1. Chemical Product and Company Identification

Product Name: MCA, 70% Solution in Water
Chemical Name: Monochloroacetic acid
Synonym: Chloroacetic acid
C.A.S. Registry No.: 79-11-8
Chemical Formula: ClCH₂-COOH
Product Use: Chemical intermediate

Supplier
Akzo Nobel Functional Chemicals LLC
P.O. Box 40350
Denver, CO  80204-0350, USA
Tel. [Product & Technical Information]:  (303) 937-7482

Emergency Telephone Numbers
FOR CHEMICAL EMERGENCY (Spill, Leak, Fire, Exposure or Accident)
  CHEMTREC (24-hr):  (800) 424-9300 (Toll-free in the U.S., Canada, and the U.S. Virgin Islands)
  (703) 527-3887 (For calls originating elsewhere / collect calls are accepted)

FOR MEDICAL / HANDLING EMERGENCIES: 1-914-693-6946 [AkzoNobel - USA]

Revision Date: August 7, 2009
Changes: Sections 1, 2, 4, 12, 16

2. Hazards Identification

EMERGENCY OVERVIEW

This material is considered hazardous by the OSHA Hazard Communication Standard [29 CFR 1910.1200]

DANGER! POISON
  ▪ MCA is rapidly absorbed through the skin. May be toxic even if small areas of skin are exposed. Skin exposure may cause death. See Section 4 (First Aid Measures).
  ▪ May be fatal if swallowed and/or inhaled.
  ▪ Symptoms may be delayed by hours.
  ▪ Causes burns – Corrosive to eyes, skin and upper respiratory tract.
  ▪ Very toxic to aquatic organisms. Avoid release to the environment.
  ▪ Contains material which may cause damage to the heart, brain, central nervous system, liver, kidney, lung and vascular systems.

Appearance and odor: colorless to pale yellow liquid with a pungent acidic odor.

POTENTIAL HEALTH EFFECTS [See Section 11 for additional information]
Primary Route(s) of Exposure: Skin contact, eye contact and inhalation.
2. Hazards Identification (Continued)

Acute Exposure

- **Skin Contact:** Contact causes severe irritation, redness, pain and severe burns. Monochloroacetic acid is rapidly absorbed by the skin and then released to the systemic circulation which can lead to severe refractory metabolic lactic acidosis poisoning. Human fatalities have resulted from exposure to molten and liquid material when 10% or more body surface coverage occurred.

- **Inhalation:** Inhalation of monochloroacetic acid heated vapor, fume, mist or aerosol may cause severe irritation of the mucous membranes, nose, throat and lungs. Persons with lung disease are at greater risk. Symptoms of lung injury are often delayed some hours and are aggravated by physical effort. Central nervous system involvement produces symptoms of disorientation, excitation, coma and possibly death.

- **Ingestion:** This product is toxic by ingestion, likely to cause throat pain, abdominal pain and interference with essential enzyme systems. Symptoms may include nausea, vomiting, diarrhea and bloody stools. Perforation of the esophagus and stomach may occur and death may result from cardiovascular collapse.

- **Eye Contact:** Eye contact with solid material or solutions may cause profound tissue damage including corneal and conjunctival edema, corneal opacity and corneal destruction accompanied by pain, lacrimation, and conjunctivitis. Corneal damage frequently results in blindness.

**Carcinogenicity:** IARC, NTP, ACGIH and OSHA do not classify this material or its components as a carcinogen or suspect carcinogen.

**Medical conditions aggravated:** Persons with pre-existing skin and/or respiratory disease may be at increased risk if exposed to this material.

**POTENTIAL ENVIRONMENTAL EFFECTS** [See Section 12 for additional information]

This product is very toxic to aquatic life based on available data.

3. Composition / Information on Ingredients

<table>
<thead>
<tr>
<th>INGREDIENTS</th>
<th>CAS Number</th>
<th>% (w/w)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monochloroacetic acid</td>
<td>79-11-8</td>
<td>70.0</td>
</tr>
<tr>
<td>Water</td>
<td>7732-18-5</td>
<td>30.0</td>
</tr>
</tbody>
</table>

4. First Aid Measures

First-aid personnel should wear PVC or neoprene gloves and full body protective gear to avoid becoming contaminated with MCA.

