Akzo Nobel Functional Chemicals LLC
MATERIAL SAFETY DATA SHEET
Dissolvine® GL-47-S

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name	**Dissolvine® GL-47-S**
Chemical Name	Tetrasodium *N,N*-bis(carboxymethyl)-L-glutamate
Synonym(s)	L-Glutamic acid, *N,N*-diacetic acid tetrasodium salt (GLDA-Na_4)
Product Use	Chelating agent
Manufacturer / Supplier	Akzo Nobel Functional Chemicals LLC Chelates Americas 525 West Van Buren St., Chicago, IL, USA 60607 Tel. (800) 906-7979 ***www.dissolvinegl.com***

Emergency Telephone Numbers

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
MEDICAL / HANDLING EMERGENCIES	(914) 693-6946 [AkzoNobel – USA]	

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

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

WARNING !

- **May cause eye and respiratory tract irritation.**
- **Corrosive to metal.**

Appearance and odor Pale yellow liquid with a slight ammonia odor.

POTENTIAL HEALTH EFFECTS *[See Section 11 for additional information]*

Primary Route(s) of Exposure	Eye contact, skin contact and inhalation
Acute Exposure	
Inhalation	Exposure to an excessive concentration of vapors, mist, fumes or aerosols may cause respiratory tract discomfort and/or mild irritation.
Skin Contact	Skin contact is not expected to cause irritation.
Eye Contact	Eye contact may cause mild irritation.
Ingestion	This product is expected to have a low order of acute toxicity.
Carcinogenicity	IARC, NTP, ACGIH and OSHA do not classify this material as a carcinogen or suspect carcinogen.
Medical conditions aggravated by exposure	There are no data available that address medical conditions that are generally recognized as being aggravated by exposure to this product.

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

Aquatic Toxicity	This product is not expected to be harmful to aquatic life, based on available data.

3. Composition / Information on Ingredients

INGREDIENTS	CAS Number	% (w/w)
L-Glutamic acid, *N,N*-diacetic acid tetrasodium salt (GLDA-Na_4)	51981-21-6	47 - 49
Sodium hydroxide	1310-73-2	0.5 - 1.9
Water	7732-18-5	Balance

4. First Aid Measures

Inhalation Remove victim to fresh air. If irritation occurs or if breathing becomes difficult, get medical attention.

Skin Contact Remove contaminated clothing, shoes and equipment. Wash all affected areas with soap and plenty of water. 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 the victim is wearing contact lenses, remove them. 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 Give several glasses of water. DO NOT induce vomiting. 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. Get medical attention if health effects occur.

Note to Physician Attending physician should treat exposed patients symptomatically.

5. Fire Fighting Measures

Flammable properties Not flammable or combustible

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 may produce irritating fumes and/or gases if heated to 600°C (1112° F) or above.

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

6. Accidental Release Measures

Personal precautions All personnel involved in spill cleanup should avoid skin and eye contact by wearing appropriate personal protective equipment (See Section 8).

Methods for containment Safely stop source of spill. Dike area to prevent spill from spreading. Restrict non-essential personnel from area.

Environmental precautions Collect as much as possible in a clean container for reuse (if not contaminated) or disposal (if contaminated).

Methods for clean-up Soak up liquid residue with a suitable absorbent such as clay, sawdust or kitty litter. Sweep up absorbed material and place in a chemical waste container for disposal. Then flush area with water. CAUTION – The spill area may be slippery.

Other information See also Section 13 for disposal information.

7. Handling and Storage

Handling Avoid inhalation of vapors or fumes as well as 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 PVC, PE, stainless steel or bituminized tanks. Avoid contact with aluminum, copper, copper alloys, nickel and zinc.

Recommended Storage Temperature Store in a cool and dry place at ambient temperature (below 25°C / 77°F).

General Comments Containers should not be opened until ready for use. Opened containers must be closed again properly. It is advised to re-test the product after three years of storage.

8. Exposure Controls / Personal Protection

Exposure Guidelines Other than any exposure limits which may be displayed below, there are no other known exposure limits applicable to this product or its components.

