

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Dissolvine® D-Fe-6
Chemical Name: Iron, N,N-bis[2-[bis(carboxymethyl)amino]ethyl]glycine diammonium complex (in water)
Synonym: Diethylenetriaminepentaacetic acid (DTPA), ferric diammonium complex
C.A.S. Registry No.: 85959-68-8
Chemical Formula: C₁₄ H₁₈ N₃ O₁₀ Fe(NH₄)₂
Product Use: Plant nutrient

Manufacturer / Supplier

Akzo Nobel Functional Chemicals LLC
Chelates Americas
525 West Van Buren St., Chicago, IL 60607
Tel. 1-800-906-7979

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)
- **CANUTEC (Canada):** (613) 996-6666

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

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2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

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

WARNING !

- **Corrosive to aluminum and steel.**
- **May cause eye, skin and respiratory tract irritation.**
- **Possible Development Hazard – Contains material (DTPA) that may adversely affect the developing fetus based on animal data.**

Appearance and odor: Red-brown liquid with a slight ammonia odor.

POTENTIAL HEALTH EFFECTS (See section 11 for additional information)

Primary Route(s) of Exposure: Skin contact, eye contact and inhalation.

Acute Exposure

- **Inhalation:** Exposure to an excessive concentration of vapor, mist, fumes or aerosol may cause respiratory tract discomfort and irritate the mucous membranes.
- **Skin Contact:** Skin contact may cause irritation.
- **Eye Contact:** Eye contact may cause irritation.
- **Ingestion:** If swallowed, this product may cause irritation of the mouth, throat and digestive tract.

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

2. HAZARDS IDENTIFICATION (CONTINUED)

Medical conditions aggravated: Zinc deficiency may be aggravated by systemic exposure to DTPA and its sodium salts.

Chronic Effect / Developmental: May adversely affect the developing fetus, based on animal data with a related product.

POTENTIAL ENVIRONMENTAL EFFECTS [See section 12 for additional information]

This product is not expected to be harmful to aquatic life, based on data with related materials.

3. COMPOSITION / INFORMATION ON INGREDIENTS

<u>INGREDIENTS</u> [See section 8 for exposure limits]	<u>% (w/w)</u>	<u>CAS Number</u>
DTPA, ferric diammonium complex	51.0 – 55.0	85959-68-8
Water	42.7 – 47.7	7732-18-5
DTPA Triammonium salt	0.3 – 2.3	Not assigned

4. FIRST AID MEASURES

Inhalation: Remove victim to fresh air. If breathing becomes difficult, oxygen may be given, preferably under physician's advice. If breathing has stopped, give artificial respiration. Get medical attention.

Skin Contact: Remove contaminated clothing, shoes and equipment. Wash all affected areas with soap and plenty of water for at least 15 minutes. Do not attempt to neutralize with chemical agents. Wash contaminated clothing and shoes before reuse. Get medical attention if irritation occurs or persists.

Eye Contact: Flush eyes with large quantities of running water for a minimum of 15 minutes. If easy to do, remove contact lenses, if worn. 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. Get medical attention if eye irritation occurs.

Ingestion: Call a physician immediately. ONLY induce vomiting at the instructions of a physician. If victim is conscious, rinse mouth and give water to drink. Never give anything by mouth to an unconscious person.

Note to Physician: Attending physician should treat exposed patients symptomatically.

5. FIRE FIGHTING MEASURES

Conditions of Flammability:	not flammable or combustible
Flash Point (Method):	not applicable
Upper Flammable Limit (% by volume):	not determined
Lower Flammable Limit (% by volume):	not determined
Auto-Ignition Temperature:	not determined

Extinguishing Media: Use water fog or spray, dry chemical, foam or carbon dioxide extinguishing agents.

Fire Fighting Procedures: 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.

Fire & Explosion Hazards: This product is not defined as flammable or combustible and should not be a fire hazard. Under fire conditions, it does not contribute any unusual hazards.

Hazardous Combustion Products: Thermal decomposition products may release toxic and/or hazardous fumes and gases, including nitrogen oxides and carbon oxides.

5. FIRE FIGHTING MEASURES (CONTINUED)

NFPA Hazard Rating – Health: 1 Fire: 0 Instability: 0 Other: None

[0 – Minimal 1 - Slight 2 - Moderate 3 - High 4 - Extreme]

6. ACCIDENTAL RELEASE MEASURES

Spill/Leak: Safely stop source of spill. Dike area to prevent spill from spreading. Restrict non-essential personnel from area. All personnel involved in spill cleanup should avoid skin and eye contact by wearing appropriate personal protective equipment.

Cleanup: Soak up liquid with a suitable absorbent such as clay, sawdust or kitty litter. Sweep up absorbed material and place in a chemical waste container for disposal according to local, state or federal regulations. Then flush area with water.

