Last revised date : 2022-09-06

Safety Data Sheet(SDS)

1. Identification of the substance/mixture and of the company/undertaking

1) Product identifier : Esfenvalerate 3.5% CS
US-EPA registration no.: 71532-28

2) Relevant identified uses of the substance or mixture and uses advised against

○ Relevant identified uses

24. Plant protection products

○ Uses advised against

3) Supplier information

○ Company name [Manufacture/Supplier]

Company : LG Chem, Ltd.
Address : 19, Ijin-ro, Onsan-eup, Ulju-gun, Ulsan, Republic of Korea
Emergency number : 82-52-231-5208 (International), 1 201-816-2119 (North America)

○ Company name [Distributor]

Company : FarmHannong America, Inc
Address : 910 Sylvan Ave, STE 160, Englewood Cliffs, NJ 07632, USA
Emergency number : 82-52-231-5208 (International), 1 201-816-2119 (North America)

2. HAZARD IDENTIFICATION

1) Hazard classification

- Acute toxicity(Oral) Category 4
- Acute toxicity(Inhalation:Dust/mist) Category 3
- Skin corrosion/irritation Category 2
- Skin sensitization Category 1
- Carcinogenicity Category 2
- Germ cell mutagenicity Category 2
- Hazardous to the aquatic environment, short-term (acute) Acute 1
- Hazardous to the aquatic environment, long-term (chronic) Chronic 2

2) Allocation label elements

Hazard pictograms

- DANGER

Hazard statements

H302 Harmful if swallowed
H315 Causes skin irritation
H317 May cause an allergic skin reaction
H331 Toxic if inhaled
H341 Suspected of causing genetic defects
H351 Suspected of causing cancer
H400 Very toxic to aquatic life
H411 Toxic to aquatic life with long lasting effects

Precautionary statements

- Prevention

P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P261 Avoid breathing mist/vapours/spray.
P264 Wash mouse,skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P271 Use only outdoors or in a wellventilated area.
P272 Contaminated work clothing should not be allowed out of the workplace.
P280 Wear protective gloves/protective clothing/eye protection/face protection.

- Response

P301+P310 If you swallow: immediately receives medical institutions and doctors' consultation.
P302+P352 If you get on your skin: Wash with a large amount of water.
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P308+P313 If exposed or concerned: Get medical advice/attention.
P312 If you feel uncomfortable, receive medical institutions and doctors' consultation.
P320 Do first achievements to move to a fresh air in urgent.
P330 Rinse mouth.
P332+P313 If skin irritation occurs: Get medical advice/attention.
P333+P313 If skin irritation or a rash occurs: Get medical advice/attention.
P362+P364 Take off contaminated clothing and wash it before reuse.
P363 Wash contaminated clothing before reuse.

- Storage

P403+P233 Store in a wellventilated place. Keep container tightly closed.
P405 Store locked up.

- Disposal

P501 Dispose of contents and containers according to the legislation of the waste

3) Other hazards

○ Product NFPA Level

Health	Flamm abliity	Reactivity
3	1	0

(※ 0 = Insufficient , 1 = Slightly , 2 = ordinary , 3 = Highness , 4 = Very high)

3. Composition/Information on ingredients

Components	Common name	CAS No.	PCT(wt%)
Esfenvalerate	Esfenvalerate	66230-04-4	3.5
Glycerol	Glycerol	56-81-5	1.5
Water	Water	7732-18-5	69.961
Total amount of Trade secret substances 1~4			25.039

4. FIRST AID MEASURES

1) Following eye contact
   - In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
   - Seek immediate medial assistance.

2) Following skin contact
   - For hot product, immediately immerse in or flush the affected area with large amounts of cold water to dissipate heat.
   - For minor skin contact, avoid spreading material on unaffected skin.
   - In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
   - Remove and isolate contaminated clothing and shoes.
   - Seek immediate medial assistance.

3) Following inhalation
   - Administer oxygen if breathing is difficult.
   - Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.
   - Give artificial respiration if victim is not breathing.
   - If exposed to excessive levels of dusts or fumes, remove to fresh air and get medical attention if cough or other symptoms develop.
   - Keep victim warm and quiet.
   - Move to fresh air.

