



TULSI ENTERPRISES LTD.

Safety Data Sheet Rev

SECTION 1: Identification

1.1 Product identifier

Product name	Rev
Brand	Optic Foliar

1.3 Recommended use of the chemical and restrictions on use

Plant Foliar Spray

1.4 Supplier's details

Name	Tulsi Enterprises Ltd.
Address	PO BOX 31016, Sunshine Village, Delta BC V4E 3M9

Telephone	(604) 218-8567
-----------	----------------

1.5 Emergency phone number(s)

(604) 218-8567

SECTION 2: Hazard identification

2.1 Classification of the substance or mixture

GHS classification in accordance with: (US) OSHA (29 CFR 1910.1200)

Not a hazardous substance or mixture.

2.2 GHS label elements, including precautionary statements

Not a hazardous substance or mixture.

2.3 Other hazards which do not result in classification

Not a hazardous substance or mixture.

SECTION 3: Composition/information on ingredients

Safety Data Sheet

Rev

3.2 Mixtures

Components

1. Potassium sulfate

Concentration 2 - 5 %
EC no. 231-915-5
CAS no. 7778-80-5

2. Potassium phosphate Monobasic

Concentration 2 - 5 %
CAS no. 7778-77-0

3. Ammonium Nitrate

Concentration 2 - 5 %
EC no. 229-347-8
CAS no. 6484-52-2

- Oxidizing solids, Cat. 3
- Serious eye damage/eye irritation, Cat. 2

H272 May intensify fire; oxidizer
H319 Causes serious eye irritation

4. Zincate(2-), [[N,N'-1,2-ethanediylbis[N-[(carboxy-kappaO)methyl]glycinato-kappaN,kappaO]](4-)]-, sodium (1:2), (OC-6-21)-

Concentration 0.001 - 0.002 %
EC no. 237-865-0
CAS no. 14025-21-9

5. Water

Concentration 85 - 90 %
EC no. 231-791-2
CAS no. 7732-18-5

SECTION 4: First-aid measures

4.1 Description of necessary first-aid measures

If inhaled Remove to fresh air and promote deep breathing. Get medical attention if effects persist.

In case of skin contact Wash with plenty of water for at least 15 minutes. Call a poison center or doctor if irritation develops or persists. Take off contaminated clothing and wash it before reuse.

Acute and delayed symptoms and effects: Causes skin irritation.
Signs/symptoms may include localized redness, swelling, and itching.

Safety Data Sheet

Rev

In case of eye contact	Rinse cautiously with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical attention/advice. Acute and delayed symptoms and effects: Causes serious eye irritation. Signs/symptoms may include redness, swelling, pain, tearing, and blurred or hazy vision.
If swallowed	Do not induce vomiting. Never give anything by mouth to an unconscious person. Give water to drink if conscious. Get medical attention if effects persist. Acute and delayed symptoms and effects: May cause gastrointestinal irritation. Signs/symptoms may include abdominal pain, stomach upset, nausea, vomiting and diarrhea.

4.2 Most important symptoms/effects, acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2) and/or in section 11

4.3 Indication of immediate medical attention and special treatment needed, if necessary

Treat symptomatically and supportively.

SECTION 5: Fire-fighting measures

5.1 Suitable extinguishing media

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Specific hazards arising from the chemical

None known

5.3 Special protective actions for fire-fighters

Wear self-contained breathing apparatus for firefighting if necessary.

Further information

Use water spray to cool unopened containers.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Wear personal protection recommended in Section 8. Isolate the hazard area and deny entry to unnecessary and unprotected personnel.

6.2 Environmental precautions

Do not discharge product into natural waters without pre-treatment or adequate dilution.

6.3 Methods and materials for containment and cleaning up

Soak up with inert absorbent material and dispose of in accordance with applicable local or national requirements. Keep in suitable, closed containers for disposal.

Reference to other sections

For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Safety Data Sheet

Rev

Avoid contact with skin and eyes. Do not eat, drink or smoke while handling. Wash hands with soap and water after handling. Keep out of the reach of children. For precautions see section 2.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

Specific end use(s)

Apart from the uses mentioned in section 1 no other specific uses are stipulated.

SECTION 8: Exposure controls/personal protection

8.2 Appropriate engineering controls

Under manufacturers recommended use, no particular controls necessary.

8.3 Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection

Chemical goggles or safety glasses.

Skin protection

Wear suitable protective clothing.

Body protection

Manufacturing Sites:

Wear suitable protective clothing.