7. HANDLING AND STORAGE

Handling: Wear appropriate personal protective equipment. Avoid inhalation and prolonged and/or repeated skin and eye contact.

Storage: Keep containers closed and dry. This material is suitable for any general chemical storage area. Isolate from incompatible materials such as strong oxidizing agents. Store in original packing or in PVC, PE or bituminized tanks. Avoid contact with aluminum, copper, copper alloys, nickel and zinc.

Maximum Storage Temperature: Store in a cool and dry place (below 25°C / 77°F). Do not store below crystallization temperature (- 10°C / 14°F).

General Comments: Containers should not be opened until ready for use. Exposure to sunlight may cause degradation of the product. It is recommended to re-test the product after two years of storage.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Limits:

Chemical Name	OSHA – PELs (mg / m ³)		ACGIH – TLVs (mg / m ³)		NIOSH – RELs (mg / m ³)		AIHA – WEELs (mg / m ³)	
	TWA	STEL / CEIL(C)	TWA	STEL / CEIL(C)	TWA	STEL / CEIL(C)	TWA	STEL / CEIL(C)
DTPA, ferric diammonium complex	N/D	N/D	N/D	N/D	N/D	N/D	N/D	N/D
Water	N/D	N/D	N/D	N/D	N/D	N/D	N/D	N/D
DTPA triammonium salt	N/D	N/D	N/D	N/D	N/D	N/D	N/D	N/D

[Ref: ACGIH Guide to Occupational Exposure Values, 2008 Edition]

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

PEL : Permissible Exposure Limit

TLV : Threshold Limit Value

WEEL: Workplace Environmental Exposure Level

REL: Recommended Exposure Limit

TWA : Time-Weighted Average

Engineering Controls – Ventilation: Special ventilation is usually not required under normal use conditions. Ensure that existing ventilation is sufficient to prevent the circulation and/or accumulation of vapor in the air.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION (CONTINUED)

Personal Protective Equipment (PPE)

- **Respiratory Protection:** Use of respiratory protection is generally not required. 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 respirator with dust, mist and fume filters 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.
- **Skin Protection:** Skin contact with the product should be minimized through the use of suitable protective clothing, gloves and footwear selected according to use condition exposure potential.
- **Eye Protection:** Since eye contact may cause irritation, chemical goggles and/or a face shield should be worn when handling this product.

Other Protection: 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. 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-ups in cold weather.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State / Appearance / Odor:	red-brown liquid with a slight ammonia odor at 25°C (77°F)
Boiling Point:	≈ 212°F (100°C) (water)
Bulk Density:	not applicable
Cloud Point:	not determined
Evaporation Rate (Butyl Acetate=1):	not determined
Melting Point:	< 14°F (- 10°C) (crystallization point /range)
Odor Threshold:	not determined
pH:	6 – 7 (1% solution)
Partition Coefficient (n-octanol/water):	Log P _{ow} < 0
Pour Point:	not determined
Solubility in water:	completely miscible
Solubility in other solvents:	not determined
Specific Gravity (H ₂ O = 1):	≈ 1.30
Vapor Density (Air = 1):	same as water
Vapor Pressure:	same as water
Viscosity:	not determined
Volatiles (% by weight):	not determined
Other – Decomposition temperature:	≈ 212°F (100°C) for water loss
Conditions of Flammability:	not flammable or combustible
Flash Point (Method):	not applicable
Upper Flammable Limit (% by volume):	not applicable
Lower Flammable Limit (% by volume):	not applicable
Auto-ignition Temperature:	not applicable

< : less than > : greater than ≈ : approximately

10. STABILITY AND REACTIVITY

Stability: This product is stable at ambient temperatures and atmospheric pressures. It is not self-reactive and is not sensitive to physical impact.

Polymerization: Hazardous polymerization is not expected to occur under normal temperatures and pressures.

10. STABILITY AND REACTIVITY (CONTINUED)

Incompatibilities / Conditions to avoid: This product is incompatible with strong oxidizers. Avoid contact with aluminum, nickel, zinc, copper and copper alloys. To ensure product integrity, do not expose product to temperatures above 212°F (100°C) for extended periods of time.

Decomposition Products: Under fire conditions the product may support combustion and decomposes to give off carbon oxides fumes (CO, CO₂), nitrogen oxides and water vapor.

11. TOXICOLOGICAL INFORMATION

INHALATION

Acute exposure: The acute LC₅₀ for this product is not available.

Chronic exposure: No data available.

SKIN

Acute contact: Dermal toxicity for this product is not available. However, it may cause skin irritation based on tests with related DTPA products.

Chronic contact: No data available.

EYES: This product is expected to be irritating to rabbit eyes, based on tests with related DTPA products.