**SKIN CONTACT**

- Call “911” or a Poison Control Center and obtain emergency medical attention if the area of the exposed skin on any part of the body is greater than 1% of the total body surface area. An area of 1% of the total body surface area corresponds to approximately 1/2 of the total surface area of one hand, for example, the surface area you can cover with one hand with the fingers widely spread. The emergency medical services responders should transport the victim to a hospital as soon as possible with a copy of this Material Safety Data Sheet.

- If available, place patient in an emergency bath containing a saturated aqueous solution of sodium bicarbonate (7-9%) and keep victim in the bath for at least 30 minutes. Contaminated clothing and shoes should be removed in the bath and discarded. Excess baking soda should be visible at the bottom of the treatment bath. The water temperature should be 86°F (30°C).

- If bicarbonate bath is not available, immediately place victim under an emergency shower and flush with copious amounts of water even under clothing. With continued flushing, remove all contaminated clothing and shoes and discard them. Continue to flush with large amounts of running water for at least 15 minutes. Delayed irreversible effects are possible.
4. First Aid Measures (Continued)

INHALATION: Delayed irreversible effects are possible.

- If a known exposure occurs or is suspected, do not wait for symptoms to develop. Immediately call 911 or the nearest Poison Control Center to request immediate medical assistance. The emergency medical services responders should transport the victim to a hospital as soon as possible with a copy of this Material Safety Data Sheet.
- In addition, follow the procedures below and simultaneously contact a poison control center, a physician or the nearest hospital. Even if the victim is not in any distress at the time, inform the person contacted of the type and extent of exposure, describe the victim’s symptoms and follow the advice given.
- Remove victim to fresh air. If not breathing, clear victim’s airway and start artificial respiration. If victim is breathing, supplemental oxygen may be given from a demand-type or continuous–flow inhaler, preferably with a physician’s advice.

INGESTION

- Call 911 or the nearest Poison Control Center to request emergency medical assistance. The emergency medical services responders should transport the victim to a hospital as soon as possible with a copy of this Material Safety Data Sheet.
- Call a physician or a poison control center immediately. ONLY induce vomiting at the instructions of a physician. If victim is conscious, rinse mouth, and give water to drink. If vomiting occurs, keep head below hips to reduce risk of aspiration. Give fluids again. Never give anything by mouth to a person who is unconscious or convulsing.

EYE CONTACT

- Immediate first aid is required to prevent eye damage. Flush eyes with plenty of water for at least 15 minutes. If victim is wearing contact lenses, remove them if possible. Take care not to contaminate the victim’s healthy eye or skin. Hold the eyelids apart during the flushing to ensure rinsing of the entire surface of the eye and lids with water. DO NOT let victim rub eye(s). Do not attempt to neutralize with chemical agents. Oils or ointments should not be used at this time. Get medical attention immediately. Continue flushing for an additional 15 minutes if a physician is not immediately available.

NOTE TO PHYSICIAN:

- Monochloroacetic acid exposure has two primary aspects: 1) effects related to exposure to a strong acid, and 2) a specific systemic metabolic toxicity associated with the monochloroacetate anion. The monochloroacetate anion inhibits pyruvate dehydrogenase and α-ketoglutarate dehydrogenase enzyme complexes and forces cells to revert to anaerobic glycolysis leading to lactate accumulation.
- Attending physician should treat exposed patients symptomatically. Monochloroacetic acid is rapidly absorbed through intact the skin and then released into the systemic circulation. The release into the circulation may cause a delayed severe refractory metabolic lactic acidosis.
- In case of ingestion, evacuate stomach contents through a stomach tube, preferably introduced under endoscopic control. Published studies in rats experimentally dosed with MCA indicate that gastric emptying is delayed with MCA ingestion.
- Timely administration of intravenous sodium dichloroacetate (SDCA) may be life saving in case of serious monochloroacetate intoxication. SDCA is not approved for medical use in the United States. Treatment is symptomatic and supportive without it. For a treatment protocol, contact the nearest Poison Control Center or Akzo Nobel Emergency Center in the Netherlands (Tel. +31 570 67 92 11) and ask for IPCS INTOX PIM 352. Alternately, you can consult the online INTOX database at: http://www.intox.org/databank/documents/chemical/monocacd/pim352.htm