4) Following ingestion
   - Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.
   - Seek immediate medial assistance.

5) Advice to physician
   - Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
   - Exposures require specialized first aid with contact and medical follow-up .

5. FIRE FIGHTING MEASURES

1) Suitable (and unsuitable) extinguishing media

   ○ Suitable extinguishing media
   - CO_2.
   - Dry chemical.
   - Use alcohol foam, carbon dioxide, or water spray when fighting fires involving this material.
   - Use dry sand or earth to smother fire.
   - Water spray.

○ Unsuitable extinguishing media

- Direct water.

2) Special hazards arising from the substance or mixture

○ Pyrolytic product

- Can decompose at high temperatures forming toxic gases.
- During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.
- Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes.

○ Risk of fire and explosion

- Containers may explode when heated.
- Some may burn but none ignite readily.

○ Other

- No data available

3) Special protective equipment for firefighters

- Dike fire-control water for later disposal; do not scatter the material.
- Evacuate area and fight fire from a safe distance.
- Fire involving Tanks: ALWAYS stay away from tanks engulfed in fire.
- Fire involving Tanks: Cool containers with flooding quantities of water until well after fire is out.
- Fire involving Tanks: Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.
- Fire involving Tanks: For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.
- Fire involving Tanks: Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- Move containers from fire area if you can do it without risk.
- Rescuers should put on appropriate protective gear.
- Substance may be transported in a molten form.

6. ACCIDENTAL RELEASE MEASURES

1) Health considerations and protective equipment

- Clean up spills immediately, observing precautions in Protective Equipment section.
- Cover with plastic sheet to prevent spreading.
- Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
- ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area).
- Please note that materials and conditions to be avoided.
- Stop leak if you can do it without risk.

2) Environmental precautions

- Prevent entry into waterways, sewers, basements or confined areas.

3) For cleaning up

- Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers.
- Absorb spill with inert material (e.g., dry sand or earth), then place in a chemical waste container.
- Absorb the liquid and scrub the area with detergent and water.
- Reduce airborne dust and prevent scattering by moistening with water.

7. HANDLING AND STORAGE

1) Precautions for safe handling

- Avoid breathing vapors from heated material.
- Avoid prolonged or repeated contact with skin.
- Do not enter storage area unless adequately ventilated.
- Follow all MSDS/label precautions even after container is emptied because they may retain product residues.

- Handling refer to engineering control/personal protection section.
- Loosen closure cautiously before opening.
- Please note that materials and conditions to be avoided.
- Use care in handling/storage.
- Use only in a well-ventilated area.

2) Conditions for safe storage (including any incompatibilities)

- Empty drums should be completely drained, properly bunged, and promptly returned to a drum reconditioner, or properly disposed of.
- Keep away from food and drinking water.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

1) Chemical exposure limits, Biological exposure standard

Components	Occupational exposure limits	ACGIH	Biological standard
Esfenvalerate	TWA : Not applicable STEL : Not applicable	TWA : Not applicable STEL : Not applicable	Not applicable
Trade secret substances1	TWA : Not applicable STEL : Not applicable	TWA : Not applicable STEL : Not applicable	Not applicable
Trade secret substances2	TWA : Not applicable STEL : Not applicable	TWA : Not applicable STEL : Not applicable	Not applicable
Trade secret substances3	TWA : Not applicable STEL : Not applicable	TWA : Not applicable STEL : Not applicable	Not applicable
Glycerol	TWA : 5mg/m3 STEL : Not applicable	TWA : Not applicable STEL : Not applicable	Not applicable
Water	TWA : Not applicable STEL : Not applicable	TWA : Not applicable STEL : Not applicable	Not applicable
Trade secret substances4	TWA : Not applicable STEL : Not applicable	TWA : Not applicable STEL : Not applicable	Not applicable

2) Appropriate engineering controls

- Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.
- If user operations generate dust, fume, or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.
- Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.