INGESTION

Acute exposure: The oral LD₅₀ is expected to be greater than 2,000 mg/kg (rat), based on structurally related products.

Chronic exposure: No data available.

SENSITIZATION: No data available for the mixture. Other DTPA salts were not sensitizing in animal tests.

CARCINOGENICITY: IARC, NTP, ACGIH and OSHA do not classify this material as a carcinogen or suspect carcinogen.

MUTAGENICITY: No data available for this product. Other DTPA salts were not mutagenic in the Ames Assay.

REPRODUCTIVE TOXICITY: The following data is available for a related product, Pentasodium DTPA (Na₅DTPA): "A maternally non-toxic dose (400 mg/kg) of a test article with 40% Na₅DTPA, administered orally to pregnant rats, caused a significant increase in skeletal retardations in the developing fetuses. In the presence of maternal toxicity, a dose of 1000 mg/kg caused a statistically significant increase in skeletal malformations, variations, and retardations in rat fetuses. These effects may be due to zinc deficiency caused by chelation of zinc by Na₅DTPA."

TARGET ORGANS: Skin, eyes.

12. ECOLOGICAL INFORMATION

Ecotoxicity: No data available on the mixture. The LC₅₀ (24/48-hr) of a related product (Ferric disodium DTPA) for *Daphnia carinata* is greater than 1000 mg/L.

Biodegradation: This product is not expected to be readily biodegradable (based on tests with structurally related products).

Other Ecotoxicity information: Bioaccumulation: Log P_{ow} = < 0 (based on structurally related product)

13. DISPOSAL CONSIDERATIONS

Waste Disposal: In its unused condition, this product is not considered to be a RCRA-defined hazardous waste by characteristics or listings. It is the responsibility of the waste generator to evaluate whether his wastes are hazardous by characteristic or listing. Dispose in accordance with all local, state and federal regulations.

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

Container Disposal: Containers should be cleaned of residual product before disposal or return. Since emptied containers retain product residue, follow label warnings even after container is emptied. Empty containers should be disposed of or shipped in accordance with all applicable laws and regulations.

14. TRANSPORT INFORMATION

Shipping Information:

US DOT	Domestic Land Shipments (motor vehicle or rail car): This product is <i>not regulated</i> as hazardous substance by DOT, per 49CFR §173.154 (d) exception for materials corrosive to metals (steel and/or aluminum).
CANADA – TDG IMDG / IATA / ICAO	Corrosive liquid, n.o.s. (Diethylenetriaminepentaacetic acid ferric diammonium complex) UN1760, 8, PG III

2008 Emergency Response Guidebook (ERG) No.: 154

Required Labels:

- Domestic land shipments: No transport label required
- Air / Water / International shipments: Corrosive labels required

Environmentally Hazardous Substances [49 CFR 172.101, Appendix A]: None

15. REGULATORY INFORMATION

The components are subject to the following environmental regulatory lists:

Substance Name	CAA	CERCLA	IARC	US STATE RIGHT-TO-KNOW LISTS	CA PROP 65	SARA
DTPA, ferric diammonium complex	N/R	N/R	N/R	N/R	N/R	N/R
Water	N/R	N/R	N/R	N/R	N/R	N/R
DTPA triammonium salt	N/R	N/R	N/R	N/R	N/R	N/R

National Chemical Inventories Status:

Substance Name	US TSCA	Canada		EU EINECS	Australia AICS	New Zealand NZIoC	Japan ENCS	Korea KECI	Philippines PICCS	China IECSC
		DSL	NDSL							
DTPA, ferric diammonium complex	X		X (see note 1)	X	X	X	X	X	X	X
DTPA triammonium salt										
Water	X	X		X	X	X	X	X	X	X

¹ Exempt from CEPA New Substances Notifications if registered as micronutrient under the Fertilizers Act in Canada and sold in Canada only for that use.

N/R = Non Regulated

X = Listed / Regulated

15. REGULATORY INFORMATION (CONTINUED)

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 and Evaluated Chemical Substances
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 D2B [Material causing Other Toxic Effects]

Class E [Corrosive to aluminum and steel]

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.

- **Micronutrient Registration - Canadian Food Inspection Agency (CFIA):** Dissolvine D-FE-6 is a registered micronutrient in Canada under the Fertilizers Act [Registration Number 990058B]

16. OTHER INFORMATION

HMIS RATING – Health: 1 **Flammability:** 0 **Physical hazards:** 0 **Other:** none
[0 – Minimal 1 - Slight 2 - Moderate 3 - High 4 - Extreme * - Chronic Health Hazard (see Section 11)]

Other Information: Dissolvine® is a registered trademark of Akzo Nobel Chemicals B.V.

Changes: Sections 15, 16 / Logo / Format

Prepared by: AkzoNobel [Technology & Engineering (Regulatory Toxicology)] / Tel. 613.273.8095

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