

Material Safety Data for: Monoethanolamine

1. PRODUCT IDENTIFICATION

| | |
|---------------------|---|
| Name | 2-aminoethanol |
| Synonyms | 2-hydroxyethylamine, 2-amino-1-ethanol, 1-amino-2-hydroxyethanol & others |
| CAS# | 141-43-5 |
| Product Uses | agricultural chemicals, cleaners, polishes, cosmetics, corrosion inhibitor, H ₂ S removal from natural gas |

2. INGREDIENTS

| | % | TWAEV / TLV mg/m ³ | LD ₅₀ ORAL | (mg/kg) SKIN | LC ₅₀ ppm INHALATION |
|------------------|------|----------------------------------|--------------------------|-----------------|------------------------------------|
| Monoethanolamine | 100% | 3 / 7.5 | 620 | 1020 | 486 |

3. (a) HAZARDS SUMMARY

Hazards, Quick Guide: combustible liquid & vapour, may be corrosive to skin and eyes; decomposition products may be toxic

Canada – WHMIS

Key:

B 3, D 2B, E

B 2 – Flash Point <38°C, B 3 – Flash Point >38°C & <93°C

D 1 – Immediately Toxic, D 2 – Chronic Toxicity

C – Oxidising Substance, E – Corrosive

U.S.A. – HMIS

Key:

Health – 3, Fire – 2, Reactivity – 1

0=minimal, 1=slight, 2=moderate, 3=serious, 4=severe

3. (b) HAZARDS – TOXICITY

Effects, Acute Exposure

| | |
|-----------------|---|
| Skin Contact | may be corrosive; severely irritating to mouth, throat & stomach |
| Skin Absorption | yes; however, no toxic effects expected by this route |
| Eye Contact | corrosive and may cause permanent damage |
| Inhalation | vapour likely to be irritating; may cause laboured breathing, wheezing and pulmonary oedema; low vapour pressure reduces likelihood of inhalation |
| Ingestion | burns in mouth, throat, stomach pain, vomiting – not a route of industrial exposure |

Effects, Chronic Exposure

| | |
|-------------------------------|---|
| General | prolonged exposure to vapour can cause bronchitis; may cause dermatitis & skin cracking |
| Sensitising | not a respiratory sensitiser in humans or animals; there have been a few human cases of skin sensitisation in people working with cutting fluids containing MEA |
| Carcinogen/Tumorigen | not listed as a tumorigen or a carcinogen in humans or animals; there is a slight excess of stomach & oesophageal cancer in people working with MEA |
| Reproductive Effect | no known effect in humans or animals |
| Mutagen | no known effect on humans or animals |
| Synergistic With | not known |
| LD ₅₀ (oral) | 1515, 1720, 1970, 2050-3320mg/kg (rat), 700 & 1475mg/kg (mouse), 620 & 820mg/kg (guinea pig), 1000mg/kg (rabbit) |
| LD ₅₀ (skin) | 1020mg/kg (rabbit) |
| LC ₅₀ (inhalation) | 486ppm (mouse) |

Please ensure that this MSDS is given to, and explained to people using this product.

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4. FIRST AID

SKIN: Wash with plenty of water. Remove contaminated clothing and do not reuse until thoroughly laundered.
EYES: Wash eyes with plenty of water, holding eyelids open. Seek medical assistance promptly if there is irritation.
INHALATION: Remove from contaminated area promptly. **CAUTION: Rescuer must not endanger himself!** If breathing stops, administer artificial respiration and seek medical aid promptly.
INGESTION: Give plenty of water to dilute product. Do not induce vomiting (NOTE below). Keep victim quiet. If vomiting occurs, lower victim's head below hips to prevent inhalation of vomited material. Seek medical help promptly.
Inadvertent inhalation of vomited material may seriously damage the lungs. The danger of this is greater than the risk of poisoning through absorption of this relatively low-toxicity substance. The stomach should only be emptied under medical supervision, and after the installation of an airway to protect the lungs.

5. PHYSICAL PROPERTIES

| | |
|---|---|
| Odour & Appearance | clear, colourless viscous, hygroscopic liquid with a mild ammonia (fishy) odour |
| Odour Threshold | 2-5ppm |
| Vapour Pressure | 0.4mmHg / 0.053kPa (25°C / 77°F) |
| Evaporation Rate (<i>Butyl Acetate = 1</i>) | not known – slower than mineral spirits |
| Vapour Density (air = 1) | 2.1 |
| Boiling Range | 171°C / 340°F |
| Melting Point | 10.5°C / 51°F – <i>supercools readily; may take days to freeze @ -10°C</i> |
| Specific Gravity | 1.018 (20/20°C) |
| Water Solubility | complete |
| Also soluble in | most organic solvents; limited solubility in aromatic or aliphatic hydrocarbons |
| Viscosity | 19centipoise (25°C / 77°F) |
| pH | 11.7 |
| Conversion Factor | 1ppm = 2.49mg/m ³ |
| Molecular Weight | 61grams per mole |