3) Personal protection equipment

○ Respiratory protection

- If high frequency of use or exposure, wear air respirator.
- Wear breathing protection, which needs a confirmation from the Korea Occupational Safety and Health Agency.

○ Eye protection

- Wear suitable protective goggles and face shields.

○ Hand protection

- Wear suitable protective gloves.

○ Body protection

- Wear suitable protective clothing.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	No data available
Physical state	Liquid
Colour	No data available
Odour	No data available
Odour threshold	No data available
pH	6.5
Melting point/freezing point	No data available
Initial boiling point and boiling range	No data available
Flash point	102℃
Evaporation rate	No data available
Flammability(solid, gas)	No data available
Upper/lower flammability or explosive limits	No data available
Vapour pressure	No data available
Solubility(ies)	No data available
Vapour density	No data available
Relative density	No data available
n-octanol/water partition coefficient	No data available
Auto ignition temperature	No data available
Decomposition temperature	No data available
Viscosity	No data available
Molecular weight(mass)	No data available

10. STABILITY AND REACTIVITY

1) Stability and hazardous reactivity

- Can decompose at high temperatures forming toxic gases.
- Containers may explode when heated.
- Fire may produce irritating, corrosive and/or toxic gases.
- Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes.
- Some may burn but none ignite readily.

2) Conditions to avoid

- Ignition source(heat, spark, flame, etc.).

3) Incompatible materials

- Combustibles, reducing material.

4) Hazardous decomposition products

- Corrosive/toxic fume.
- During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

- Irritating, corrosive and/or toxic gas.

11. TOXICOLOGICAL INFORMATION

1) Exposure route information

○ Inhalation

- Toxic if inhaled

○ Skin Contact

- Causes skin irritation
- May cause an allergic skin reaction

○ Eye Contact

- Not applicable

○ Ingestion

- Harmful if swallowed

2) Health hazard information

○ Acute toxicity

● Acute toxicity(Oral) PRODUCT : Category 4(ATEmix = 625.533mg/kg)

- Esfenvalerate : LD50 88 ㎎ / ㎏ experimental species: Rat, Source: HSDB
- Trade secret substances1 : No data available
- Trade secret substances2 : LD50 25000 ㎎ / ㎏ (Mouse), Source: (TOMES;RTECS)
- Trade secret substances3 : LD50> 2000 ㎎ / ㎏ experimental species: Rat, Source: IUCLID
- Glycerol : LD50 27000 ㎎ / ㎏ experimental species: Rat, Source: ECHA
- Water : No data available
- Trade secret substances4 : LD50 180 ㎎ / ㎏ 180 ㎎ / ㎏ experimental species: Rat, Source: ChemIDplus

● Acute toxicity(Dermal) PRODUCT : Not classified

- Esfenvalerate : LD50> 2000 ㎎ / ㎏ experimental species: Rabbit, Source: HSDB, ChemIDplus
- Trade secret substances1 : No data available
- Trade secret substances2 : No data available
- Trade secret substances3 : LD50> 5000 ㎎ / ㎏ experimental species: Rat, Source: IUCLID
- Glycerol : LD50 45 ㎖ / ㎏ experimental species: Guinea pig, (female / male), Source: ECHA
- Water : No data available
- Trade secret substances4 : LD50 1,600 ㎎ / ㎏ experimental species: Rat,

● Acute toxicity(Inhalation:Gases) PRODUCT : Not classified

- Esfenvalerate : No data available
- Trade secret substances1 : No data available
- Trade secret substances2 : No data available
- Trade secret substances3 : No data available

- Glycerol : No data available

- Water : No data available

- Trade secret substances4 : No data available

● Acute toxicity(Inhalation:Vapours) PRODUCT : Not classified

- Esfenvalerate : No data available

- Trade secret substances1 : No data available

- Trade secret substances2 : No data available

- Trade secret substances3 : No data available

- Glycerol : LC50> 2.75 ㎎ / ℓ 4 hr experiment Species: Rat, Source: ECHA

- Water : No data available

- Trade secret substances4 : No data available

● Acute toxicity(Inhalation:Dust/mist) PRODUCT : Category 3(ATEmix = .576mg/L)