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)
L-Glutamic acid, *N,N*-diacetic acid tetrasodium salt	N/D	N/D	N/D	N/D	N/D	N/D	N/D	N/D
Sodium hydroxide	**2.0**	N/D	N/D	**2.0 (C)**	N/D	**2.0 (C)**	N/D	N/D
Water	N/D	N/D	N/D	N/D	N/D	N/D	N/D	N/D

[Ref: ACGIH Guide to Occupational Exposure Values, 2009 Edition]

Legend:
CEIL: Ceiling Exposure Limit
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit
STEL: Short Term Exposure Limit
TLV: Threshold Limit Value
TWA: Time-Weighted Average
N/D: Not Determined
WEEL: Workplace Environmental Exposure Level
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

IDLH
*[**I**mmediately **D**angerous to **L**ife or **H**ealth Concentrations (NIOSH)]*
Sodium hydroxide = 10 mg/m^3

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 vapors in the air.

Personal Protective Equipment (PPE)

Respiratory Use of respiratory protection is generally not required. However, if use conditions generate vapors, aerosols or fumes and adequate ventilation (e.g., outdoor or well-ventilated area) is not available, use a NIOSH-approved organic vapor respirator with HEPA (High Efficiency Particulate Air) 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 Skin contact with the product should be minimized or prevented through the use of suitable protective clothing, gloves and footwear selected according to use condition exposure potential. For permanent (>8 hours) full contact use, 100% Viton gloves are recommended.

Eyes/Face Since eye contact may cause irritation, chemical goggles and/or a face shield should be worn when handling this product.

8. Exposure Controls / Personal Protection (Continued)

Hygiene Measures	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

Appearance	
Form	liquid
Color	pale yellow
Odor	slight ammonia odor
Boiling Point	221-230°F (105-110°C)
Bulk Density	not applicable
Evaporation Rate ***(Butyl Acetate=1)***	not determined
Melting Point	< 5°F / < -15°C [crystallization point]
Odor Threshold	not determined
pH	11-12 (1% solution)
Partition Coefficient ***(n-octanol/water)***	Log P_{ow} < 0
Solubility in water	miscible
Solubility in other solvents	not determined
Specific Gravity	1.38 – 1.42
Vapor Density ***(Air = 1)***	same as water
Vapor Pressure	same as water
Viscosity	100-200 mPa.s (68°F / 20°C)
Volatiles ***(% by weight)***	not determined
Other	not determined
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

Chemical stability	This product is stable under recommended storage and handling conditions (see section 7). It is not self-reactive and is not sensitive to physical impact.
Conditions to avoid	Avoid contact with aluminum, nickel, zinc, copper and copper alloys.
Incompatible materials	This product is incompatible with strong oxidizers.
Hazardous decomposition products	Under fire conditions the product may support combustion and decomposes to give off carbon oxides fumes (CO, CO_2), nitrogen oxides and ammonia.
Possibility of hazardous reactions	Hazardous polymerization is not expected to occur under normal temperatures and pressures.

11. Toxicological Information

Inhalation - Acute The acute LC_{50} for this product is not available.

Inhalation - Chronic No known effects for the mixture.

Skin - Acute Dermal toxicity for this product is not available. A similar product containing 71% L-Glutamic acid, *N,N*-diacetic acid tetrasodium (GLDA-Na4) was not irritating to rabbit skin after a 4-hour exposure to 0.5 ml (164 mg). The Primary Irritation Index was 0.0.

Skin - Chronic No known effects for the mixture.

Eyes A similar product containing 71% GLDA-Na4 was minimally irritating to rabbit eyes following the instillation of 0.1 ml (31 mg). The maximum irritation score was 3.3.

Ingestion - Acute The oral LD_{50} is expected to be greater than 2,000 mg/kg (rat), based on tests with a similar product containing 71% GLDA-Na4.

