MONOETHANOLAMINE (MEA)

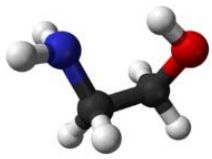
Chemical Formula: C_2H_7NO

CAS Registry Number: 141-43-5

Chemical Weight: 61.08

Category: Ethanolamine

PRODUCT INFORMATION



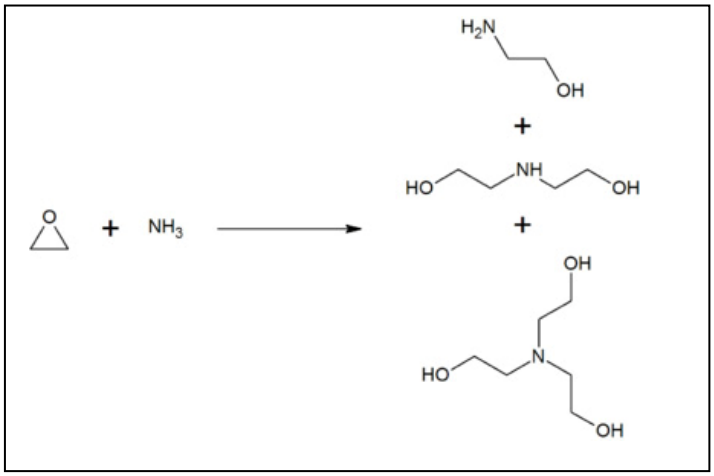
Synonyms:

- 1-Amino-2-hydroxyethane
- 2-Amino-1-ethanol
- 2-AMINOAETHANOL
- 2-aminoetanol
- 2-Aminoethanol
- 2-aminoethanol C2H7NO
- 2-Aminoethanol(clariant)
- 2-Aminoethyl alcohol
- 2-Ethanolamine
- 2-hydroxy ethylamine
- 2-Hydroxyethanamine
- 2-Hydroxyethylamine
- Aminoethanol
- Colamine
- Envision Conditioner PDD 9020
- ETA
- Ethanol, 2-amino
- Ethanol, 2-amino-
- ETHANOLAMINE
- Ethanolamine, Pure
- ETHYLAMINE COLAMINE
- Ethylolamine
- Glycinol
- MEA
- MEA (alcohol)
- Mealan
- MEA-LCI
- Mono Ethanol Amine
- Monoethanolamine
- Olamine
- Seramine
- UN 2491
- UN 2491
- β-Aminoethanol
- β-Aminoethyl alcohol
- β-Ethanolamine
- β-Hydroxyethylamine

Monoethanolamine (often abbreviated as **ETA** or **MEA**), is an organic chemical compoundthat is both a primary amine (due to an amino group in its molecule) and a primary alcohol (due to a hydroxyl group). Like other amines, monoethanolamine acts as a weak base. Ethanolamine is
a toxic, flammable, corrosive, colorless, viscous liquid with an odor similar to that of ammonia.

Production

Monoethanolamine is produced by reacting ethylene oxide with aqueous ammonia; the reaction also produces diethanolamine and triethanolamine. The ratio of the products can be controlled by changing the stoichiometry of the reactants.



Physical and Chemical Properties

Appearance: Clear, colorless liquid.
Odor: Ammonia odor.
Solubility: Miscible in water.
Density: 1.02
pH: 12.1 (25% solution)
% Volatiles by volume @ 21C (70F): No information found.
Boiling Point: 170C (338F)
Melting Point: 10C (50F)
Vapor Density (Air=1): 2.10
Vapor Pressure (mm Hg): 0.4 @ 20C (68F)
Evaporation Rate (BuAc=1): < 1

Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage. Hygroscopic. Absorbs carbon dioxide. A strong base.
Hazardous Decomposition Products:
Burning may produce carbon monoxide, carbon dioxide, nitrogen oxides.
Hazardous Polymerization:
Will not occur.
Incompatibilities:

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Sulfuric acid, hydrochloric acid, acetic acid, carbon dioxide in the air, copper, copper alloys, galvanized iron, aluminum, acetic anhydride, acrolein, acrylic acid, acrylonitrile, chlorosulfonic acid, epichlorohydrin, hydrofluoric acid, mesityl oxide, nitric acid, oleum, beta-propiolactone, and vinyl acetate.

