

NeXtal MPD Suite

Version 2.0

Revision Date 04/02/2020

Print Date 04/02/2020

SECTION 1. IDENTIFICATION

Product name : NeXtal MPD Suite

Manufacturer or supplier's details

Company : NeXtal
6201 Trust Dr
Holland, OH 43528
USA

Telephone : 419-740-6600

E-mail address : www.calibrescientific.com

Emergency telephone : CHEMTREC
USA & Canada 1-800-424-9300
Outside USA & Canada (703) 527-3887
Chemtrec ID# 696910

Recommended use of the chemical and restrictions on use

Recommended use : Laboratory chemicals

SECTION 2. HAZARDS IDENTIFICATION**GHS Classification**

Flammable liquids : Category 2

Acute toxicity (Oral) : Category 4

Acute toxicity (Inhalation) : Category 4

Skin irritation : Category 2

Serious eye damage : Category 1

Respiratory sensitization : Category 1

Skin sensitization : Category 1

Germ cell mutagenicity : Category 1B

Carcinogenicity : Category 1A

Reproductive toxicity : Category 1B

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Specific target organ systemic toxicity - single exposure : Category 3 (Respiratory system)

Specific target organ systemic toxicity - repeated exposure : Category 1

Acute aquatic toxicity : Category 1

Chronic aquatic toxicity : Category 1

GHS Label element

Hazard pictograms :



Signal Word : Danger

Hazard Statements :

- H225 Highly flammable liquid and vapor.
- H302 + H332 Harmful if swallowed or if inhaled.
- H315 Causes skin irritation.
- H317 May cause an allergic skin reaction.
- H318 Causes serious eye damage.
- H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
- H335 May cause respiratory irritation.
- H340 May cause genetic defects.
- H350 May cause cancer.
- H360 May damage fertility or the unborn child.
- H372 Causes damage to organs through prolonged or repeated exposure.
- H410 Very toxic to aquatic life with long lasting effects.

Precautionary Statements :

Prevention:

- P201 Obtain special instructions before use.
- P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
- P260 Do not breathe dust/fumes/gas/mist/vapors/spray.
- P280 Wear protective gloves/protective clothing/eye protection/face protection.
- P284 Wear respiratory protection.

Response:

- P304 + P340 + P312 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell.
- P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/physician.
- P308 + P313 IF exposed or concerned: Get medical advice/attention.

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Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Substance name : NeXtal MPD Suite

Hazardous ingredients

Chemical Name	CAS-No.	Concentration (% w/w)
2-methylpentane-2,4-diol	107-41-5	>= 50 - < 70
ethanol	64-17-5	>= 20 - < 30
PEG	25322-68-3	>= 1 - < 10
Zinc sulfate, heptahydrate (1:1:7)	7446-20-0	>= 1 - < 10
Lithium citrate tribasic tetrahydrate	6080-58-6	>= 1 - < 10
Magnesium nitrate, hexahydrate	13446-18-9	>= 1 - < 10
nickel chloride	7791-20-0	>= 1 - < 10
tri ammonium citrate	3458-72-8	>= 1 - < 10
Magnesium chloride, hexahydrate	7791-18-6	>= 1 - < 10
glycerol	56-81-5	>= 1 - < 10
cadmium chloride	10108-64-2	>= 1 - < 10
calcium acetate hydrate	114460-21-8	>= 1 - < 10
caesium chloride	7647-17-8	>= 1 - < 10
potassium iodide	7681-11-0	>= 1 - < 10
sodium iodide	7681-82-5	>= 1 - < 10
calcium chloride dihydrate	10035-04-8	>= 1 - < 10
ammonium iodide	12027-06-4	>= 1 - < 10
lithium sulfate, monohydrate	10102-25-7	>= 1 - < 10
potassium bromide	7758-02-3	>= 1 - < 10
4-Morpholineethanesulfonic acid	145224-94-8	>= 1 - < 10
2-methylpropan-2-ol	75-65-0	>= 1 - < 10
potassium nitrate	7757-79-1	>= 1 - < 10
potassium thiocyanate	333-20-0	>= 1 - < 10
citric acid	77-92-9	>= 1 - < 10
sodium nitrate	7631-99-4	>= 1 - < 10
sodium thiocyanate	540-72-7	>= 1 - < 10
ammonium nitrate	6484-52-2	>= 1 - < 10
lithium nitrate	7790-69-4	>= 1 - < 10
ammonium formate	540-69-2	>= 1 - < 10
potassium fluoride	7789-23-3	>= 1 - < 10
ammonium chloride	12125-02-9	>= 1 - < 10
Imidazole, monohydrochloride	1467-16-9	>= 1 - < 10
ammonium fluoride	12125-01-8	>= 0.1 - < 1

