |
| Evaporation rate | | |
| Flammability (solid, gas) | No information available | |
| Flammability Limit in Air | | |
| Upper flammability limit: | No information available | |
| Lower flammability limit: | No information available | |
| Vapor pressure | No information available | |
| Vapor density | No information available | |
| Specific gravity | No data available | |
| Water solubility | Soluble in water | |
| Solubility in other solvents | No information available | |
| Partition coefficient | No information available | |
| Autoignition temperature | No information available | |
| Decomposition temperature | No information available | |
| Kinematic viscosity | No information available | |
| Dynamic viscosity | No information available | |
| Explosive properties | No information available | |
| Oxidizing properties | No information available | |

Other Information

| | |
|------------------|--------------------------|
| Softening point | No information available |
| Molecular weight | No information available |
| VOC Content (%) | No information available |
| Density | No information available |
| Bulk density | No information available |

10. STABILITY AND REACTIVITY

| | |
|---|---|
| Stability | Stable. |
| Hazardous Reactions | Hazardous polymerization does not occur. |
| Hazardous polymerization | Hazardous polymerization does not occur. |
| Conditions to avoid | Exposure to air or moisture over prolonged periods. Excessive heat. |
| Incompatible materials | Alkalis. Strong oxidizing agents. Strong bases. |
| Hazardous decomposition products | Ammonia. Hydrogen chloride. Sodium oxides. |

11. TOXICOLOGICAL INFORMATION

Product Information Product does not present an acute toxicity hazard based on known or supplied information

Information on likely routes of exposure

| | |
|---------------------|--|
| Inhalation | None known. |
| Eye contact | May cause temporary eye irritation. |
| Skin contact | Substance may cause slight skin irritation. |
| Ingestion | May be harmful if swallowed. May cause gastrointestinal discomfort if consumed in large amounts. |

Component identification

| Chemical name | ATEmix (oral) | ATEmix (dermal) | Inhalation LC50 |
|----------------------------------|---------------------------------------|-------------------------|-----------------------------------|
| Acetic acid 64-19-7 | = 3310 mg/kg (Rat) | = 1060 mg/kg (Rabbit) | = 11.4 mg/L (Rat) 4 h |
| Citric acid 77-92-9 | = 3 g/kg (Rat) = 3000 mg/kg (Rat) | Not Established | Not Established |
| Sodium chloride USP 7647-14-5 | = 3 g/kg (Rat) | > 10 g/kg (Rabbit) | > 42 g/m ³ (Rat) 1 h |
| Ammonium chloride 12125-02-9 | = 1650 mg/kg (Rat) | Not Established | Not Established |
| Water 7732-18-5 | > 90 mL/kg (Rat) | Not Established | Not Established |

Information on toxicological effects

Carcinogenicity There are no known carcinogenic chemicals in this product.

| Chemical name | ACGIH | IARC | NTP | OSHA |
|----------------------------------|-----------------|-----------------|-----------------|-----------------|
| Acetic acid 64-19-7 | Not Established | Not Established | Not Established | Not Established |
| Citric acid 77-92-9 | Not Established | Not Established | Not Established | Not Established |
| Sodium chloride USP 7647-14-5 | Not Established | Not Established | Not Established | Not Established |
| Ammonium chloride 12125-02-9 | Not Established | Not Established | Not Established | Not Established |
| Water 7732-18-5 | Not Established | Not Established | Not Established | Not Established |

| | |
|------------------------|-----------------|
| ATEmix (oral) | 6,421.00 mg/kg |
| ATEmix (dermal) | 34,641.00 mg/kg |

12. ECOLOGICAL INFORMATION

Ecotoxicity**Unknown Aquatic Toxicity** 0.27 % of the mixture consists of component(s) of unknown hazards to the aquatic environment