6. FLAMMABILITY & FIRE FIGHTING

| | |
|----------------------------|--|
| Flash Point | 86°C / 186°F (closed cup) |
| Autoignition Temperature | 410°C / 770°F |
| Flammable Limits | 3.0% – 23.5% |
| Combustion Products | carbon monoxide, nitrogen oxides, ammonia, hydrogen cyanide, nitriles, isocyanates, nitrosamines, formaldehyde, and other products |
| Fire Fighting Precautions | foam, dry chemical, water fog or spray; fire fighters must wear SCBA |
| Static Charge Accumulation | cannot accumulate a static charge |

7. STABILITY / REACTIVITY

| | |
|--------------------------------|---|
| Dangerously Reactive With | strong oxidising agents; strong acids; cellulose nitrate; halogens (Cl, F, Br), alkali metals, & various monomers |
| Also Reactive With | hypochlorites to form explosive chloroamines; forms shock sensitive substances with mercury, nitromethane & nitrophenols; with CO ₂ forms unstable amine carbamates which can burn spontaneously in air; <i>exposure to H₂SO₄ & HNO₃ forms explosive nitro compounds;</i> |
| Stability | reacts with aluminium at elevated temperature to yield hydrogen gas stable; will not polymerise; gradually oxidises (exothermic) in air; spontaneous combustion may occur if MEA is absorbed onto a high surface area substance (eg: wire mesh); |
| Decomposes in Presence of | heat – above 200°C / 392°F; <i>self-sustaining exothermic decomposition from 250°C / 482°F</i> |
| Decomposition Products | apart from Hazardous Combustion Products, thermally unstable carbamates |
| Sensitive to Mechanical Impact | no |

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8. PROTECTIVE EQUIPMENT / EXPOSURE CONTROL

| | |
|-------------|---|
| ACGIH TLV | 3ppm / 7.5mg/m ³ |
| OSHA PEL | 3ppm / 6mg/m ³ |
| STEL | 6ppm / 15mg/m ³ |
| Ventilation | mechanical ventilation may be required to maintain airborne titre below regulated limits; depending on handling procedures; if a respirator is (occasionally) used, it must contain an organic vapour cartridge |
| Hands | nitrile, butyl, or neoprene gloves recommended – <i>consult supplier to confirm suitability or find substitutes</i> |
| Eyes | safety glasses with side shields – <i>always protect the eyes</i> |
| Clothing | wear impermeable (above) apron, boots, & long sleeves if there is any danger of splashing |

9. HANDLING & STORAGE

Store in a cool, dry environment, away from sources of ignition, heat, oxidising agents and substances named in Part 7 (above).

On exposure to air, this product may oxidise or react with atmospheric CO₂ to form unstable compounds. Ensure that containers are full and tightly sealed. Empty containers may contain a flammable / explosive vapour. Always ensure that containers, whether empty or full, or part full, are tightly sealed unless in use.

Avoid breathing product vapour. Use with adequate ventilation. If dealing with a spill, and ventilation is impossible or impractical, wear a suitable respirator with organic vapour cartridge.

Never cut, drill, weld or grind on or near this container. Avoid all contact with skin and wash work clothes frequently. An eye bath and safety shower must be available near the workplace.

10. SPILL PROCEDURES

| | |
|-----------------|---|
| Leak Precaution | dyke to control spillage and prevent environmental contamination |
| Handling Spill | ventilate contaminated area; recover free liquid with suitable pumps; absorb residue on an inert sorbent, sweep, shovel, & store in closed containers for recycling or disposal |

11. DISPOSAL

| | |
|----------------|---|
| Waste Disposal | do not flush to sewer , recycle solvent if possible, may be incinerated in approved facility after mixing with suitable flammable waste |
| Containers | Drums should be reused. Recondition and pressure test by a licensed reconditioner prior to re-use. Pails must be vented and thoroughly dried prior to crushing and recycling. IBCs (intermediate bulk containers): polyethylene bottle must be pressure tested & recertified at 30 months. Replace at 60 months (5yrs). Steel containers must be inspected, pressure tested & recertified every 5 years. <i>Never cut, drill, weld or grind on or near this container, even if empty</i> |

12. ENVIRONMENTAL INFORMATION

| | |
|-------------------------|--|
| Bioaccumulation | this product is highly water soluble & readily metabolised, so cannot bioaccumulate |
| Biodegradation | this product degrades readily in the presence of oxygen with 49%-84% degradation in 5 days |
| Abiotic Degradation | this product reacts with atmospheric hydroxyl radicals; its estimated half-life in air is 11 hours |
| Mobility in soil, water | this product is water soluble and may move readily in soil and water, however, it is expected to become a cation, and in this form may adsorb strongly to most soils |