SECTION 4. FIRST AID MEASURES

General advice : Move out of dangerous area.
Show this material safety data sheet to the doctor in attendance.

If inhaled : Call a physician or poison control center immediately.

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	If unconscious place in recovery position and seek medical advice. Keep respiratory tract clear.
In case of skin contact	: Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. If symptoms persist, call a physician.
In case of eye contact	: Small amounts splashed into eyes can cause irreversible tissue damage and blindness. In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Remove contact lenses. Protect unharmed eye.
If swallowed	: If accidentally swallowed obtain immediate medical attention. Rinse mouth with water. Never give anything by mouth to an unconscious person.
Most important symptoms and effects, both acute and delayed	: No information available. Harmful if swallowed or if inhaled. Causes skin irritation. May cause an allergic skin reaction. Causes serious eye damage. May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause respiratory irritation. May cause genetic defects. May cause cancer. May damage fertility or the unborn child. Causes damage to organs through prolonged or repeated exposure.
Notes to physician	: No information available.

SECTION 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media	: Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.
Specific hazards during fire fighting	: Do not allow run-off from firefighting to enter drains or water courses. Exposure to decomposition products may be a hazard to health.
Hazardous combustion products	: Carbon oxides Carbon monoxide, carbon dioxide and unburned hydrocarbons (smoke). Nitrogen oxides (NOx) Sulfur oxides potassium oxide Metal oxides Magnesium oxides Chlorine compounds

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Iodine compounds
Hydrogen chloride gas
Bromine compounds
Fluorine compounds

Specific extinguishing methods : In the event of fire and/or explosion do not breathe fumes. Use a water spray to cool fully closed containers.

Special protective equipment for fire-fighters : Wear self-contained breathing apparatus for firefighting if necessary.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures : Use personal protective equipment.
Ensure adequate ventilation.
Remove all sources of ignition.
Evacuate personnel to safe areas.
Avoid breathing dust/fumes/gas/mist/vapors/spray.
Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas.

Environmental precautions : Prevent product from entering drains.
Prevent further leakage or spillage if safe to do so.

Methods and materials for containment and cleaning up : Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).
sodium hypochlorite

SECTION 7. HANDLING AND STORAGE

Advice on protection against fire and explosion : Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). Use only explosion-proof equipment. Keep away from open flames, hot surfaces and sources of ignition.

Advice on safe handling : Avoid formation of aerosol.
Do not breathe vapors/dust.
Avoid exposure - obtain special instructions before use.
Avoid contact with skin and eyes.
For personal protection see section 8.
Smoking, eating and drinking should be prohibited in the application area.
Provide sufficient air exchange and/or exhaust in work rooms.
Open drum carefully as content may be under pressure.
Dispose of rinse water in accordance with local and national regulations.
Persons susceptible to skin sensitization problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used.

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Conditions for safe storage : Keep container tightly closed in a dry and well-ventilated place.