Distribution, Workplace and Household Settings:

No special protective equipment required

Respiratory protection

Distribution, Workplace and Household Settings: No special protective equipment required. Product Manufacturing Plant (needed at Product-Producing Plant ONLY): In case of insufficient ventilation wear suitable respiratory equipment

Thermal hazards

No data available.

Environmental exposure controls

No data available.

SECTION 9: Physical and chemical properties

Information on basic physical and chemical properties

Appearance/form (physical state, color, etc.)	Semi Clear liquid
Odor	Mild Smell
Odor threshold	No data available.
pH	5.5
Melting point/freezing point	No data available.
Initial boiling point and boiling range	No data available.
Flash point	No data available.
Evaporation rate	No data available.
Flammability (solid, gas)	No data available.

Safety Data Sheet

Rev

Upper/lower flammability limits	No data available.
Upper/lower explosive limits	No data available.
Vapor pressure	No data available.
Vapor density	No data available.
Relative density	No data available.
Solubility(ies)	No data available.
Partition coefficient: n-octanol/water	No data available.
Auto-ignition temperature	No data available.
Decomposition temperature	No data available.
Viscosity	No data available.
Explosive properties	No data available.
Oxidizing properties	No data available.

Other safety information

No data available.

SECTION 10: Stability and reactivity

10.1 Reactivity

Contact with incompatible materials. Sources of ignition. Exposure to heat.

10.2 Chemical stability

Stable under normal storage conditions.

10.3 Possibility of hazardous reactions

No data available.

10.4 Conditions to avoid

Heat, flames and sparks. Incompatible products. Keep away from open flames, hot surfaces and sources of ignition.

10.5 Incompatible materials

Avoid contact with strong oxidizers, strong mineral acids such as sulphuric acid, nitrating agents, halogenating agents, alkali metals or aluminum.

10.6 Hazardous decomposition products

Nitrogen oxides, ammonia, hydrogen cyanide, nitriles, isocyanates, nitrosamines, formaldehyde, carbon monoxide, carbon dioxide and other unidentified hydrocarbons in smoke may occur.

Water: In the event of fire: see section 5

SECTION 11: Toxicological information

Information on toxicological effects

Acute toxicity

As Mixture: No Data Available.

Potassium sulfate: With potassium sulphate a reliable acute dermal toxicity study in rats (according to OECD 402) has been performed showing an LD50 > 2000 mg/kgbw. A reliable acute oral toxicity study with rats according to OECD 425 with potassium magnesium sulphate has been performed, showing LD50>2000 mg/kg bw. An inhalation study with ammonium sulphate investigating mucociliary clearance did not show effects in rats at 3.6 mg/m3.

Safety Data Sheet

Rev

Based on reliable studies on potassium magnesium sulphate and ammonium sulphate for acute oral route, the LD50 for the sulphate category is >2000 mg/kg. Based on a reliable acute inhalation study on ammonium sulphate, the LC50 for the sulphate category is >1200 mg/m³.

Potassium phosphate Monobasic: Acute Oral Toxicity: LD50>2000 mg/kg bw.
Acute Dermal Toxicity: LD50 >2000 mg/kg bw.
Acute Inhalation Toxicity: LC50>0.83 mg/L (maximum attainable concentration)

Ammonium Nitrate: Acute Oral Toxicity: LD50>2000 mg/kg bw
Acute Dermal Toxicity: LD50>5000 mg/kg bw

Zincate(2-), [[N,N'-1,2-ethanediy]bis[N-[(carboxy-kappaO)methyl]glycinato-kappaN,kappaO]](4-)-, sodium (1:2), (OC-6-21)-: Acute Oral Toxicity: LD50>2000 mg/kg bw.
Acute Dermal Toxicity: LD50>2000 mg/kg bw.
Acute Inhalation Toxicity: LC50>5 mg/L.

Skin corrosion/irritation

As Mixture: No Data Available.

Potassium sulfate: An in vitro human skin irritation study according to the EU guideline, performed with Potassium sulfate (containing 15% KHSO₄) does not show irritation.

Potassium phosphate Monobasic: Not irritant

Ammonium Nitrate: Not Skin irritant.

Serious eye damage/irritation

As Mixture: No Data Available.

Potassium sulfate: An in vivo eye irritation study according to OECD guideline 405 with potassium sulphate 99% pure is not irritating in rabbits. Additionally an in vitro eye irritation study according to OECD guideline 437 with potassium sulphate containing 15% KHSO₄, is severely irritating in bovine cornea.

Potassium phosphate Monobasic: Not irritant

Ammonium Nitrate: Causes serious eye irritation.

