Product Safety Assessment

VERSENE™ HEIDA Chelating Agent


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Names
- CAS No. 135-37-5
- Disodium hydroxyethyliminodiacetate
- Disodium HEIDA
- Disodium ethanoldiglycine
- Sodium EDG
- VERSENE™ HEIDA chelating agent
- XUS-40855.01 developmental chelating agent
- Glycine, N-(carboxymethyl)-N-(2-hydroxyethyl)-, sodium salt (1:2)
- 2-Hydroxyethyliminodiacetate acid, disodium salt
- Glycine, N-(carboxymethyl)-N-(2-hydroxyethyl)-, di

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Product Overview
- VERSENE™ HEIDA chelating agent is a colorless to yellow liquid with an amine odor. The active ingredient is disodium ethanoldiglycine. For further details, see Product Description.
- VERSENE HEIDA chelating agent is used in applications such as cleaning products, oil-field chemicals, and water-treatment chemicals for the removal and prevention of scale. For further details, see Product Uses.
- Exposure to VERSENE HEIDA chelating agent can occur either in facilities that manufacture this product or in the various industrial or manufacturing facilities that use this product. Direct consumer contact is possible through contact with cleaning products. For further details, see Exposure Potential.
- Eye contact may cause moderate irritation and slight corneal injury. Prolonged or repeated skin contact may cause severe irritation with local redness, discomfort, or burns. Swallowing may result in irritation or burns to the mouth, throat, and gastrointestinal tract. This product contains a component that, in animal testing, has been reported to affect the kidneys. For further details, see Health Information.
- VERSENE HEIDA chelating agent is readily biodegradable, unlikely to accumulate in the food chain (bioconcentration potential is low), and is slightly toxic to aquatic organisms on an acute basis. For further details, see Environmental Information.
- VERSENE HEIDA chelating agent is stable at normal storage and recommended use temperatures, but can decompose at elevated temperatures. Avoid contact with aluminum, copper, and nickel. For further details, see Physical Hazard Information.

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Manufacture of Product

- **Location** – The Dow Chemical Company and its global affiliates manufacture disodium ethanoldiglycine, the active ingredient in VERSENE™ HEIDA chelating agent, at facilities in Seal Sands, United Kingdom.
- **Process** – Disodium ethanoldiglycine is manufactured by the carboxymethylation of monoethanolamine. The structure for disodium ethanoldiglycine is shown below.

\[
\text{HOCH}_2\text{CH}_2\text{N(CH}_2\text{COONa)}_2, \text{C}_6\text{H}_9\text{O}_5\text{NNa}_2
\]

Product Description

VERSENE™ HEIDA chelating agent is a colorless to yellow liquid with an amine odor. The active ingredient in this water-based product is disodium ethanoldiglycine, which is present at 27 to 29 percent.

Product Uses

VERSENE™ HEIDA chelating agent is used to remove and prevent scale in the following applications:

- **Cleaning products** – in household, industrial, and institutional cleaning products, such as hard-surface cleaners
- **Oil-field applications** – during drilling, production, and recovery of oil
- **Scale removal and prevention** – to clean calcium and other types of scale from boilers, evaporators, heat exchangers, filter cloths, and glass-lined kettles
- **Water treatment (hardness control)** – to control scale-forming calcium and magnesium in open circulating/cooling systems

Exposure Potential

VERSENE™ HEIDA chelating agent is used in the production of industrial and consumer products. Based on the uses for this product, the public could be exposed through:

- **Workplace exposure** – Exposure can occur either in facilities that manufacture VERSENE HEIDA chelating agent or in the various industrial or manufacturing facilities that use this product. It is produced, transported, and stored in closed containers until time for use. Those working with VERSENE HEIDA chelating agent in manufacturing operations could be exposed during maintenance, sampling, testing, or other procedures. Each manufacturing facility should have a thorough training program for employees and appropriate work processes, ventilation, and safety equipment in place to limit exposure. See Health Information.
- **Consumer exposure to products containing VERSENE HEIDA chelating agent** – Dow does not sell this product for consumer use. However, this product may be used to produce finished goods for consumers, such as cleaning products. VERSENE HEIDA chelating agent is not considered a risk to consumers. See Health Information.
- **Environmental releases** – VERSENE HEIDA chelating agent may be released into the environment during use. Due to its high water solubility, the compound will partition to water. Because the compound is readily biodegradable, it will likely be removed in biological wastewater treatment facilities as well as other water and soil environments. In the event of a spill, the focus is on containing the spill to prevent contamination of soil, surface water, or groundwater. Small spills should be absorbed with sand or soil. See Environmental, Health, and Physical Hazard Information.
- **Large release** – Industrial spills or releases are infrequent and generally contained. If a large spill does occur, VERSENE HEIDA chelating agent should be captured, collected, and reprocessed or disposed of according to applicable governmental requirements. An approved positive-pressure, self-contained breathing apparatus (SCBA) with a full-face mask is recommended for emergency work. See Environmental, Health, and Physical Hazard Information.
- **In case of fire** – This product will not burn until evaporated to dryness. The residue is combustible. Isolate the fire and deny unnecessary entry into the area. Keep people away. Use water fog, carbon-dioxide or dry-chemical extinguishers, or foam to fight
the fire. Firefighters should wear positive-pressure, self-contained breathing apparatus (SCBA) and protective firefighting clothing. Follow emergency procedures carefully. See Environmental, Health, and Physical Hazard Information.