Materials to avoid : Do not store together with oxidizing and self-igniting products.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION**Ingredients with workplace control parameters**

Ingredients	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
2-methylpentane-2,4-diol	107-41-5	C	25 ppm	ACGIH
		C	25 ppm 125 mg/m3	NIOSH REL
		C	25 ppm 125 mg/m3	OSHA P0
ethanol	64-17-5	TWA	1,000 ppm 1,900 mg/m3	NIOSH REL
		TWA	1,000 ppm 1,900 mg/m3	OSHA Z-1
		TWA	1,000 ppm 1,900 mg/m3	OSHA P0
		STEL	1,000 ppm	ACGIH
PEG	25322-68-3	TWA	10 mg/m3	US WEEL
		TWA (aerosol)	10 mg/m3	US WEEL
nickel chloride	7791-20-0	TWA	1 mg/m3 (Nickel)	OSHA Z-1
		TWA (Inhalable fraction)	0.1 mg/m3 (Nickel)	ACGIH
		TWA	0.1 mg/m3 (Nickel)	OSHA P0
		TWA	0.015 mg/m3 (Nickel)	NIOSH REL
		TWA	1 mg/m3 (Nickel)	OSHA Z-1
		TWA (Inhalable fraction)	0.1 mg/m3 (Nickel)	ACGIH
		TWA	0.1 mg/m3 (Nickel)	OSHA P0
		TWA	0.015 mg/m3 (Nickel)	NIOSH REL
glycerol	56-81-5	TWA (mist, respirable fraction)	5 mg/m3	OSHA Z-1
		TWA (mist, total dust)	15 mg/m3	OSHA Z-1
		TWA (Total)	10 mg/m3	OSHA P0
		TWA (Respirable)	5 mg/m3	OSHA P0

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		fraction)		
		TWA	10 mg/m3	ACGIH
		TWA (Mist - total dust)	10 mg/m3	OSHA P0
		TWA (Mist - respirable fraction)	5 mg/m3	OSHA P0
cadmium chloride	10108-64-2	TWA	0.01 mg/m3 (cadmium)	ACGIH
		TWA (Respirable fraction)	0.002 mg/m3 (cadmium)	ACGIH
		PEL	0.005 mg/m3	OSHA CARC
		TWA	0.01 mg/m3 (cadmium)	ACGIH
		TWA (Respirable fraction)	0.002 mg/m3 (cadmium)	ACGIH
		PEL	0.005 mg/m3 (cadmium)	OSHA CARC
potassium iodide	7681-11-0	TWA (Inhalable fraction and vapor)	0.01 mg/m3	ACGIH
		TWA (Inhalable fraction and vapor)	0.01 mg/m3	ACGIH
		TWA (Inhalable fraction and vapor)	0.01 ppm (iodine)	ACGIH
sodium iodide	7681-82-5	TWA (Inhalable fraction and vapor)	0.01 mg/m3	ACGIH
		TWA (Inhalable fraction and vapor)	0.01 ppm (iodine)	ACGIH
2-methylpropan-2-ol	75-65-0	TWA	100 ppm	ACGIH
		TWA	100 ppm 300 mg/m3	NIOSH REL
		ST	150 ppm 450 mg/m3	NIOSH REL
		TWA	100 ppm 300 mg/m3	OSHA Z-1
		TWA	100 ppm 300 mg/m3	OSHA P0
		STEL	150 ppm 450 mg/m3	OSHA P0
potassium fluoride	7789-23-3	TWA	2.5 mg/m3 (Fluorine)	OSHA Z-1
		TWA	2.5 mg/m3 (Fluorine)	ACGIH