- Esfenvalerate : LC50 0.57 ㎎ / ℓ 4 hr experiment Species: Rat, Source: HSDB

- Trade secret substances1 : No data available

- Trade secret substances2 : No data available

- Trade secret substances3 : No data available

- Glycerol : No data available

- Water : No data available

- Trade secret substances4 : LC50 ≥0.588 ㎎ / ℓ 4 hr experiment Species: Rat, Source: ECHA

○ Skin corrosion/irritation PRODUCT : Category 2

- Esfenvalerate : For Causes irritation to human skin, and industrial products, skin irritation occurs, pure Espen balreo rate is non-irritating, Source: ICSC

- Trade secret substances1 : No data available

- Trade secret substances2 : No data available

- Trade secret substances3 : Rabbit / mild, Source: IUCLID

- Glycerol : Using the rabbit skin corrosion / irritation No eye irritation test results, Source: ECHA

- Water : No data available

- Trade secret substances4 : Skin corrosion / irritation test using rabbits (OECD TG404, GLP) is shown as the result of irritation (primary irritation index 6.2), Source: ECHA

○ Serious eye damage/eye irritation PRODUCT : Not classified

- Esfenvalerate : Material will cause a slight irritation of the eyes, the substance causes a slight irritation of the eyes, let a rabbit, so the band a little irritation, is classified in Category 2B (Similar material CAS No. 51630-58-1), Source: IPCS, ICSC, JMPR, NITE

- Trade secret substances1 : It causes eye irritation

- Trade secret substances2 : If irritation, Source: (TOMES;RTECS)

- Trade secret substances3 : No data available

- Glycerol : Not irritant, Rabbit, fully reversible, Source: ECHA

- Water : No data available

- Trade secret substances4 : bronopol 5% solution in the eye of the rabbit (solvent: polyethylene glycol 400) for knocking a result, a strong start polarity (appropriately discharge and conjunctival redness and swelling) after one hour off has been reported depression in all the test animals except for one to seven days the Japanese taken place. Judging from these results, bronopol is represented by a corrosive eye irritant, Source: NLM, HSDB

○ Respiratory sensitization PRODUCT : Not classified

- Esfenvalerate : No data available

- Trade secret substances1 : No data available

- Trade secret substances2 : No data available

- Trade secret substances3 : No data available

- Glycerol : No data available

- Water : No data available

- Trade secret substances4 : No data available

○ Skin sensitization PRODUCT : Category 1

- Esfenvalerate : It may cause long-term or repeated skin contact hypersensitivity, Source: ICSC

- Trade secret substances1 : No data available

- Trade secret substances2 : No data available

- Trade secret substances3 : Unresponsiveness, Source: IUCLID

- Glycerol : No data available

- Water : No data available

- Trade secret substances4 : Skin sensitization test using guinea pig (analogy to OECD TG 406) the result is shown as a non-sensitizer, Source: ECHA

○ Carcinogenicity PRODUCT : Category 2

- Esfenvalerate : No data available

- Trade secret substances1 : No data available

- Trade secret substances2 : No data available

- Trade secret substances3 : No data available

- Glycerol : No data available

- Water : No data available

- Trade secret substances4 : No data available

○ Germ cell mutagenicity PRODUCT : Category 2

- Esfenvalerate : No presence and effect of genotoxic irrespective of DNA synthesis test, metabolic activation system in the liver of male rats in vitro microbial reverse mutation test and in vivo test results (Rat Liver), no toxic effects of the dielectric, Source: HSDB

- Trade secret substances1 : No data available

- Trade secret substances2 : No data available

- Trade secret substances3 : In vitro / audio, Source: IUCLID

- Glycerol : in vitro - reverse mutation test using bacteria: Negative (S. typhimurium TA1535, TA1537, TA98, TA100, irrespective of metabolic activation system), Source: ECHA