For more information, see the relevant Safety Data Sheet.

Health Information

Eye contact – Contact may cause moderate irritation and slight corneal injury.

Skin contact – Prolonged contact is unlikely to result in absorption of harmful amounts. Prolonged contact may cause severe irritation with local redness and discomfort. Repeated contact may cause burns with pain, severe local redness, swelling, and tissue damage. A more severe response may result if the skin is abraded or covered (underneath clothing or gloves).

Inhalation – Vapors are primarily water; a single exposure is not likely to be hazardous. Mist may cause irritation of the upper respiratory tract (nose and throat).

Ingestion – Low toxicity if swallowed; however, swallowing may result in irritation or burns to the mouth, throat, and gastrointestinal tract. Aspiration into the lungs may occur during ingestion or vomiting, causing tissue damage or lung injury.

Repeated exposure – This product contains a component that, in animal testing, has been reported to affect the kidney. This effect may be associated with zinc deficiency due to chelation and occurred at doses many times higher than typical use concentrations.

Other – Sodium nitrilotriacetate monohydrate (NTA), a minor component in some of these products, causes urinary tumors in laboratory animals ingesting large doses. However, its relevance to humans is unknown.

For more information, see the relevant Safety Data Sheet.

Environmental Information

VERSENEM HEIDA chelating agent is water soluble and nonvolatile. If released to the environment, the compound will have a tendency to remain in water with minimal tendency to bind to soil or sediment.

VERSENEM HEIDA chelating agent is unlikely to persist in the environment. The compound is readily biodegradable, which suggests that it will likely be removed in biological wastewater treatment facilities as well as other water and soil environments.

VERSENEM HEIDA chelating agent is not likely to accumulate in the food chain (bioconcentration potential is low) and is slightly toxic to aquatic organisms on an acute basis (LC50/EC50 between 10 and 100 mg/L in the most sensitive species tested).

For more information, see the relevant Safety Data Sheet.

Physical Hazard Information

VERSENEM HEIDA chelating agent is stable at normal storage and recommended use temperatures, but can decompose at elevated temperatures. Avoid contact with aluminum and its alloys, copper and its alloys, and nickel. Hydrogen may be released from contact with zinc or aluminum.

For more information, see the relevant Safety Data Sheet.
Regulatory Information
Regulations may exist that govern the manufacture, sale, transportation, use, and/or disposal of VERSENE™ HEIDA chelating agent. These regulations may vary by city, state, country, or geographic region. Information may be found by consulting the relevant Safety Data Sheet, Technical Data Sheet, or Contact Us.

Additional Information
- Safety Data Sheet (www.dow.com/webapps/msds/msdssearch.aspx)
- Contact Us (www.dow.com/versene/contact/)
- Ecological Categorization Results from the Canadian Domestic Substance List, OECD, website accessed on December 12, 2012 (http://webnet.oecd.org/ccrweb/ChemicalDetails.aspx?ChemicalID=07394FD9-4AE0-4337-A13C-77DCF82E981A)

For more business information about VERSENE™ HEIDA chelating agent, visit the Dow VERSENE™ Chelating Agents web site at www.dow.com/versene/.

References
5 XUS 40855.01 Developmental Chelating Agent Material Safety Data Sheet, The Dow Chemical Company, March 4, 2011, Ecological Information.
10 XUS 40855.01 Developmental Chelating Agent Material Safety Data Sheet, The Dow Chemical Company, March 4, 2011, Hazards Identification and Toxicological Information.
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