5. Fire Fighting Measures

Conditions of Flammability: not flammable or combustible
Flash Point (Method): > 244°F (> 118°C) [Pensky-Martens Closed Cup]
Upper Flammable Limit (% by volume): not determined
5. Fire Fighting Measures

**Lower Flammable Limit (% by volume):** not determined

**Auto-Ignition Temperature:** 869°F (465°C)

**Extinguishing Media:** This product is considered non-combustible. If involved in a fire, extinguishing agents suitable for the surrounding materials should be used. Use water spray, dry chemical powder, carbon dioxide or alcohol resistant foam extinguishing agents. Water used to extinguish a fire should not be allowed to enter public water systems in case of MCA leakage.

**Fire Fighting Procedures:** Products of combustion are irritating to the respiratory tract and may cause breathing difficulty and pulmonary edema. Symptoms may be delayed several hours or longer depending upon the extent of the exposure. As in any fire, prevent human exposure to fire, smoke, fumes or products of combustion. Evacuate all non-essential personnel from the fire area. Fire fighters should wear full-face, self-contained breathing apparatus and impervious protective clothing. If possible, move containers from the fire area. If not leaking, keep fire exposed containers cool with a water fog or spray to prevent rupture due to excessive heat. High pressure water may spread product from broken containers increasing contamination or fire hazard. Contaminated buildings, areas and equipment must not be used until they are properly decontaminated. Dike fire control water for later disposal. Do not allow contaminated water to enter waterways.

**Fire and Explosion Hazards:** Not considered a flammable or combustible material. However, under fire conditions, this product may support combustion and decompose to give off toxic and corrosive combustion materials. MCA is explosive at higher temperatures when mixed with air. In case of fire and/or explosion, do not breathe fumes.

**Hazardous Combustion Products:** Thermal decomposition produces very toxic substances including carbon monoxide and hydrochloric acid and formaldehyde.

**NFPA Hazard Rating – Health:** 4

<table>
<thead>
<tr>
<th>Health</th>
<th>Flammability</th>
<th>Instability</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 – Minimal</td>
<td>1 – Slight</td>
<td>2 – Moderate</td>
<td>3 – High</td>
</tr>
</tbody>
</table>

6. Accidental Release Measures

**Personal Protection:** Avoid contact with skin and eyes. Do not breathe vapors. See section 8 for additional information on appropriate personal protective equipment.

**Spill or Leaks / Cleanup:** Isolate spill area and restrict non-essential personnel from area. Stop source of spill if this is possible without being injured. Neutralize spill with sodium (bi)carbonate (Na₂CO₃ / NaHCO₃) and flush with water. Absorb with a suitable inert material (such as sand or earth). Remove absorbed material and place into a chemical waste container for disposal according to regulations. Flush spill area with large amount of water and dike for later disposal. Avoid release to the environment.

**Environmental Precautions:** When the product contaminates public waters, inform appropriate authorities in accordance with local regulations.

7. Handling and Storage

**Handling:** This material is a toxic and corrosive liquid. Avoid inhalation and prolonged and/or repeated skin and eye contact. Use only with adequate ventilation. Wash thoroughly after handling. Do not drink, eat or smoke in application areas. Emptied containers may retain residues. Follow all warnings and precautions even after the container is emptied. Additionally, solutions of sodium bicarbonate (7-9%) should be available in the immediate work area. Large quantity users may want to install a thermostatically controlled (30°C) emergency bath containing the saturated bicarbonate solution as an added precaution.
7. Handling and Storage (Continued)

Storage: Store away from foodstuffs or animal feed. Containers should be kept tightly closed and stored in a cool and well-ventilated area away from incompatible materials such as bases and amines. Exercise due caution to prevent damage to or leakage from the container. Store in polyethylene, glass-lined, PVC or 316L stainless steel equipment (for service temperature below 30°C or 86°F). Do not store in direct sunlight and keep away from heat sources.