| Chemical name | Toxicity to Algae | Toxicity to Fish | Daphnia Magna (Water Flea) |
|----------------------------------|-------------------|---|---|
| Acetic acid 64-19-7 | Not Established | 75: 96 h Lepomis macrochirus mg/L LC50 static 79: 96 h Pimephales promelas mg/L LC50 static | 47: 24 h Daphnia magna mg/L EC50 65: 48 h Daphnia magna mg/L EC50 Static |
| Citric acid 77-92-9 | Not Established | 1516: 96 h Lepomis macrochirus mg/L LC50 static | 120: 72 h Daphnia magna mg/L EC50 |
| Sodium chloride USP 7647-14-5 | Not Established | 4747 - 7824: 96 h Oncorhynchus mykiss mg/L LC50 flow-through 5560 - 6080: 96 h Lepomis macrochirus mg/L LC50 flow-through 6020 - 7070: 96 h Pimephales promelas mg/L LC50 static 6420 - 6700: 96 h Pimephales promelas mg/L LC50 static 12946: 96 h Lepomis macrochirus mg/L LC50 static 7050: 96 h Pimephales promelas mg/L LC50 semi-static | 340.7 - 469.2: 48 h Daphnia magna mg/L EC50 Static 1000: 48 h Daphnia magna mg/L EC50 |
| Ammonium chloride 12125-02-9 | Not Established | 209: 96 h Cyprinus carpio mg/L LC50 static 725: 24 h Lepomis macrochirus mg/L LC50 | 202: 24 h Daphnia magna mg/L LC50 |
| Water 7732-18-5 | Not Established | Not Established | Not Established |

Persistence and degradability

No information available.

Bioaccumulation/Accumulation

No information available.

| Chemical name | Log Pow |
|----------------------------------|-----------------|
| Acetic acid 64-19-7 | -0.31 |
| Citric acid 77-92-9 | -1.72 |
| Sodium chloride USP 7647-14-5 | Not Established |
| Ammonium chloride 12125-02-9 | Not Established |
| Water 7732-18-5 | Not Established |

13. DISPOSAL CONSIDERATIONS**Disposal Methods**

Dispose of contents/containers in accordance with local regulations.

Contaminated packaging

Dispose of waste product or used containers according to local regulations.

| Chemical name | RCRA | RCRA - Basis for Listing | RCRA - D Series Wastes | RCRA - U Series Wastes |
|----------------------------------|-----------------|--------------------------|------------------------|------------------------|
| Acetic acid 64-19-7 | Not Established | - | Not Established | Not Established |
| Citric acid 77-92-9 | Not Established | - | Not Established | Not Established |
| Sodium chloride USP 7647-14-5 | Not Established | - | Not Established | Not Established |
| Ammonium chloride 12125-02-9 | Not Established | - | Not Established | Not Established |
| Water 7732-18-5 | Not Established | - | Not Established | Not Established |

| Chemical name | RCRA - Halogenated Organic Compounds | RCRA - P Series Wastes | RCRA - F Series Wastes | RCRA - K Series Wastes |
|---------------|--------------------------------------|------------------------|------------------------|------------------------|
| | | | | |

| | | | | |
|----------------------------------|-----------------|-----------------|-----------------|-----------------|
| Acetic acid 64-19-7 | Not Established | Not Established | Not Established | Not Established |
| Citric acid 77-92-9 | Not Established | Not Established | Not Established | Not Established |
| Sodium chloride USP 7647-14-5 | Not Established | Not Established | Not Established | Not Established |
| Ammonium chloride 12125-02-9 | Not Established | Not Established | Not Established | Not Established |
| Water 7732-18-5 | Not Established | Not Established | Not Established | Not Established |

| Chemical name | California Hazardous Waste Status |
|----------------------------------|-----------------------------------|
| Acetic acid 64-19-7 | Toxic Corrosive Ignitable |
| Citric acid 77-92-9 | *- |
| Sodium chloride USP 7647-14-5 | *- |
| Ammonium chloride 12125-02-9 | *- |
| Water 7732-18-5 | *- |

14. TRANSPORT INFORMATION

| | |
|------------------------|---------------|
| <u>DOT</u> | Not regulated |
| <u>TDG</u> | Not regulated |
| <u>MEX</u> | Not regulated |
| <u>ICAO</u> | Not regulated |
| <u>IATA</u> | Not regulated |
| <u>IMDG/IMO</u> | Not regulated |
| <u>RID</u> | Not regulated |
| <u>ADR</u> | Not regulated |
| <u>ADN</u> | Not regulated |

15. REGULATORY INFORMATION

International Inventories

| | |
|----------------------|-----------------|
| TSCA | Complies |
| DSL/NDL | Does not comply |
| EINECS/ELINCS | Does not comply |
| ENCS | Does not comply |
| IECSC | Complies |
| KECL | Does not comply |
| PICCS | Complies |
| AICS | Complies |