Aquatic Toxicity

| | |
|------------------------------------|---|
| LC ₅₀ (Fish, 96hr) | 227 & 2070mg/litre (pimephales promelas); 3684mg/litre (brachydanio rerio), 170mg/litre (carassius auratus), 337mg/litre (gambusia affinis), 329mg/litre (lepomis macrochirus), 150mg/litre (oncorhyncs mykiss) |
| EC ₅₀ (Crustacea, 48hr) | 65 & 120mg/litre (daphnia magna) |
| EC ₅₀ (Algae) | 15mg/litre (scenedesmus quadricauda) |

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13. TRANSPORT REGULATIONS

| | | |
|------------------|---------------|--|
| Canada TDG | PIN | UN-2491 |
| AND | Shipping Name | ethanolamine or ethanolamine solutions |
| U.S.A. 49 CFR | Class | 8 |
| | Packing Group | III |
| Marine Pollutant | | not a marine pollutant |

14. EMERGENCY INFORMATION

| | | |
|--------|------------------------|----------------|
| Canada | Call CANUTEC (collect) | (613) 996-6666 |
| U.S.A. | Call CHEMTREC | (800) 424-9300 |

15. REGULATIONS

| | |
|---------------|------------------------------|
| Canada DSL | on inventory |
| U.S.A. TSCA | on inventory |
| Europe EINECS | on inventory (EC# 205-483-3) |

Immediately Dangerous to Life or Health: 30 ppm

OSHA Standards: Permissible Exposure Limit: Table Z-1 8-hr Time Weighted Avg: 3 ppm (6 mg/cu m). Vacated 1989 OSHA PEL TWA 3 ppm (8 mg/cu m); STEL 6 ppm (15 mg/cu m) is still enforced in some states.

NIOSH Recommendations: Recommended Exposure Limit: 10 Hr Time-Weighted Avg: 3 ppm (8 mg/cu m). Recommended Exposure Limit: 15 Min Short-Term Exposure Limit: 6 ppm (15 mg/cu m).

Threshold Limit Values: 8 hr Time Weighted Avg (TWA): 3 ppm; 15 min Short Term Exposure Limit (STEL): 6 ppm.

Atmospheric Standards: This action promulgates standards of performance for equipment leaks of Volatile Organic Compounds (VOC) in the Synthetic Organic Chemical Manufacturing Industry (SOCMI). The intended effect of these standards is to require all newly constructed, modified, and reconstructed SOCMI process units to use the best demonstrated system of continuous emission reduction for equipment leaks of VOC, considering costs, non air quality health and environmental impact and energy requirements. Ethanolamines are produced, as an intermediate or a final product, by process units covered under this subpart. /Ethanolamines/

FIFRA Requirements: As the federal pesticide law FIFRA directs, EPA is conducting a comprehensive review of older pesticides to consider their health and environmental effects and make decisions about their future use. Under this pesticide reregistration program, EPA examines health and safety data for pesticide active ingredients initially registered before November 1, 1984, and determines whether they are eligible for reregistration. In addition, all pesticides must meet the new safety standard of the Food Quality Protection Act of 1996. Pesticides for which EPA had not issued Registration Standards prior to the effective date of FIFRA '88 were divided into three lists based upon their potential for human exposure and other factors, with List B containing pesticides of greater concern and List D pesticides of less concern. 2-Aminoethanol is found on List D. Case No: 4032; Pesticide type: Fungicide, antimicrobial; Case Status: No products containing the pesticide are actively registered. Therefore, we are characterizing the case as "cancelled." Under FIFRA, pesticide producers may voluntarily cancel their registered products. EPA also may cancel pesticide registrations if registrants fail to pay required fees or make/meet certain reregistration commitments, or if EPA reaches findings of unreasonable adverse effects.; Active ingredient (AI): 2-Aminoethanol; AI Status: The active ingredient is no longer contained in any registered products. Thus, we characterize it as "cancelled." Active Ingredients with Recent Production Pending Cancellation of all Products for Non-payment of 1990 Registration Fees: Ethanolamine (CAS 141-43-5). Use: disinfectant/antimicrobial uses. Year last produced: 1989. Registration N. 058018-00001. Product Name: Pro Way Brand Realclean Spray Concentrate. /From Table 2/

FDA Requirements: Ethanolamine is an indirect food additive for use only as a component of adhesives.

16. PREPARATION INFORMATION

Prepared for Megaloid Laboratories by Peter Bursztyn, (705) 734-1577

File Name: MEA

With data from RTECS, Haz. Substance Data Base, Cheminfo (CCOHS), IUCLID Datasheets (European Chem. Substance Info. System), & others, as available
Preparation Date: **December 2003** Revision Date: **December 2006, November 2009**

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