Storage Temperature: In case of bulk storage, the temperature should be kept as low as possible (7-30°C / 45-86°F) in order to keep the solution liquid and avoid unnecessary hydrolysis and corrosion.

General Comments: Keep containers tightly closed until ready for use. Prevent overheating (see section 5).

8. Exposure Controls / Personal Protection

Applicable Exposure Limits:

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>OSHA – PELs</th>
<th>ACGIH – TLVs</th>
<th>NIOSH – RELs</th>
<th>AIHA – WEELs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TWA</td>
<td>STEL / CEIL[C]</td>
<td>TWA</td>
<td>STEL / CEIL[C]</td>
</tr>
<tr>
<td>Monochloroacetic acid</td>
<td>N/D</td>
<td>N/D</td>
<td>2 mg/m³ 0.5 ppm (see notes 1+2)</td>
<td>N/D</td>
</tr>
<tr>
<td>Water</td>
<td>N/D</td>
<td>N/D</td>
<td>N/D</td>
<td>N/D</td>
</tr>
</tbody>
</table>


1. Can be absorbed through the skin.
2. Measured as inhalable fraction and vapor

Legend:
CEIL: Ceiling Exposure Limit
STEL: Short Term Exposure Limit
N/D: Not Determined
ACGIH: American Conference of Governmental Industrial Hygienists
AIHA: American Industrial Hygiene Association
NIOSH: National Institute for Occupational Safety and Health
OSHA: Occupational Safety and Health Administration

Engineering Controls – Ventilation: Sufficient natural or mechanical ventilation must be provided to keep concentrations of MCA in air below applicable exposure limits and to help minimize exposures. Where ventilation is inadequate based on conditions of use, personnel protective equipment is needed (see next paragraph for full details). If use conditions generate aerosols, the material should be handled in an open (e.g. outdoor) or well ventilated area.

Personal Protective Equipment

- Respiratory Protection: If use conditions generate vapor, mist or aerosol and adequate ventilation (e.g., outdoor or well-ventilated area) is not available, use a NIOSH-approved organic vapor/acid gas respirator with mist and fume filter to reduce potential for inhalation exposure. Where exposure potential necessitates a higher level of protection, use a NIOSH-approved, positive-pressure/pressure-demand, air-supplied respirator. When using respirator cartridges or canisters, they must be changed frequently (following each use or at the end of the work shift) to assure breakthrough exposure does not occur.

- Eye Protection: Eye contact with this material must be prevented through the use of chemical safety splash goggles or a face shield selected with regard to use condition exposure potential.
8. Exposure Controls / Personal Protection (Continued)

- **Skin Protection:** Skin contact with the product must be prevented through the use of suitable (acid-resistant) protective clothing, gloves and footwear selected according to use condition exposure potential. Protective equipment made of polyvinyl chloride (PVC) or neoprene is recommended. PVC gloves [manufactured by Ansell, type Snorkel] have a breakthrough time of 60 minutes at 40°C. Discard gloves after MCA contact.

**Other Protection – General Hygiene Considerations:** Safety showers, with quick opening valves, which stay open, and eyewash fountains, or other means of washing the eyes with a gentle flow of cool to tepid tap water, should be readily available in all areas where this material is handled or stored. Water should be supplied through insulated and heat-traced lines to prevent freeze-up in cold weather. Long sleeved clothing may be used to minimize skin contact. All food and smoking materials should be kept in a separate area away from the storage/use location. Eating, drinking and smoking should be prohibited in areas where there is a potential for significant exposure to this material. Before eating, drinking and smoking, hands and face should be thoroughly washed.