Legend:

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory

DSL/NDL - Canadian Domestic Substances List/Non-Domestic Substances List

EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances

ENCS - Japan Existing and New Chemical Substances

IECSC - China Inventory of Existing Chemical Substances

KECL - Korean Existing and Evaluated Chemical Substances
 PICCS - Philippines Inventory of Chemicals and Chemical Substances
 AICS - Australian Inventory of Chemical Substances

US Federal Regulations**SARA 313**

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

| Chemical name | SARA 313 - Threshold Values % |
|----------------------------------|-------------------------------|
| Acetic acid 64-19-7 | Not Established |
| Citric acid 77-92-9 | Not Established |
| Sodium chloride USP 7647-14-5 | Not Established |
| Ammonium chloride 12125-02-9 | 1.0 |
| Water 7732-18-5 | Not Established |

SARA 311/312 Hazard Categories

| | |
|-----------------------------------|-----|
| Acute health hazard | Yes |
| Chronic Health Hazard | No |
| Fire hazard | No |
| Sudden release of pressure hazard | No |
| Reactive Hazard | No |

CWA (Clean Water Act)

This product contains the following substances which are regulated pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

| Chemical name | CWA - Reportable Quantities | CWA - Toxic Pollutants | CWA - Priority Pollutants | CWA - Hazardous Substances |
|----------------------------------|-----------------------------|------------------------|---------------------------|----------------------------|
| Acetic acid 64-19-7 | 5000 lb | Not Established | Not Established | X |
| Citric acid 77-92-9 | Not Established | Not Established | Not Established | Not Established |
| Sodium chloride USP 7647-14-5 | Not Established | Not Established | Not Established | Not Established |
| Ammonium chloride 12125-02-9 | 5000 lb | Not Established | Not Established | X |
| Water 7732-18-5 | Not Established | Not Established | Not Established | Not Established |

CERCLA

This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

| Chemical name | Hazardous Substances RQs | CERCLA/SARA RQ | RQ |
|----------------------------------|--------------------------|-----------------|--|
| Acetic acid 64-19-7 | 5000 lb | Not Established | RQ 5000 lb final RQ RQ 2270 kg final RQ |
| Citric acid 77-92-9 | - | Not Established | - |
| Sodium chloride USP 7647-14-5 | - | Not Established | - |
| Ammonium chloride 12125-02-9 | 5000 lb | Not Established | RQ 5000 lb final RQ RQ 2270 kg final RQ |
| Water 7732-18-5 | - | Not Established | - |

US State Regulations

This product does not contain any Proposition 65 chemicals.

| Chemical name | California Proposition 65 |
|------------------------|---------------------------|
| Acetic acid 64-19-7 | Not Established |

| | |
|----------------------------------|-----------------|
| Citric acid 77-92-9 | Not Established |
| Sodium chloride USP 7647-14-5 | Not Established |
| Ammonium chloride 12125-02-9 | Not Established |
| Water 7732-18-5 | Not Established |

U.S. State Right-to-Know Regulations

| Chemical name | New Jersey | Massachusetts | Pennsylvania |
|----------------------------------|-----------------|-----------------|-----------------|
| Acetic acid 64-19-7 | X | X | X |
| Citric acid 77-92-9 | Not Established | Not Established | Not Established |
| Sodium chloride USP 7647-14-5 | Not Established | Not Established | Not Established |
| Ammonium chloride 12125-02-9 | X | X | X |
| Water 7732-18-5 | Not Established | Not Established | X |

CPSC (Consumer Product Safety Commission) - Specially Regulated Substances

| | |
|------------------------|--|
| Chemical name | CPSC (Consumer Product Safety Commission) - Specially Regulated Substances |
| Acetic acid 64-19-7 | Add POISON to label, 16 CFR 1500.129 |

16. OTHER INFORMATION

NFPA

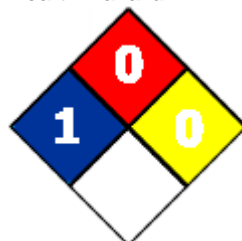
Health hazard 1

Flammability 0

Instability 0

Physical and Chemical Hazards N/A

Health hazard 1



| | |
|---------------|---|
| Health Hazard | 1 |
| Fire Hazard | 0 |
| Reactivity | 0 |

Prepared by
Issuing Date
Revision Date
Disclaimer

Regulatory Affairs Department
Apr-18-2017
May-19-2016

The information provided on this SDS is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guide for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered as a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text.