Zincate(2-), [[N,N'-1,2-ethanediy]bis[N-[(carboxy-kappaO)methyl]glycinato-kappaN,kappaO]](4-)-, sodium (1:2), (OC-6-21)-: Not Eye Irritant.

Respiratory or skin sensitization

As Mixture: No Data Available.

Potassium sulfate: According to Directive 67/548/EC and the CLP Directive no classification of potassium sulphate for sensitisation is required based on the data present.

Potassium phosphate Monobasic: Not irritant

Safety Data Sheet

Rev

Ammonium Nitrate: Not Sensitiser.

Germ cell mutagenicity

As Mixture: No Data Available.

Potassium sulfate: The available data indicate that no classification is required with regard to mutagenicity for potassium sulphate according to Directive 67/548/EC and the CLP directive.

Potassium phosphate Monobasic: Not Mutagenic

Ammonium Nitrate: Based on the available data, ammonium nitrate does not have to be classified for genotoxicity according to Regulation (EC) No 1272/2008.

Zincate(2-), [[N,N'-1,2-ethanediy]bis[N-[(carboxy-kappaO)methyl]glycinato-kappaN,kappaO]](4-)]-, sodium (1:2), (OC-6-21)-: No genotoxicity studies have been carried out with EDTA-ZnNa₂, several genotoxicity studies are available for other EDTA-compounds such as EDTA-Na₂H₂, EDTA-Na₃H and several metal-chelates. None of these showed genotoxic activity.

Carcinogenicity

As Mixture: No Data Available.

Potassium sulfate: Although no carcinogenicity study seems to be required for potassium sulphate as the substance is not genotoxic, a reliable chronic/carcinogenicity study is available for ammonium sulphate. No evidence of a carcinogenic potential was observed in this study with rats following closely the requirements of OECD testguideline 453.

Potassium phosphate Monobasic: A number of recent publications have hypothesised a link between very high or very low dietary phosphate levels and tumourigenesis (typically using potassium or sodium orthophosphates as the test substance). The most recent publications have been included as a representation of the typical investigations performed in this area. These data are not sufficient to fulfil the guideline requirement for carcinogenicity and are not considered to be adequate or reliable for use in risk assessment and/or classification and labelling. As such these studies are provided for completeness of the data set only.

Ammonium Nitrate: No Data Availale.

Zincate(2-), [[N,N'-1,2-ethanediy]bis[N-[(carboxy-kappaO)methyl]glycinato-kappaN,kappaO]](4-)]-, sodium (1:2), (OC-6-21)-: Not Carcinogenic.

Reproductive toxicity

As Mixture: No Data Available.

Potassium sulfate: A reliable subacute oral toxicity study available on potassium sulphate shows a NOAEL of 1500 mg/kg bw/day, the highest dose tested. The study was performed according to OECD 422. In addition, repeated dose toxicity data on ammonium sulphate are considered. The 90-day oral study in rats showing a NOAEL of 886 mg/kg bw/day (LOAEL 1792 mg/kg bw/day) and the chronic oral toxicity study in rats showing a NOAEL of 256 mg/kg bw/day (LOAEL 1527 mg/kg bw/day). Based on these reliable studies with potassium sulphate and ammonium sulphate for oral repeated dose toxicity, the rat oral NOAEL for the sulphate category is 1500 mg/kg bw/day for subacute toxicity. For chronic toxicity the NOAEL for the sulphate category is 256 mg/kg bw/day.

Safety Data Sheet

Rev

Potassium phosphate Monobasic: One key study is available for the endpoint '8.7.2. Developmental toxicity study'. This study assesses the teratogenic potential of potassium dihydrogenorthophosphate (Bailey, 1975) in rats and mice. This study is considered to be adequate to fulfil this endpoint. In addition, supporting data on an additional analogous substance; sodium dihydrogenorthophosphate is also provided to support the lack of developmental toxicity potential of sodium and potassium orthophosphates as a group of chemicals.

Ammonium Nitrate: No reliable study with ammonium nitrate is present. In a reliable OECD 422 screening study in rats with potassium nitrate no effects were found up to the highest dose tested (1500 mg/kg bw/d). In addition, in repeated dose studies with potassium nitrate and ammonium sulfate no effects on reproduction organs were found. Ammonium nitrate dissociates into NH₄⁺ and nitrate ions. Nitrates are regulated within the body. The ammonium cation is not an essential ion, but a waste product from animal metabolism that is re-used in protein synthesis via glutamate. Depending on the species, ammonium will be directly excreted to the environment or converted to urea, which is less toxic. Together with the available data showing no effects, an additional study is therefore not considered necessary. The overall conclusion for ammonium nitrate is that the substance may not present a risk for reproductive toxicity.