9. Physical and Chemical Properties

**Physical State / Appearance / Odor:** colorless to pale yellow liquid with a pungent acidic odor

**Boiling Point:** ≈ 280°F (138°C)

**Bulk Density:** not applicable

**Cloud Point:** not determined

**Evaporation Rate (Butyl Acetate=1):** not determined

**Melting Point:** 32°F (0°C) – crystallization temperature

**Odor Threshold:** 0.045 ppm (MCA solid)

**pH:** < 1 (at 800 g/L water, 68°F/20°C)

**Partition Coefficient (n-octanol/water):** Log P_{ow} = - 0.2 (calculated)

**Pour Point:** not determined

**Solubility in water:** MCA Flakes: 4210 g/L (68°F/20°C); 9640 g/L (104°F/40°C)

**Solubility in other solvents:** soluble in acetone, ethanol and methanol

**Specific Gravity (H2O = 1):** 1290 kg/m³ (86°F/30°C)

**Vapor Density (Air = 1):** not determined

**Vapor Pressure:** MCA + water = 1.6 kPa (68°F/20°C); 3.8 kPa (104°F/40°C)

**Viscosity:** 5.2 mPa.s (68°F/20°C); 4.4 mPa.s (77°F/25°C)

**Volatiles (% by weight):** not determined

**Other:** not determined

**Conditions of Flammability:** not flammable or combustible

**Flash Point (Method):** > 244°F (> 118°C) [Pensky-Martens Closed Cup]

**Upper Flammable Limit (% by volume):** not determined

**Lower Flammable Limit (% by volume):** not determined

**Auto-Ignition Temperature:** 869°F (465°C)

< : less than    > : greater than    = : approximately

10. Stability and Reactivity

**Stability:** This product is stable at ambient temperature and atmospheric pressure as well as under recommended storage and handling conditions. Thermal decomposition occurs at temperatures above 250°C (482°F). It is not self-reactive and has an almost indefinite shelf-life under sealed conditions. It is not sensitive to physical impact. Slight hydrolysis may occur when stored under recommended conditions (see section 7).
10. Stability and Reactivity (Continued)

Conditions to avoid: Avoid prolonged storage at elevated temperatures. In order to prevent thermal decomposition, do not overheat.

Materials to avoid: This material is incompatible with most plastics, except hard PVC, PP, PE and PTFE. MCA might react violently with non-precious metals and produce hydrogen. Danger of explosion may result from contact with strong bases, strong oxidizing agents and amines. Exothermic reactions may occur with alcohols.

Polymerization: Hazardous polymerization is not expected to occur under normal temperature and pressure.

Decomposition Products: Under fire conditions the product decomposes to give off toxic and corrosive hydrogen chloride gas, carbon oxides and formaldehyde.

11. Toxicological Information

INHALATION
Acute exposure: The acute LC₅₀ is not available. MCA is believed to be very toxic by inhalation.
Chronic exposure: Chronic inflammation leads to local irritant effects in the upper airways.

INGESTION
Acute exposure: The oral LD₅₀ for monochloroacetic acid is reported as 55 mg/kg (rat), per RTECS. This product is considered toxic by ingestion.
Chronic exposure: Ingestion may result in severe irritation of the mouth, throat, nasal cavities, esophagus and stomach. A 90-day oral study in rats reported a NOAEL of 30 mg/kg/day. Cardiomyopathy was observed at doses of 60 mg/kg/day and higher. Increased relative liver weights and liver enzyme changes suggested the liver was also affected, but microscopic lesions were not observed.

SKIN
Acute contact: Dermal toxicity (LD₅₀) for a 40% solution of monochloroacetic acid has been stated as 305 mg/kg in rats. Follow the recommendations in Section 4 (First Aid Measures) for any MCA exposure. In humans, systemic toxicity has been reported with exposure to at least 5% of body surface area. Deaths have been reported following exposure of larger skin areas. This product is corrosive to skin. Monochloroacetic acid is rapidly absorbed in the skin and then released into the systemic circulation. The release into the circulation may cause a delayed severe refractory metabolic lactic acidosis.
Chronic contact: Prolonged and/or repeated skin contact may result in burns, irritation or dermatitis, as well as toxic systemic effects.

EYES: This product is severely irritating and corrosive to the eyes, as tested on rabbits.

SENSITIZATION: No reliable data available.