End of Safety Data Sheet

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING**Product identifier****Product name** Nitrate Reducing Reagent**Other means of identification****Product Code(s)** V-6279**UN-No** 2570**Recommended use of the chemical and restrictions on use****Recommended Use** Use as a laboratory reagent. Laboratory chemicals. Industrial (not for food or food contact use).**Details of the supplier of the safety data sheet****Manufacturer Address**LaMotte Company, Inc.
802 Washington Avenue
P.O. Box 329
Chestertown, MD 21620 USA
T 410-778-3100
F 410-778-9748**Emergency telephone numbers**

(CHEM-TEL):USA, Canada, Puerto Rico 1-800-255-3924 Outside North American Continent (Call collect) 813-248-0585

2. HAZARDS IDENTIFICATION

| | |
|--|-------------|
| Acute toxicity - Oral | Category 4 |
| Acute toxicity - Inhalation (Dusts/Mists) | Category 4 |
| Serious eye damage/eye irritation | Category 2 |
| Germ cell mutagenicity | Category 2 |
| Carcinogenicity | Category 1A |
| Reproductive toxicity | Category 2 |
| Specific target organ toxicity (repeated exposure) | Category 1 |

EMERGENCY OVERVIEW**DANGER****Hazard statements**

Harmful if swallowed. Harmful if inhaled. Causes serious eye irritation. Suspected of causing genetic defects. May cause cancer. Suspected of damaging fertility or the unborn child. Causes damage to organs through prolonged or repeated exposure.

**Appearance** Gray**Physical state** powder**Odor** Slight**Precautionary Statements - Prevention**

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Use personal protective equipment as required. Wash face, hands and any exposed skin thoroughly after handling. Do not eat, drink or smoke when using this product. Use only outdoors or in a well-ventilated area. Wear eye/face protection. Do not breathe dust/fume/gas/mist/vapors/spray.

Response: IF exposed or concerned: Get medical advice/attention.

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

IF ON SKIN: Wash with plenty of soap and water.

IF INHALED: Remove person to fresh air and keep comfortable for breathing.

IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.

Storage:

Store locked up.

Disposal:

Dispose of contents/container to an approved waste disposal plant.

Other Hazards

Very toxic to aquatic life with long lasting effects.

Unknown Acute Toxicity

34.69% of the mixture consists of ingredient(s) of unknown toxicity.

3. COMPOSITION/INFORMATION ON INGREDIENTS*

| Chemical name | CAS No. | Weight-% |
|---|------------|----------|
| N-(1-Naphthyl)ethylenediamine dihydrochloride | 1465-25-4 | <1 |
| Cadmium | 7440-43-9 | 3 |
| Manganese sulfate monohydrate | 10034-96-5 | 10 |
| Ammonium chloride | 12125-02-9 | 45-55 |

4. FIRST AID MEASURES

First Aid Measures

| | |
|--|--|
| General advice | Show this safety data sheet to the doctor in attendance. Do not get in eyes, on skin, or on clothing. |
| Eye contact | Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Call a physician immediately. |
| Skin contact | Wash off immediately with soap and plenty of water for at least 15 minutes. Take off contaminated clothing and wash before reuse. If symptoms persist, call a physician. |
| Inhalation | IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing. If symptoms persist, call a physician. |
| Ingestion | Do not induce vomiting without medical advice. Drink plenty of water. Immediate medical attention is required. |
| <u>Self-protection of the first aider</u> | Use personal protection recommended in Section 8. Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination. |

5. FIREFIGHTING MEASURES

Suitable extinguishing media

Dry chemical or CO₂.

Specific hazards arising from the chemical

Thermal decomposition can lead to release of toxic and corrosive gases/vapors.