Ingestion - Chronic In a 90-day oral gavage study, GLDA induced reversible changes in some blood and urine parameters without concomitant microscopic changes in the kidneys or other organs. The NOAEL is 300 mg/kg/day.

Sensitization A similar product containing 75% GLDA-Na4 was not sensitizing to guinea pig skin.

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

Mutagenicity A similar product containing 71% GLDA-Na4 was negative in the Ames, CHO HGPRT forward mutation and micronucleus tests. It was weakly clastogenic to CHL cells in vitro.

Other Effects None known.

Target Organs Eyes, kidney and bladder.

12. Ecological Information

Ecotoxicity Experiments on products containing 71-74% L-Glutamic acid, *N,N*-diacetic acid tetrasodium component (GLDA-Na4) yielded the following ecotoxicity data:

Test	Exposure / Duration	Test Results
Daphnia Magna	48-h	EC_{50} > 100 mg/L
Algae	72-h	EC_{50} > 100 mg/L
Rainbow Trout *(oncorhynchus mykiss)*	96-h	LC_{50} > 100 mg/L

Biodegradation GLDA-Na4 gave the following positive and negative results:

- Readily biodegradable [Closed Bottle Test and Test with inoculum from Maas & Rhine rivers]
- Inherently and ultimately biodegradable [Zahn-Wellens Test]
- Not readily biodegradable [Modified Sturm Test]
- Not biodegradable under anaerobic conditions

Bioaccumulation GLDA-Na4 has a Log Pow < 3

Other Ecotoxicity information GLDA-Na4 did not inhibit respiration in activated sludge.

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.

13. Disposal Considerations (Continued)

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

Regulatory Information	UN Number	Proper Shipping Name	Class	PG	Label	Additional Information
US DOT (Land)	**N/R**	**N/R**	**N/R**	**N/R**	**N/R**	This product is ***not regulated*** as hazardous by DOT, per 49CFR §173.154 (d) exception for materials corrosive to metals (steel and/or aluminum).
US DOT (Air) ***Canada TDG*** ***IMDG*** ***IATA / ICAO***	**UN3267**	***Corrosive liquid, basic, organic, n.o.s.*** *(Glutamic acid N,N-diacetic acid tetrasodium salt 47% solution , Sodium hydroxide)*	**8**	**III**	**Corrosive**	

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Environmentally Hazardous Substances
[49 CFR 172.101, Appendix A] Sodium hydroxide: RQ = 1000 lbs (454 kg)

15. Regulatory Information

Regulatory Lists / Inventories: The components are subject to the following regulatory lists and inventories:

Substance Name	CAA	CERCLA	IARC	US STATE RIGHT-TO-KNOW LISTS	CA PROP 65	SARA
L-Glutamic acid, *N,N*-diacetic acid tetrasodium	N/R	N/R	N/R	N/R	N/R	N/R
Sodium hydroxide	N/R	**X**	N/R	**CA / FL / IL / MA / MN / NJ / PA / RI**	N/R	N/R
Water	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							
L-Glutamic acid, *N,N*-diacetic acid tetrasodium	**X**	***X***		**X**	***X***	**X**	***X***	**X**	***X***	***X***
Sodium hydroxide	**X**	**X**		**X**	**X**	**X**	**X**	**X**	**X**	**X**
Water	**X**	**X**		**X**	**X**	**X**	**X**	**X**	**X**	**X**

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

15. REGULATORY INFORMATION (CONTINUED)

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
N/R	Non Regulated
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
X	Listed and/or Regulated

***CANADA – WHMIS* (W**orkplace **H**azardous **M**aterials **I**nformation **S**ystem**)**

Class E Corrosive to metal

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.

Other Regulatory Information None available.

16. OTHER INFORMATION

NFPA Rating **Health:** 1 / **Fire:** 0 / **Instability:** 0 / **Other:** None
[0 – Minimal / 1 – Slight / 2 - Moderate / 3 – High / 4 – Extreme]

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

Trademark Dissolvine® is a registered trademark of Akzo Nobel Chemicals B.V.

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Changes Section 15 [Chemical Inventories]

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