CARCINOGENICITY: IARC, NTP, ACGIH and OSHA do not classify this material or its components as a carcinogen or suspect carcinogen. Monochloroacetic acid was not carcinogenic in a 2-yr feeding study (rat, mouse).

MUTAGENICITY: Product is not mutagenic as tested in the Ames Assay.

REPRODUCTIVE TOXICITY: In a study that is only available as an abstract, it has been reported that MCA, when administered to pregnant rats at doses of 140 mg/kg/day (a dose which caused a significant decrease in maternal weight gain), cause malformations in the cardiovascular system of the fetuses, predominantly levocardia. Skeletal malformations were not observed.
11. Toxicological Information (Continued)

Other Toxicological Effects: In vitro cytogenicity tests show positive effects at cytotoxic doses accompanied with dramatic changes in pH of culture medium. Cytogenicity tests in vivo show equivocal results. Central nervous system involvement, caused by acute or chronic exposure, has resulted in symptoms of disorientation, excitation, coma and possibly death. The lethal effects may be associated with cerebral lactic acidosis in combination with systemic lactic acidosis.

TARGET ORGANS: Eyes, skin, respiratory tract, heart, brain, central nervous system, skeletal muscles, liver, kidneys, lungs and vascular system.

12. Ecological Information

Ecotoxicity: It is expected to be very toxic to aquatic life based on available data with the technical (solid) MCA:

<table>
<thead>
<tr>
<th>Substance</th>
<th>Test / Species</th>
<th>Exposure / Duration</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monochloroacetic acid (MCA)</td>
<td>Fish (Poecilia reticulata)</td>
<td>96-h</td>
<td>LC₅₀ = 369 mg/L</td>
</tr>
<tr>
<td></td>
<td>Daphnia magna</td>
<td>48-h</td>
<td>EC₅₀ = 88 mg/L</td>
</tr>
<tr>
<td></td>
<td>Algae (Scenedesmus subspicatus)</td>
<td>21 days</td>
<td>NOEC = 32 mg/L</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Biodegradation: Monochloroacetic acid is readily biodegradable in water.

Other Ecotoxicity information: None known.

13. Disposal Considerations

Waste Disposal: Material that cannot be used or chemically reprocessed should be collected in MCA-resistant drums and disposed of at an approved facility in accordance with all applicable regulations. This product, if unused, is not a RCRA-listed waste and does not meet the RCRA criteria for hazardous wastes by characteristics. Generators of waste material are required to evaluate all waste for compliance with RCRA and any applicable state and local disposal procedures and regulations. Dispose of waste in accord with local, state and federal regulations. Incineration may be used where permitted by regulations.

NOTE! – State and local regulations may be more stringent than federal regulations.

Container Disposal: Containers should be cleaned of residual product before disposal. Do not contaminate public waters with waste or rinsate. Emptied containers may retain residues. Follow all warnings and precautions even after the container is emptied. Empty containers should be disposed of in accordance with all applicable laws and regulations.

14. Transport Information

Shipping Information: This product is regulated for shipping as follows:

<table>
<thead>
<tr>
<th></th>
<th>RQ, Chloroacetic acid solution, UN1750, 6.1 (8), PG II</th>
</tr>
</thead>
<tbody>
<tr>
<td>US – DOT</td>
<td>RQ, Chloroacetic acid solution, UN1750, 6.1 (8), PG II</td>
</tr>
<tr>
<td>Canada – TDG</td>
<td>Chloroacetic acid solution, UN1750, 6.1 (8), PG II</td>
</tr>
<tr>
<td>IMDG / IATA / ICAO</td>
<td>UN1750, Chloroacetic acid solution, 6.1 (8), PG II</td>
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<tr>
<td>ERAP Index</td>
<td>1000</td>
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</tbody>
</table>

2008 Emergency Response Guidebook No.: 153
14. Transport Information (Continued)

Required Labels: Poison (Primary Hazard - Class 6.1)
Corrosive (Subsidiary Hazard - Class 8)

Environmentally Hazardous Substances [49 CFR 172.101, Appendix A]: Monochloroacetic acid has a Reportable Quantity (RQ) of 100 lbs (45.4 kg).