Zincate(2-), [[N,N'-1,2-ethanediy]bis[N-[(carboxy-kappaO)methyl]glycinato-kappaN,kappaO]](4-)-, sodium (1:2), (OC-6-21)-: Effects on reproduction and effects on fetal development have only been observed at high levels of the (metal) chelates, i.e. at levels of approximately 1000 mg/kg bw and above, and are considered to be due to zinc deficiency. No such effects were seen in the case of sufficient zinc and a subcutaneous injection study with DTPA-ZnNa₃ did not show developmental effects even at a very high level. Therefore, based on the results obtained in all these studies and taking into account the provisions laid down in Council Directive 67/548/EEC and CLP, classification with regard to toxicity to reproduction is not required for EDTA-ZnNa₂.

Summary of evaluation of the CMR properties

As Mixture: No Data Available.

Potassium sulfate: No CMR classification.

Ammonium Nitrate: No CMR Classification.

STOT-single exposure

As Mixture: No Data Available.

Potassium sulfate: No STOT SE classification

Potassium phosphate Monobasic: No STOT SE Toxicity

Ammonium Nitrate: No STOT SE Toxicity.

STOT-repeated exposure

As Mixture: No Data Available.

Potassium sulfate: No STOT RE classification

Potassium phosphate Monobasic: No STOT RE toxicity

Safety Data Sheet

Rev

Ammonium Nitrate: No STOT RE Toxicity.

Aspiration hazard

As Mixture: No Data Available.

Potassium sulfate: Not Applicable

Potassium phosphate Monobasic: Not applicable

Zincate(2-), [[N,N'-1,2-ethanediylbis[N-[(carboxy-kappaO)methyl]glycinato-kappaN,kappaO]](4-)]-, sodium (1:2), (OC-6-21)-: Not Applicable.

Additional information

No Data Available.

SECTION 12: Ecological information

Toxicity

As Mixture: No Data Available.

Potassium sulfate: Fish (Fathead minnow) showed a 96hr LC50 of 680 mg/L.
Daphnia magna showed a 48 hr EC50 of 720 mg/L.

Ammonium Nitrate: Fish LC50>100 mg/L, NOEC 58 mg/L
Daphnia Magna EC50>100 mg/L
Algae EC50>100 mg/L, NOEC 100 mg/L

Zincate(2-), [[N,N'-1,2-ethanediylbis[N-[(carboxy-kappaO)methyl]glycinato-kappaN,kappaO]](4-)]-, sodium (1:2), (OC-6-21)-: No Data Available.

Persistence and degradability

As Mixture: No Data Available.

Potassium sulfate: Due to the inorganic nature of the substance standard testing systems are not applicable.

Sulfates can be retained in soil, both by incorporation into inorganic matter (e.g. as sulfate esters of humic acids) and adsorbed to soil particles such as hydrous iron and aluminum sesquioxides.

Potassium phosphate Monobasic: Potassium dihydrogenorthophosphate is an inorganic substance, biodegradation studies are not applicable. No further testing is deemed to be necessary.

Ammonium Nitrate: Ready biodegradation studies do not need to be conducted since the substance is inorganic (Annex VII REACH). In addition, in the anaerobic transformation of ammonium, one group of bacteria oxidizes ammonium to nitrite while another group oxidizes nitrite into nitrate. The average biodegradation rate in wastewater plant at 20 degrees Celsius is 52 g N/kg dissolved solid/day. Nitrate degradation is fastest in anaerobic conditions. In the anaerobic transformation of nitrate into N₂, N₂O and NH₃, the biodegradation rate in wastewater plant at 20 degrees Celsius is 70 g N/kg dissolved solid/day.

Safety Data Sheet

Rev

Zincate(2-), [[N,N'-1,2-ethanediylbis[N-[(carboxy-kappaO)methyl]glycinato-kappaN,kappaO]](4-)]-, sodium (1:2), (OC-6-21)-: EDTA is not found to be readily biodegradable according to OECD criteria. In standard OECD 301D ready biodegradability tests with natural river water as inoculum it was shown that EDTA complexes with a stability constant lower than $10E14$ like EDTA-Na₄, EDTA-CaNa₂, EDTA-MgNa₂ etc. less than 60% biodegradation was observed after 28 days indicating that these substances should indeed not be classified as readily biodegradable. In the same tests however > 60% biodegradation was observed when these tests are prolonged to day 60 (Ginkel, 2018) indicating that these complexes, having stability constants < $10E14$, are ultimately biodegradable and should be classified as "not persistent".