- Water : No data available

- Trade secret substances4 : Dominant lethal Using an in vivo mouse (male and female) test results, voice (according to the method of Bateman AJ and Bateman AJ and Epstein SS) micronucleus test results using the in vivo mammalian erythrocyte, voice (OECD TG 474, GLP) in vivo mammalian unscheduled DNA synthesis using the liver cells (UDS) test, negative (OECD TG 486, GLP), Source: ECHA

○ Reproductive toxicity PRODUCT : Not classified

- Esfenvalerate : Targeting the rat developmental / reproductive toxicity test results, little size and survival rates decrease, the sons of parameters, fertility indices, bond indices, reproductive organs are not affected targets rats reproductive / developmental toxicity tests, body weight, food from the mother and cub consumption has decreased indexes found a low birth rate, but there were no adverse effects on the reproductive parameters. NOAEL = 100 ppm using the rat oral developmental toxicity test results, the maternal weight and food consumption decreased, fetal skeletal deformities are not affected NOAEL = 20mg / kg, Source: HSDB

- Trade secret substances1 : No data available

- Trade secret substances2 : No data available

- Trade secret substances3 : Normal rats, Source: IUCLID

- Glycerol : Exposure time results in an oral gavage to male and female rats over a period of glycerin in the second generation of growth with the second generation, reproduction and reproductive function has no negative impacts. It did not affect the offspring developmental toxicity in female rats treated with glycerin, rat, Source: ECHA

- Water : No data available

- Trade secret substances4 : Rats second-generation reproductive toxicity test results using (male and female), their parents are not systemic toxicity, reproductive toxicity has been found, but found. NOAEL (three children 1,2) = 200 mg / kg bw / day, NOAEL (parents) = 70 mg / kg bw / day (SOP of the International Research and Development Corporation, GLP) developmental toxicity test results in the high-dose group reduction of food intake and weight gain during pregnancy, fetal weight loss, cardiovascular instrument type or the sternum and malformation of the spine, skeletal deformity. NOEAL (maternal toxicity) = 40 mg / kg bw / day, NOEAL (recordable) = 40 mg / kg bw / day, (EPA OPP 83-3, GLP), Source: ECHA

○ Specific target organ toxicity single exposure PRODUCT : Not classified

- Esfenvalerate : Substances that can affect the central nervous system, with acute toxic effects not apply to classification in this section, Source: IPCS

- Trade secret substances1 : Causes irritation if inhaled prayer

- Trade secret substances2 : No data available

- Trade secret substances3 : No data available

- Glycerol : Oral: death before muscle spasms and epileptic seizures, survivors and found to be normal within 2.5 hours after dosing. High cholesterol in / pyloric and small intestine; Pulmonary congestion; Pale Girard; In the three objects of noesumak show high cholesterol. Transdermal after about 12 hours in experimental animals (guinea pigs) are so familiar with the limitations of bandages haeteum feeding activities as usual. Experimental animal is applied a large amount of experimental material there was dying to break down the body temperature falls. The amount of test substance is equal jeokyongryang unaffected. Consequently, the amount applied to the test in this cotton pad Skin irritation is not observed. Of Inhalation (generated by using the test material is heated to 200 ℃ through the air) after 1 hour or 2 hour exposure to saturated vapor of acute toxicity was determined glycerin. Under experimental conditions, acute inhalation exposure of rats for two hours in a saturated steam generation at 200 ℃, while that generated the 100% mortality rate, the death rate was not observed for the first time exposure. The nominal concentration of 11.0 mg / L yimyeoyi Study is a condensation aerosol. Accordingly, 1 hour LC50 based on nominal concentration was> 11.0 mg / L. Divided into four hours, depending on the OECD GHS Directive from 1 hour to 4 hours LC50 can determine LC50. Therefore, the 4 hours LC50 value calculated based on the nominal concentration is> 2.75 mg / L. In addition, after exposure to 1100 mg / L was measured for L (Ct) 50. L (Ct) of glycerine 50 was 4655 mg min / L., Source: ECHA