Protective equipment and precautions for firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

| | |
|--|--|
| Personal precautions | Use personal protection recommended in Section 8. Wear respiratory protection. If you have not donned special protective clothing approved for this material, do not expose yourself to any risk of this material touching you. Evacuate personnel to safe areas. |
| Other Information | Ventilate the area. |
| Environmental precautions | See Section 12 for additional Ecological Information. Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas. |
| <u>Methods and material for containment and cleaning up</u> | |
| Methods for containment | Do not flush to sewer. Prevent dust cloud. Contain and collect spillage with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see Section 13). |
| Methods for cleaning up | Clean contaminated surface thoroughly. After cleaning, flush away traces with water. |

7. HANDLING AND STORAGE

Precautions for safe handling

Handling Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes or clothing. Do not taste or swallow. Do not breathe vapors/dust.

Conditions for safe storage, including any incompatibilities

Storage: Keep containers tightly closed in a dry, cool and well-ventilated place. Protect from moisture. Do not allow contact with air. Store away from incompatible materials. Keep out of the reach of children.

Incompatible Products Strong acids. Strong oxidizing agents. Strong bases. Finely powdered metals.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

| Chemical name | ACGIH TLV | OSHA PEL | NIOSH IDLH |
|--|--|--|---|
| N-(1-Naphthyl)ethylenediamine dihydrochloride 1465-25-4 | * ₋ | * ₋ | Not Established |
| Cadmium 7440-43-9 | TWA: 0.01 mg/m ³ TWA: 0.002 mg/m ³ respirable fraction TWA: 0.01 mg/m ³ Cd TWA: 0.002 mg/m ³ Cd respirable fraction | TWA: 0.1 mg/m ³ fume applies to any operations or sectors for which the Cadmium standard is stayed or otherwise not in effect TWA: 0.2 mg/m ³ dust applies to any operations or sectors for which the Cadmium standard is stayed or otherwise not in effect TWA: 5 µg/m ³ (vacated) STEL: 0.3 ppm fume Ceiling: 0.3 mg/m ³ fume applies to any operations or sectors for which the Cadmium standard is stayed or otherwise not in effect Ceiling: 0.6 mg/m ³ dust applies to any operations or sectors for which the Cadmium standard is stayed or otherwise not in effect | IDLH: 9 mg/m ³ dust IDLH: 9 mg/m ³ Cd dust and fume |
| Manganese sulfate monohydrate 10034-96-5 | TWA: 0.02 mg/m ³ Mn TWA: 0.1 mg/m ³ Mn | (vacated) Ceiling: 5 mg/m ³ Ceiling: 5 mg/m ³ Mn | IDLH: 500 mg/m ³ Mn TWA: 1 mg/m ³ Mn STEL: 3 mg/m ³ Mn |
| Ammonium chloride 12125-02-9 | STEL: 20 mg/m ³ fume TWA: 10 mg/m ³ fume | (vacated) TWA: 10 mg/m ³ fume (vacated) STEL: 20 mg/m ³ fume | TWA: 10 mg/m ³ fume STEL: 20 mg/m ³ fume |

NIOSH IDLH: *Immediately Dangerous to Life or Health*

Appropriate engineering controls

Engineering Measures Showers
Eyewash stations
Ventilation systems.

Individual protection measures, such as personal protective equipment

Eye/Face Protection Wear safety glasses with side shields (or goggles). If splashes are likely to occur.. Face protection shield.

Skin and body protection Gloves & Lab Coat. Wear protective gloves/clothing. Protective gloves. Nitrile rubber.

Respiratory protection Handle in an enclosing hood with exhaust ventilation. When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.

Hygiene Measures Use only with adequate ventilation. Wear suitable gloves and eye/face protection. Avoid contact with eyes, skin and clothing. Wash hands and face before breaks and immediately after handling the product. Handle in accordance with good industrial hygiene and safety practice. Do not eat, drink or smoke when using this product.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical state powder
Appearance Gray Odor Slight

| <u>Property</u> | <u>Values</u> | <u>Remarks • Method</u> |
|--------------------------------|--------------------------|-------------------------|
| pH | 7 | (0.1g/10mL water) |
| Melting point / freezing point | No information available | |
| Boiling point / boiling range | No information available | |
| Flash point | Not Applicable | |
| Evaporation rate | | |
| Flammability (solid, gas) | No information available | |
| Flammability Limit in Air | | |
| Upper flammability limit: | No information available | |
| Lower flammability limit: | No information available | |
| Vapor pressure | No information available | |
| Vapor density | No information available | |
| Specific gravity | No information available | |
| Water solubility | Partly soluble | |
| Solubility in other solvents | No information available | |
| Partition coefficient | No information available | |
| Autoignition temperature | No information available | |
| Decomposition temperature | No information available | |
| Kinematic viscosity | No information available | |
| Dynamic viscosity | No information available | |
| Explosive properties | No information available | |
| Oxidizing properties | No information available | |