Complexes with a stability constant $\geq 10E14$ like EDTA-ZnX complexes (where X stands for K₂, Na₂ or (NH₄)₂) should be considered "Completely and inherently biodegradable". The dissociation rates are however considered too low to allow classification as not persistent.

Bioaccumulative potential

As Mixture: No Data Available.

Potassium sulfate: Simple inorganic salts with high aqueous solubility will exist in a dissociated form in an aqueous solution. Such a substance has a low potential for bioaccumulation.

Potassium phosphate Monobasic: No experimental data on bioaccumulation exist. However due to the hydrophilic nature of the substance, bioaccumulation is not expected as accumulation in fats is not possible. The substance when dissolved in water (and so animal tissues/fluids) will effectively separate into/become simply the two ions "phosphate" and "potassium" which are natural ionic components of blood, cell fluids, etc and therefore no further testing is considered to be necessary. In addition, no risk of secondary poisoning is anticipated for the same reasons. The potential for bioaccumulation is therefore considered to be minimal.

Zincate(2-), [[N,N'-1,2-ethanediylbis[N-[(carboxy-kappaO)methyl]glycinato-kappaN,kappaO]](4-)]-, sodium (1:2), (OC-6-21)-: Based on the estimated logKow (<3) and available BCF study in fish with radiolabelled EDTA (BCF range 1.1-1.8) it can be concluded there is low potential for bioaccumulation for EDTA-ZnNa₂

Mobility in soil

As Mixture: No Data Available.

Potassium sulfate: No data available.

Potassium phosphate Monobasic: No Data Found

Ammonium Nitrate: No Data Available.

Results of PBT and vPvB assessment

As Mixture: No Data Available.

Potassium sulfate: No data available.

Potassium phosphate Monobasic: No potential for bioaccumulation

Ammonium Nitrate: No Data Available.

Other adverse effects

As Mixture: No Data Available.

Safety Data Sheet

Rev

Potassium phosphate Monobasic: Potassium dihydrogenorthophosphate is not considered to pose a risk to the environment and as such is neither classified as harmful nor dangerous to the environment, in accordance with Regulation (EC) No. 1272/2008 (EU CLP).

SECTION 13: Disposal considerations

Disposal of the product

Disposal should be in accordance with applicable Federal, State and local laws and regulations. Local regulations may be more stringent than State or Federal requirements.

Disposal of contaminated packaging

Dispose of as unused product.

SECTION 14: Transport information

DOT (US)

Not dangerous goods

IMDG

Not dangerous goods

IATA

Not dangerous goods

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations specific for the product in question

Canadian Domestic Substances List (DSL)

Chemical name: Sulfuric acid dipotassium salt
CAS: 7778-80-5

Canadian Domestic Substances List (DSL)

Chemical name: Phosphoric acid, monopotassium salt
CAS: 7778-77-0

Canadian Domestic Substances List (DSL)

Chemical name: Phosphoric acid, potassium salt
CAS: 16068-46-5

New Jersey Right To Know Components

Common name: AMMONIUM NITRATE
CAS number: 6484-52-2

Pennsylvania Right To Know Components

Chemical name: Nitric acid, ammonium salt
CAS number: 6484-52-2

Canadian Domestic Substances List (DSL)

Chemical name: Nitric acid ammonium salt
CAS: 6484-52-2

Safety Data Sheet

Rev

Canadian Domestic Substances List (DSL)

Chemical name: Zincate(2-), [[N,N'-1,2-ethanediy]bis[N-(carboxymethyl)glycinato]](4-)-N,N',O,O',ON,ON']-, disodium, (OC-6-21)-
CAS: 14025-21-9

SARA 302 Components

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

SARA 313 Components

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards

No SARA Hazards

Massachusetts Right To Know Components

No components are subject to the Massachusetts Right to Know Act.

Pennsylvania Right To Know Components

Water

CAS-No. 7732-18-5

New Jersey Right To Know Components

Water

CAS-No. 7732-18-5

California Prop. 65 Components

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

Canadian Domestic Substances List (DSL)

Chemical name: Water

CAS: 7732-18-5

SECTION 16: Other information

DISCLAIMER: The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigation to determine the suitability of information for their particular purposes. In no event shall Tulsi Enterprises Ltd. be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, whatsoever arising, even if Tulsi Enterprises Ltd. has been advised of the possibility of such damages.