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		TWA	2.5 mg/m3 (Fluorine)	OSHA P0
		TWA	2.5 mg/m3 (Fluorine)	OSHA Z-1
		TWA	2.5 mg/m3 (Fluorine)	ACGIH
		TWA	2.5 mg/m3 (Fluorine)	OSHA P0
ammonium chloride	12125-02-9	TWA	10 mg/m3	ACGIH
		STEL	20 mg/m3	ACGIH
		TWA (Fumes)	10 mg/m3	NIOSH REL
		ST (Fumes)	20 mg/m3	NIOSH REL
		TWA	10 mg/m3	OSHA P0
		STEL	20 mg/m3	OSHA P0
		TWA (Fumes)	10 mg/m3	ACGIH
		STEL (Fumes)	20 mg/m3	ACGIH
		TWA (Fumes)	10 mg/m3	NIOSH REL
		ST (Fumes)	20 mg/m3	NIOSH REL
ammonium fluoride	12125-01-8	TWA	2.5 mg/m3 (Fluorine)	OSHA Z-1
		TWA	2.5 mg/m3 (Fluorine)	ACGIH
		TWA	2.5 mg/m3 (Fluorine)	OSHA P0
		TWA	2.5 mg/m3 (Fluorine)	OSHA Z-1
		TWA	2.5 mg/m3 (Fluorine)	ACGIH
		TWA	2.5 mg/m3 (Fluorine)	OSHA P0

Hazardous components without workplace control parameters

Ingredients	CAS-No.
Zinc sulfate, heptahydrate (1:1:7)	7446-20-0
Lithium citrate tribasic tetrahydrate	6080-58-6
Magnesium nitrate, hexahydrate	13446-18-9
triammonium citrate	3458-72-8
Magnesium chloride, hexahydrate	7791-18-6
calcium acetate hydrate	114460-21-8
caesium chloride	7647-17-8
calcium chloride dihydrate	10035-04-8
ammonium iodide	12027-06-4
lithium sulfate, monohydrate	10102-25-7
potassium bromide	7758-02-3
4-Morpholineethanesulfonic acid	145224-94-8

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potassium nitrate	7757-79-1
potassium thiocyanate	333-20-0
citric acid	77-92-9
sodium nitrate	7631-99-4
sodium thiocyanate	540-72-7
ammonium nitrate	6484-52-2
lithium nitrate	7790-69-4
ammonium formate	540-69-2
Imidazole, monohydrochloride	1467-16-9

Biological occupational exposure limits

Ingredients	CAS-No.	Control parameters	Biological specimen	Sampling time	Permissible concentration	Basis
	10108-64-2	cadmium (cadmium)	In blood	Not critical	5 µg/l	ACGIH BEI
		cadmium (cadmium)	Urine	Not critical	5 µg/g creatinine	ACGIH BEI
	7789-23-3	Fluoride (Fluorine)	Urine	Prior to shift (16 hours after exposure ceases)	2 mg/l	ACGIH BEI
		Fluoride (Fluorine)	Urine	End of shift (As soon as possible after exposure ceases)	3 mg/l	ACGIH BEI
	12125-01-8	Fluoride (Fluorine)	Urine	Prior to shift (16 hours after exposure ceases)	2 mg/l	ACGIH BEI
		Fluoride (Fluorine)	Urine	End of shift (As soon as possible after exposure ceases)	3 mg/l	ACGIH BEI

Personal protective equipment

Respiratory protection : In the case of vapor formation use a respirator with an approved filter.

Hand protection
Material : Protective gloves

Remarks : The choice of an appropriate glove does not only depend on its material but also on other quality features and is different from one producer to the other. Take note of the information

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	given by the producer concerning permeability and break through times, and of special workplace conditions (mechanical strain, duration of contact).
Eye protection	: Tightly fitting safety goggles Wear face-shield and protective suit for abnormal processing problems. Do not wear contact lenses. Ensure that eyewash stations and safety showers are close to the workstation location.
Skin and body protection	: Choose body protection according to the amount and concentration of the dangerous substance at the workplace. Acid-resistant protective clothing Footwear protecting against chemicals Workers should wear antistatic footwear.
Hygiene measures	: Keep away from food and drink. Wash hands before breaks and at the end of workday. Ensure adequate ventilation, especially in confined areas. Keep working clothes separately. Avoid contact with the skin and the eyes. When using do not eat, drink or smoke.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	: liquid
Color	: No data available
Odor	: No data available
Odor Threshold	: No data available
pH	: No data available
Melting point/range	: No data available
Boiling point/boiling range	: No data available
Flash point	: No data available
Evaporation rate	: No data available
Burning rate	: No data available
Upper explosion limit	: No data available
Lower explosion limit	: No data available
Vapor pressure	: No data available
Relative vapor density	: No data available
Relative density	: No data available