15. Regulatory Information

The components are subject to the following environmental regulatory lists:

<table>
<thead>
<tr>
<th>Substance Name</th>
<th>CAA</th>
<th>CERCLA</th>
<th>IARC</th>
<th>US STATE RIGHT-TO-KNOW LISTS</th>
<th>CA PROP 65</th>
<th>SARA</th>
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</thead>
<tbody>
<tr>
<td>Monochloroacetic acid</td>
<td>X</td>
<td>N/R</td>
<td>N/R</td>
<td>MA / MN / NJ / PA</td>
<td>N/R</td>
<td></td>
</tr>
<tr>
<td>Water</td>
<td>N/R</td>
<td>N/R</td>
<td>N/R</td>
<td>N/R</td>
<td>N/R</td>
<td>N/R</td>
</tr>
</tbody>
</table>

Monochloroacetic acid X 112(b) X N/R MA / MN / NJ / PA N/R 302/313

National Chemical Inventories Status:

<table>
<thead>
<tr>
<th>Substance Name</th>
<th>US TSCA</th>
<th>Canada DSL</th>
<th>Canada NDSL</th>
<th>EU EINECS</th>
<th>Australia AICS</th>
<th>New Zealand NZIoC</th>
<th>Japan ENCS</th>
<th>Korea KECI</th>
<th>Philippines PICCS</th>
<th>China IECSC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monochloroacetic acid</td>
<td>X</td>
<td>X</td>
<td>N/R</td>
<td>N/R</td>
<td>X</td>
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<td>X</td>
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</tr>
</tbody>
</table>

N/R = Non Regulated X = Listed / Regulated

Legend
AICS Australian Inventory of Chemical Substances
CA List California – Directors List of Hazardous Substances
CA Prop 65 California Proposition 65
CAA Clean Air Act, Section 112
CERCLA CERCLA Hazardous Substances
DSL Domestic Substances List – Canada
EINECS European Inventory of Existing Commercial Chemical Substances
ENCS Japan Existing and New Chemical Substances
FL List Florida – Substance List
IARC International Agency for Research on Cancer – Carcinogens/Groups 1, 2A or 2B
IECSC China – Inventory of Existing Chemical Substances
IL List Illinois Toxic Substances Disclosure to Employees Act
KECI Korea Existing Chemicals Inventory
LA List Louisiana Right-to-Know Reporting List
MA List Massachusetts – R-T-K Substance List
MN List Minnesota – Hazardous Substance List
NDSL Non-Domestic Substances List – Canada
NJ R-T-K New Jersey – R-T-K Hazard List
NZIoC New Zealand Inventory of Chemicals
PA List Pennsylvania Hazardous Substance List
PICCS Philippines Inventory of Chemicals and Chemical Substances
RI List Rhode Island – Hazardous Substance List
SARA SARA Title III, Section 302 / 313
TSCA Toxic Substances Control Act – USA

Canada – WHMIS (Workplace Hazardous Materials Information System):
- Class D1A [Very Toxic Effects]
- Class D2B [Toxic Effects]
- Class E [Corrosive]

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.
16. Other Information

HMIS RATING – Health: 4*  Flammability: 1  Physical Hazard: 0  Other: none

[ 0 – Minimal  1 - Slight  2 - Moderate  3 - High  4 - Extreme  * - Chronic Health Hazard (see Section 11)]

Other Information: None known.

Revisions made in sections: 1, 2, 4, 12, 16

Prepared by: AkzoNobel, Technology & Engineering [Tel. 613.273.8095]

The information in this Material Safety Data Sheet should be provided to all who will use, handle, store, transport or otherwise be exposed to this product. AkzoNobel makes no warranty, express or implied as to the product’s merchantability or fitness for any particular purpose, or that any suggested use will not infringe any patent. Nothing contained herein shall be construed as granting or extending any license under any patent. Buyer shall determine for himself, by preliminary tests or otherwise, the suitability of this product for his purposes, including mixing with other products. The information contained herein supersedes all previously issued bulletins on the subject matter covered. If the date of this document is more than three years old, please call to ensure that this sheet is current.

[00707_061108]