Other Information

Softening point No information available
Molecular weight No information available
VOC Content (%) No information available
Density No information available
Bulk density No information available

10. STABILITY AND REACTIVITY

Stability Stable under recommended storage conditions.
Hazardous polymerization Hazardous polymerization does not occur.
Conditions to avoid Exposure to air or moisture over prolonged periods. Excessive heat. Incompatible Products.
Incompatible materials Strong acids. Strong oxidizing agents. Strong bases. Finely powdered metals.
Hazardous decomposition products May emit toxic fumes under fire conditions. Cadmium oxides. Ammonia. Carbon oxides (COx). Nitrogen oxides (NOx). Sodium oxides. Hydrogen chloride gas.

11. TOXICOLOGICAL INFORMATION

Product Information Harmful if swallowed, inhaled, or absorbed through skin

Information on likely routes of exposure

Component identification

| Chemical name | ATEmix (oral) | ATEmix (dermal) | Inhalation LC50 |
|-------------------------------|-----------------|-----------------|-----------------|
| N-(1-Naphthyl)ethylenediamine | Not Established | Not Established | Not Established |

| | | | |
|---|----------------------|-----------------|---------------------------------------|
| dihydrochloride 1465-25-4 | | | |
| Cadmium 7440-43-9 | = 1140 mg/kg (Rat) | Not Established | = 25 mg/m ³ (Rat) 30 min |
| Manganese sulfate monohydrate 10034-96-5 | = 782 mg/kg (Rat) | Not Established | Not Established |
| Ammonium chloride 12125-02-9 | = 1650 mg/kg (Rat) | Not Established | Not Established |

Information on toxicological effects

| Chemical name | ACGIH | IARC | NTP | OSHA |
|--|-----------------|-----------------|-----------------|-----------------|
| N-(1-Naphthyl)ethylenediamine dihydrochloride 1465-25-4 | Not Established | Not Established | Not Established | Not Established |
| Cadmium 7440-43-9 | A2 | Group 1 | Known | X |
| Manganese sulfate monohydrate 10034-96-5 | Not Established | Not Established | Not Established | Not Established |
| Ammonium chloride 12125-02-9 | Not Established | Not Established | Not Established | Not Established |

ACGIH (American Conference of Governmental Industrial Hygienists)

A2 - Suspected Human Carcinogen

IARC (International Agency for Research on Cancer)

Group 1 - Carcinogenic to Humans

NTP (National Toxicology Program)

Known - Known Carcinogen

OSHA (Occupational Safety and Health Administration of the US Department of Labor)

X - Present

| | |
|--------------------------------------|-----------------|
| ATEmix (oral) | 1,403.00 mg/kg |
| ATEmix (dermal) | 26,806.00 mg/kg |
| ATEmix (inhalation-dust/mist) | 1.22 mg/l |

12. ECOLOGICAL INFORMATION**Ecotoxicity**

Very toxic to aquatic life with long lasting effects

Unknown Aquatic Toxicity 2.54 % of the mixture consists of component(s) of unknown hazards to the aquatic environment

| Chemical name | Toxicity to Algae | Toxicity to Fish | Daphnia Magna (Water Flea) |
|--|-------------------|--|---|
| N-(1-Naphthyl)ethylenediamine dihydrochloride 1465-25-4 | Not Established | Not Established | Not Established |
| Cadmium 7440-43-9 | Not Established | 0.0004 - 0.003: 96 h Pimephales promelas mg/L LC50 0.002: 96 h Cyprinus carpio mg/L LC50 0.003: 96 h Oncorhynchus mykiss mg/L LC50 flow-through 0.006: 96 h Oncorhynchus mykiss mg/L LC50 static 0.016: 96 h Oryzias latipes mg/L LC50 0.24: 96 h Cyprinus carpio mg/L LC50 static 21.1: 96 h Lepomis macrochirus mg/L LC50 flow-through 4.26: 96 h Cyprinus carpio mg/L LC50 semi-static | 0.0244: 48 h Daphnia magna mg/L EC50 Static |
| Manganese sulfate monohydrate 10034-96-5 | Not Established | Not Established | Not Established |
| Ammonium chloride 12125-02-9 | Not Established | 209: 96 h Cyprinus carpio mg/L LC50 static 725: 24 h Lepomis macrochirus mg/L LC50 | 202: 24 h Daphnia magna mg/L LC50 |

Persistence and degradability

No information available.