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Density	: No data available
Solubility(ies)	
Water solubility	: No data available
Solubility in other solvents	: No data available
Partition coefficient: n-octanol/water	: No data available
Autoignition temperature	: No data available
Decomposition temperature	: No data available
Viscosity	
Viscosity, dynamic	: No data available
Viscosity, kinematic	: No data available
Explosive properties	: No data available
Oxidizing properties	: No data available

SECTION 10. STABILITY AND REACTIVITY

Reactivity	: No decomposition if stored and applied as directed.
Chemical stability	: No decomposition if stored and applied as directed.
Possibility of hazardous reactions	: Stable under recommended storage conditions. Hazardous decomposition products formed under fire conditions. Vapors may form explosive mixture with air. Keep away from oxidizing agents, and acidic or alkaline products.
Conditions to avoid	: Heat, flames and sparks.
Incompatible materials	: No data available
Hazardous decomposition products	: No decomposition if stored and applied as directed.

SECTION 11. TOXICOLOGICAL INFORMATION**Acute toxicity**

Harmful if swallowed or if inhaled.

Product:

Acute oral toxicity	: No data available
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Acute toxicity estimate: 662.07 mg/kg
Method: Calculation method

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Acute inhalation toxicity : No data available

Acute toxicity estimate: 10.12 mg/l
Exposure time: 4 h
Test atmosphere: vapor
Method: Calculation method

Acute dermal toxicity : No data available

Acute toxicity estimate: > 5,000 mg/kg
Method: Calculation method

Ingredients:**2-methylpentane-2,4-diol:**

Acute oral toxicity : LD50 Oral (Rat): 3,700 mg/kg

Acute dermal toxicity : LD50 Dermal (Rabbit): 7,892 mg/kg

ethanol:

Acute oral toxicity : LD50 Oral (Rat): 10,470 mg/kg

Acute inhalation toxicity : LC50 (Rat): 20000 ppm
Exposure time: 10 h

PEG:

Acute inhalation toxicity : No data available

Acute dermal toxicity : No data available

Zinc sulfate, heptahydrate (1:1:7):

Acute oral toxicity : LD50 Oral (Rat): 2,150 mg/kg

Magnesium nitrate, hexahydrate:

Acute oral toxicity : LD50 Oral (Rat): 5,440 mg/kg

nickel chloride:

Acute oral toxicity : LD50 Oral (Rat): 105 mg/kg

Magnesium chloride, hexahydrate:

Acute oral toxicity : LD50 Oral (Rat): 8,100 mg/kg

glycerol:

Acute oral toxicity : LD50 Oral (Rat): 12,000 mg/kg

Acute dermal toxicity : LD50 Dermal (Rabbit): 10,000 mg/kg

cadmium chloride:

Acute oral toxicity : LD50 Oral (Rat): 88 mg/kg

calcium acetate hydrate:

Acute oral toxicity : LD50 Oral (Rat): 4,280 mg/kg

caesium chloride:

Acute oral toxicity : LD50 Oral (Rat): 2,600 mg/kg

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potassium iodide:

Acute oral toxicity : LD50 Oral (Mouse): 1,000 mg/kg

Acute inhalation toxicity : No data available

Acute dermal toxicity : No data available

sodium iodide:

Acute oral toxicity : LD50 Oral (Rat): 4,340 mg/kg

lithium sulfate, monohydrate:

Acute oral toxicity : LD50 Oral (Rat): 613 mg/kg

potassium bromide:

Acute oral toxicity : LD50 Oral (Rat): 3,070 mg/kg

2-methylpropan-2-ol:

Acute oral toxicity : LD50 Oral (Rat): 2,743 mg/kg

Acute dermal toxicity : LD50 Dermal (Rabbit): > 2,000 mg/kg

potassium nitrate:

Acute oral toxicity : LD50 Oral (Rat): 3,750 mg/kg

potassium thiocyanate:

Acute oral toxicity : LD50 Oral (Rat): 854 mg/kg

citric acid:

Acute oral toxicity : LD50 Oral (Rat): 5,400 mg/kg

Acute dermal toxicity : LD50 Dermal (Rat): > 2,000 mg/kg

sodium nitrate:

Acute oral toxicity : LD50 Oral (Rat): 1,267 mg/kg

LD50 Oral (Rabbit): 2,680 mg/kg

sodium thiocyanate:

Acute oral toxicity : LD50 Oral (Rat): 764 mg/kg

Acute inhalation toxicity : Acute toxicity estimate: 1.6 mg/l
Test atmosphere: dust/mist**ammonium nitrate:**

Acute oral toxicity : LD50 Oral (Rat): 2,217 mg/kg

ammonium formate:

Acute oral toxicity : LD50 Oral (Mouse): 2,250 mg/kg

potassium fluoride:

Acute oral toxicity : LD50 Oral (Rat): 148 - 225 mg/kg

ammonium chloride:

Acute oral toxicity : LD50 Oral (Rat): 1,650 mg/kg

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Skin corrosion/irritation

Causes skin irritation.

Product:

Remarks:

May cause skin irritation and/or dermatitis.

Ingredients:**Magnesium nitrate, hexahydrate:**

Species: Rabbit

Exposure time: 24 h

Result: Mild skin irritation

glycerol:

Species: Rabbit

Exposure time: 24 h

Result: Mild skin irritation

sodium thiocyanate:

Species: Rabbit

Result: No skin irritation

Serious eye damage/eye irritation

Causes serious eye damage.

Product:

Remarks:

May cause irreversible eye damage.

Ingredients:**ethanol:**

Result: Eye irritation

Magnesium nitrate, hexahydrate:

Species: Rabbit

Result: Mild eye irritation

Exposure time: 24 h

glycerol:

Species: Rabbit

Result: Mild eye irritation

Exposure time: 24 h

sodium thiocyanate:

Species: Rabbit

Result: No eye irritation

Respiratory or skin sensitization

Skin sensitization: May cause an allergic skin reaction.

Respiratory sensitization: May cause allergy or asthma symptoms or breathing difficulties if inhaled.

Product:

Remarks:

Causes sensitization. May cause sensitization by inhalation and skin contact.

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Ingredients:**sodium thiocyanate:**

Species: Humans

Result: positive

Species: Guinea pig

Result: positive

Germ cell mutagenicity

May cause genetic defects.

Carcinogenicity

May cause cancer.

IARC

Group 2A: Probably carcinogenic to humans

Magnesium nitrate, hexahydrate 13446-18-9

Potassium nitrate 7757-79-1

Sodium nitrate 7631-99-4

Ammonium nitrate 6484-52-2

Lithium nitrate 7790-69-4

Group 1: Carcinogenic to humans

nickel chloride 7791-20-0

cadmium chloride 10108-64-2

OSHA

OSHA specifically regulated carcinogen

cadmium chloride 10108-64-2

NTP

Known to be human carcinogen

Nickel chloride 7791-20-0

Cadmium chloride 10108-64-2

Reproductive toxicity

May damage fertility or the unborn child.

STOT-single exposure

May cause respiratory irritation.

STOT-repeated exposure

Causes damage to organs through prolonged or repeated exposure.

Aspiration toxicity

Not classified based on available information.

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Further information**Product:**

Remarks:

Solvents may degrease the skin.