Conditions to Avoid:

Heat, flame, other sources of ignition.

Hazards Identification

Emergency Overview

DANGER! CAUSES BURNS. COMBUSTIBLE. HARMFUL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN. AFFECTS CENTRAL NERVOUS SYSTEM.

Health Rating: 3 - Severe
Flammability Rating: 2 - Moderate
Reactivity Rating: 2 - Moderate
Contact Rating: 4 - Extreme (Corrosive)
Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES; CLASS B EXTINGUISHER
Storage Color Code: White (Corrosive)

Potential Health Effects

Inhalation:

Vapor may cause irritation to the respiratory tract. Symptoms may include sore throat, coughing, respiratory distress, headache, lethargy, and narcosis. Exposure to higher concentrations may cause pulmonary irritation, and kidney and liver damage.

Ingestion:

May cause mucosal burns of the mouth and esophagus, abdominal pain, nausea, and vomiting. May cause systemic poisoning with symptoms paralleling inhalation.

Skin Contact:

May cause irritation, redness, burns, and pain. May be absorbed through the skin; symptoms may parallel inhalation.

Eye Contact:

Vapors and contact may cause severe irritation, burns, redness, pain, and blurred vision.

Chronic Exposure:

Prolonged or repeated skin exposure may cause severe irritation or dermatitis.

Aggravation of Pre-existing Conditions:

Persons with pre-existing skin disorders or impaired liver, kidney, and pulmonary function may be more susceptible to the effects of this material.

First Aid Measures

Inhalation:

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

Ingestion:

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Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Call a physician immediately.

Skin Contact:

In case of contact, immediately flush skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. Call a physician.

Eye Contact:

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

Fire Fighting Measures

Fire:

Flash point: 85C (185F) CC
Autoignition temperature: 410C (770F)
Flammable limits in air % by volume:
lel: 5.5; uel: 17
Combustible.

Explosion:

Above flash point, vapor-air mixtures are explosive within flammable limits noted above.

Fire Extinguishing Media:

Water spray, dry chemical, alcohol foam, or carbon dioxide. Water spray may be used to keep fire exposed containers cool. Water may be used to flush spills away from exposures and to dilute spills to non-flammable mixtures.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

Accidental Release Measures

Ventilate area of leak or spill. Remove all sources of ignition. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Use non-sparking tools and equipment. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer!

Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from any source of heat or ignition. Isolate from oxidizing materials. Avoid contact with copper and copper alloys. Material is suitably handled in stainless steel equipment. Do not use aluminum for storage of aqueous solutions. Outside or detached storage is preferred. Isolate from acidic materials. Monoethanolamine is generally stored in plain steel equipment. Product may solidify at room temperature. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

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Exposure Controls/Personal Protection

Airborne Exposure Limits:
2-Aminoethanol:
-ACGIH Threshold Limit Value (TLV):
3 ppm (TWA) 6 ppm (STEL)
Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
Personal Respirators (NIOSH Approved):
If the exposure limit is exceeded and engineering controls are not feasible, a full facepiece respirator with organic vapor cartridge may be worn up to 50 times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air purifying respirators do not protect workers in oxygen-deficient atmospheres.
Skin Protection:
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.
Eye Protection:
Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

Ecological Information

Environmental Fate:
When released into the soil, this material may biodegrade to a moderate extent. When released into the soil, this material may leach into groundwater. When released into water, this material may biodegrade to a moderate extent. This material has an estimated bioconcentration factor (BCF) of less than 100. This material is not expected to significantly bioaccumulate. When released into the air, this material is expected to be readily degraded by reaction with photochemically produced hydroxyl radicals. When released into the air, this material is expected to have a half-life of less than 1 day. When released into the air, this material may be removed from the atmosphere to a moderate extent by wet deposition.
Environmental Toxicity:
No information found.

Other Information

NFPA Ratings: Health: **3** Flammability: **2** Reactivity: **0**
Label Hazard Warning:
DANGER! CAUSES BURNS. COMBUSTIBLE. HARMFUL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN. AFFECTS CENTRAL NERVOUS SYSTEM.
Label Precautions:
Do not get in eyes, on skin, or on clothing.
Do not breathe vapor.
Keep container closed.
Use with adequate ventilation.

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Wash thoroughly after handling.
Keep away from heat and flame.

Label First Aid:

If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. In all cases call a physician.

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