Bioaccumulation/Accumulation

| Chemical name | Log Pow |
|--|-----------------|
| N-(1-Naphthyl)ethylenediamine dihydrochloride 1465-25-4 | Not Established |
| Cadmium 7440-43-9 | Not Established |
| Manganese sulfate monohydrate 10034-96-5 | Not Established |
| Ammonium chloride 12125-02-9 | Not Established |

13. DISPOSAL CONSIDERATIONS

Disposal Methods Dispose of waste product or used containers according to local regulations. Should not be released into the environment.

Contaminated packaging Dispose of waste product or used containers according to local regulations.

| Chemical name | RCRA | RCRA - Basis for Listing | RCRA - D Series Wastes | RCRA - U Series Wastes |
|--|-----------------|---|---------------------------|------------------------|
| N-(1-Naphthyl)ethylenediamine dihydrochloride 1465-25-4 | Not Established | - | Not Established | Not Established |
| Cadmium 7440-43-9 | Not Established | Included in waste streams: F006, F039, K061, K069, K100 | 1.0 mg/L regulatory level | Not Established |
| Manganese sulfate monohydrate 10034-96-5 | Not Established | - | Not Established | Not Established |
| Ammonium chloride 12125-02-9 | Not Established | - | Not Established | Not Established |

| Chemical name | RCRA - Halogenated Organic Compounds | RCRA - P Series Wastes | RCRA - F Series Wastes | RCRA - K Series Wastes |
|--|--------------------------------------|------------------------|------------------------|------------------------|
| N-(1-Naphthyl)ethylenediamine dihydrochloride 1465-25-4 | Not Established | Not Established | Not Established | Not Established |
| Cadmium 7440-43-9 | Not Established | Not Established | Not Established | Not Established |
| Manganese sulfate monohydrate 10034-96-5 | Not Established | Not Established | Not Established | Not Established |
| Ammonium chloride 12125-02-9 | Not Established | Not Established | Not Established | Not Established |

| Chemical name | California Hazardous Waste Status |
|--|-----------------------------------|
| N-(1-Naphthyl)ethylenediamine dihydrochloride 1465-25-4 | *- |
| Cadmium 7440-43-9 | *- |
| Manganese sulfate monohydrate 10034-96-5 | *- |
| Ammonium chloride 12125-02-9 | *- |

14. TRANSPORT INFORMATION

DOT

Proper shipping name CADMIUM COMPOUNDS
UN-No 2570
Hazard Class 6.1
Packing group III

| | |
|-----------------------------|------------------|
| <u>TDG</u> | Not regulated |
| <u>MEX</u> | Not regulated |
| <u>ICAO</u> | Not regulated |
| <u>IATA</u> | |
| UN-No | 2570 |
| Proper shipping name | CADMIUM COMPOUND |
| Hazard Class | 6.1 |
| Packing group | III |
| <u>IMDG/IMO</u> | |
| UN-No | 2570 |
| Proper shipping name | CADMIUM COMPOUND |
| Hazard Class | 6.1 |
| Packing group | III |
| <u>RID</u> | |
| UN-No | 2570 |
| Proper shipping name | CADMIUM COMPOUND |
| Hazard Class | 6.1 |
| Packing group | III |
| <u>ADR</u> | |
| UN-No | 2570 |
| Proper shipping name | CADMIUM COMPOUND |
| Hazard Class | 6.1 |
| Packing group | III |
| <u>ADN</u> | Not regulated |

15. REGULATORY INFORMATION

International Inventories

| | |
|----------------------|-----------------|
| TSCA | Complies |
| DSL/NDL | Does not comply |
| EINECS/ELINCS | Does not comply |
| ENCS | Does not comply |
| IECSC | Complies |
| KECL | Does not comply |
| PICCS | Complies |
| AICS | Complies |

Legend:

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDL - Canadian Domestic Substances List/Non-Domestic Substances List
EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances
ENCS - Japan Existing and New Chemical Substances
IECSC - China Inventory of Existing Chemical Substances
KECL - Korean Existing and Evaluated Chemical Substances
PICCS - Philippines Inventory of Chemicals and Chemical Substances
AICS - Australian Inventory of Chemical Substances

US Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

| Chemical name | SARA 313 - Threshold Values % |
|--|-------------------------------|
| N-(1-Naphthyl)ethylenediamine dihydrochloride 1465-25-4 | Not Established |

| | |
|---|-----|
| Cadmium 7440-43-9 | 0.1 |
| Manganese sulfate monohydrate 10034-96-5 | 1.0 |
| Ammonium chloride 12125-02-9 | 1.0 |

SARA 311/312 Hazard Categories

| | |
|--|-----|
| Acute health hazard | Yes |
| Chronic Health Hazard | Yes |
| Fire hazard | No |
| Sudden release of pressure hazard | No |
| Reactive Hazard | No |

CWA (Clean Water Act)

This product contains the following substances which are regulated pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

| Chemical name | CWA - Reportable Quantities | CWA - Toxic Pollutants | CWA - Priority Pollutants | CWA - Hazardous Substances |
|--|-----------------------------|------------------------|---------------------------|----------------------------|
| N-(1-Naphthyl)ethylenediamine dihydrochloride 1465-25-4 | Not Established | Not Established | Not Established | Not Established |
| Cadmium 7440-43-9 | Not Established | X | X | Not Established |
| Manganese sulfate monohydrate 10034-96-5 | Not Established | Not Established | Not Established | Not Established |
| Ammonium chloride 12125-02-9 | 5000 lb | Not Established | Not Established | X |

CERCLA

This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

| Chemical name | Hazardous Substances RQs | CERCLA/SARA RQ | RQ |
|--|--------------------------|-----------------|--|
| N-(1-Naphthyl)ethylenediamine dihydrochloride 1465-25-4 | *- | Not Established | - |
| Cadmium 7440-43-9 | 10 lb | Not Established | RQ 10 lb final RQ RQ 4.54 kg final RQ |
| Manganese sulfate monohydrate 10034-96-5 | *- | Not Established | - |
| Ammonium chloride 12125-02-9 | 5000 lb | Not Established | RQ 5000 lb final RQ RQ 2270 kg final RQ |

US State Regulations**California Proposition 65**

WARNING! This product contains a chemical known to the State of California to cause cancer and birth defects or other reproductive harm.

| Chemical name | California Proposition 65 |
|--|--|
| N-(1-Naphthyl)ethylenediamine dihydrochloride 1465-25-4 | Not Established |
| Cadmium 7440-43-9 | Carcinogen Developmental Male Reproductive |
| Manganese sulfate monohydrate 10034-96-5 | Not Established |
| Ammonium chloride 12125-02-9 | Not Established |

U.S. State Right-to-Know Regulations

| Chemical name | New Jersey | Massachusetts | Pennsylvania |
|--|-----------------|-----------------|-----------------|
| N-(1-Naphthyl)ethylenediamine dihydrochloride 1465-25-4 | Not Established | Not Established | Not Established |
| Cadmium | X | X | X |

| | | | |
|---|---|-----------------|---|
| 7440-43-9 | | | |
| Manganese sulfate monohydrate 10034-96-5 | X | Not Established | X |
| Ammonium chloride 12125-02-9 | X | X | X |

CPSC (Consumer Product Safety Commission) - Specially Regulated Substances

| | |
|------------------------------|--|
| Chemical name | CPSC (Consumer Product Safety Commission) - Specially Regulated Substances |
| Cadmium 7440-43-9 | Regulated, CPSIA Section 106 |
| 16. OTHER INFORMATION | |

NFPA

Health hazard 3

Flammability 0

Instability 0

Physical and Chemical
Hazards N/A

Health hazard 3



| | |
|---------------|----------|
| Health Hazard | 3 |
| Fire Hazard | 0 |
| Reactivity | 0 |

Prepared by
Issuing Date
Revision Date
Disclaimer

Regulatory Affairs Department
Apr-30-2015
Dec-22-2016

The information provided on this SDS is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guide for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered as a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text.

End of Safety Data Sheet