SECTION 12. ECOLOGICAL INFORMATION**Ecotoxicity****Product:**

Toxicity to fish : No data available

Toxicity to algae : No data available

Toxicity to bacteria : No data available

Ingredients:**2-methylpentane-2,4-diol:**Toxicity to fish : LC50 (Pimephales promelas (fathead minnow)): 10,700 mg/l
Exposure time: 96 hToxicity to daphnia and other : EC50 (Daphnia magna (Water flea)): 3,200 mg/l
aquatic invertebrates Exposure time: 48 h**PEG:**Toxicity to fish : (Leuciscus idus (Golden orfe)): > 500 mg/l
Exposure time: 96 h
Test Type: static test**Zinc sulfate, heptahydrate (1:1:7):**Toxicity to fish : LC50 (Fish): 1 mg/l
Exposure time: 96 h**nickel chloride:**Toxicity to daphnia and other : EC50 (Daphnia magna (Water flea)): 0.51 mg/l
aquatic invertebrates Exposure time: 48 h**glycerol:**Toxicity to fish : LC0 (Leuciscus idus (Golden orfe)): > 250 mg/l
Exposure time: 48 h**cadmium chloride:**Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 0.003 mg/l
Exposure time: 96 hToxicity to daphnia and other : EC50 (Daphnia magna (Water flea)): 0.016 mg/l
aquatic invertebrates Exposure time: 48 h
Test Type: Immobilization**caesium chloride:**Toxicity to daphnia and other : EC50 (Daphnia): 7.4 mg/l
aquatic invertebrates Exposure time: 48 h**potassium iodide:**

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Toxicity to fish	: LC50 (Oncorhynchus mykiss (rainbow trout)): 2,190 mg/l Exposure time: 96 h
sodium iodide:	
Toxicity to fish	: LC50 (Oncorhynchus mykiss (rainbow trout)): 860 mg/l Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates	: EC50 (Daphnia magna (Water flea)): 0.17 mg/l Exposure time: 48 h
potassium bromide:	
Toxicity to fish	: LC50 (Pimephales promelas (fathead minnow)): > 30 mg/l Exposure time: 96 h
2-methylpropan-2-ol:	
Toxicity to fish	: LC50 (Pimephales promelas (fathead minnow)): 6,140 mg/l Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates	: EC50 (Daphnia magna (Water flea)): 933 mg/l Exposure time: 48 h
potassium nitrate:	
Toxicity to fish	: LC50 (Oncorhynchus mykiss (rainbow trout)): > 98.9 mg/l Exposure time: 96 h
potassium thiocyanate:	
Toxicity to fish	: LC50 (Oncorhynchus mykiss (rainbow trout)): > 100 mg/l Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates	: EC50 (Daphnia magna (Water flea)): 11 mg/l Exposure time: 48 h
citric acid:	
Toxicity to fish	: LC50 (Leuciscus idus (Golden orfe)): 440 mg/l Exposure time: 48 h
Toxicity to daphnia and other aquatic invertebrates	: (Daphnia magna (Water flea)): 1,535 mg/l Exposure time: 24 h Test Type: static test
sodium nitrate:	
Toxicity to fish	: LC50 (Gambusia affinis (Mosquito fish)): 6,650 mg/l Exposure time: 96 h Test Type: static test
sodium thiocyanate:	
Toxicity to fish	: LC50 (Oncorhynchus mykiss (rainbow trout)): 233 mg/l Exposure time: 96 h LC50 (Pimephales promelas (fathead minnow)): > 100 mg/l Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates	: EC50 (Daphnia magna (Water flea)): 11 mg/l Exposure time: 48 h
Toxicity to algae	: (Pseudokirchneriella subcapitata (green algae)): > 100 mg/l

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Toxicity to bacteria : EC10 (Bacteria): 8,000 mg/l
Method: OECD Test Guideline 209

ammonium chloride:

Toxicity to fish : LC50 (Cyprinus carpio (Carp)): 209 mg/l
Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 161 mg/l
Exposure time: 48 h

Persistence and degradability

No data available

Bioaccumulative potential**Product:**

Bioaccumulation : No data available

Ingredients:**sodium thiocyanate:**

Partition coefficient: n-octanol/water : Remarks: Not applicable

Mobility in soil

No data available

Other adverse effects**Product:**

Ozone-Depletion Potential : Regulation: 40 CFR Protection of Environment; Part 82
Protection of Stratospheric Ozone - CAA Section 602 Class I Substances
Remarks: This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

Additional ecological information : An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life with long lasting effects.

SECTION 13. DISPOSAL CONSIDERATIONS**Disposal methods**

Waste from residues : The product should not be allowed to enter drains, water courses or the soil.
Send to a licensed waste management company.
Dispose of as hazardous waste in compliance with local and national regulations.

Contaminated packaging : Dispose of as unused product.

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Do not re-use empty containers.

SECTION 14. TRANSPORT INFORMATION**IATA-DGR**

UN/ID No. : UN 1993
Proper shipping name : Flammable liquid, n.o.s.
(ethanol,)
Class : 3
Packing group : II
Labels : Flammable Liquids

IMDG-Code

UN number : UN 1993
Proper shipping name : FLAMMABLE LIQUID, N.O.S.
(ethanol,)
Class : 3
Packing group : II
Labels : 3
EmS Code : F-E, S-E
Marine pollutant : yes

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

Domestic regulation**49 CFR**

UN/ID/NA number : UN 1993
Proper shipping name : FLAMMABLE LIQUIDS, N.O.S.
(ethanol,)
Class : 3
Packing group : II
Labels : Class 3 - Flammable Liquid
ERG Code : 128
Marine pollutant : yes(ZINC SULFATE HEPTAHYDRATE, NICKEL(II)
CHLORIDE)

SECTION 15. REGULATORY INFORMATION**EPCRA - Emergency Planning and Community Right-to-Know****SARA 304 Extremely Hazardous Substances Reportable Quantity**

This material does not contain any components with a section 304 EHS RQ.

SARA 311/312 Hazards : Fire Hazard
Acute Health Hazard
Chronic Health Hazard

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SARA 302 : No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 : The following components are subject to reporting levels established by SARA Title III, Section 313:

Zinc sulfate, heptahydrate (1:1:7)	7446-20-0
Magnesium nitrate, hexahydrate	13446-18-9
potassium nitrate	7757-79-1
sodium nitrate	7631-99-4
ammonium nitrate	6484-52-2
lithium nitrate	7790-69-4
nickel chloride	7791-20-0
cadmium chloride	10108-64-2
2-methylpropan-2-ol	75-65-0

US State Regulations

California Prop. 65 WARNING! This product contains a chemical known in the State of California to cause cancer.

ethanol	64-17-5
nickel chloride	7791-20-0
cadmium chloride	10108-64-2

WARNING: This product contains a chemical known in the State of California to cause birth defects or other reproductive harm.

ethanol	64-17-5
Lithium citrate tribasic tetrahydrate	6080-58-6

TSCA list

No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

SECTION 16. OTHER INFORMATION**Full text of other abbreviations**

(Q)SAR - (Quantitative) Structure Activity Relationship; ASTM - American Society for the Testing of Materials; bw - Body weight; DIN - Standard of the German Institute for Standardisation; ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory

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concentration; ICAO - International Civil Aviation Organization; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISO - International Organisation for Standardization; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; UN - United Nations; vPvB - Very Persistent and Very Bioaccumulative; DSL - Domestic Substances List (Canada); KECI - Korea Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); AICS - Australian Inventory of Chemical Substances; IECSC - Inventory of Existing Chemical Substances in China; ENCS - Existing and New Chemical Substances (Japan); ISHL - Industrial Safety and Health Law (Japan); PICCS - Philippines Inventory of Chemicals and Chemical Substances; NZIoC - New Zealand Inventory of Chemicals; TCSI - Taiwan Chemical Substance Inventory; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; DOT - Department of Transportation; EHS - Extremely Hazardous Substance; HMIS - Hazardous Materials Identification System; MSHA - Mine Safety and Health Administration; NFPA - National Fire Protection Association; RCRA - Resource Conservation and Recovery Act; RQ - Reportable Quantity; SARA - Superfund Amendments and Reauthorization Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; GLP - Good Laboratory Practice; ERG - Emergency Response Guide; NTP - National Toxicology Program; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods

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The information provided in this Material Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.