- Water : No data available

- Trade secret substances4 : Rat oral toxicity test results using (male and female), stiffness, crouch, show an irregular respiration and ataxia, lethargy, ptosis symptoms, mortality, weight gain, gastric chweyang, liver, Xinjiang bleeding symptoms. (OECD TG 401, GLP) dermal toxicity test using rats (number), skin irritation, irritation of the president and the lungs. Visible symptoms of scab. = Severe dermatitis LD50, ulcers by about 1600 mg / kg bw (GLP) inhalation found, appears include edema, dyspnea, pulmonary hemorrhage, Source: ECHA

○ Specific target organ toxicity repeated exposure PRODUCT : Not classified

- Esfenvalerate : Chronic repeated targeting Mouse oral toxicity test results, salivation, irritability, fibrillation, tremors, convulsions, bent posture, gait instability, including lesions, hair loss, inflammation. The initial water consumption decreases rapidly, urine pH decreased. Histopathological changes in the liver, spleen, lymph nodes, thymus, skin and kidney, for up to 90 days to targeted discovered NOAEL = 50 ppm rat in disguise repeated oral toxicity tests, neurological disorders was found, body tremors, convulsions, abnormal the pedestrian It is observed. It decreased weight gain and food consumption. NOAEL = 150 ppm as a target for more three weeks repeated oral toxicity test results in a high concentration in the first week of weight loss, decreased food consumption, ataxia, increased adrenal weight NOEL = 100ppm, Source: HSDB

- Trade secret substances1 : No data available

- Trade secret substances2 : No data available

- Trade secret substances3 : Reduction of rat body weight, Source: IUCLID

- Glycerol : Orally (chronic) NOAEL = 8000 ~ 10,000 mg / kg bw, Rat transdermal (sub-chronic): After 8 hours / day, 5-day / week dermal exposure at a dose level of 4.0 ml / kg for 45 weeks via the rabbit , no significant effect, Rabbit inhalation (sub-chronic): NOAEL is represented by a 167 ㎎ / ㎥ on the basis of local irritation effects in the upper respiratory tract, Rat, Source: ECHA

- Water : No data available

- Trade secret substances4 : Rats repeated oral toxicity test results using (male and female), body weight and food consumption decreased lesion above a high dose, show symptoms of squamous metaplasia, the death of the salivary glands. NOAEL = 7 mg / kg bw / day rabbit dermal toxicity test repeated using the (male and female), severe skin irritation accompanied by redness and swelling, but no deaths and physical symptoms of toxicity .NOAEL = approximately 0.2% of the items in the acute toxic effects It does not apply in the classification, Source: ECHA

○ Aspiration hazard PRODUCT : Not classified

- Esfenvalerate : No data available

- Trade secret substances1 : No data available

- Trade secret substances2 : No data available

- Trade secret substances3 : No data available

- Glycerol : No data available

- Water : No data available

- Trade secret substances4 : No data available

12. ECOLOGICAL INFORMATION

1) Aquatic toxicity

● Fish>PRODUCT : Acute 1

- Esfenvalerate : LC50 0.00025 ㎎ / ℓ 96 hr Pimephales promelas, Source: HSDB
- Trade secret substances1 : LC50 116 ㎎ / ℓ 48 hr, Source: ECOTOX
- Trade secret substances2 : LC50 817.890 ㎎ / ℓ 96 hr, Source: ECOSAR
- Trade secret substances3 : LC50 0.027 ㎎ / ℓ 96 hr, Source: ECOSAR
- Glycerol : LC50 54000 ㎎ / ℓ 96 hr Oncorhynchus mykiss , (exponential manner, fresh water, GLP), Source: ECHA
- Water : No data available
- Trade secret substances4 : LC50 20 ㎎ / ℓ 96 hr Oncorhynchus mykiss (NOEC 21.5mg / L time 49day test species Oncorhynchus mykiss), Source: NCIS

● Crustacea>PRODUCT : Acute 1

- Esfenvalerate : LC50 0.000029 ㎎ / ℓ 96 hr Daphnia magna, Source: HSDB
- Trade secret substances1 : No data available
- Trade secret substances2 : LC50 13188.484 ㎎ / ℓ 48 hr, Source: ECOSAR
- Trade secret substances3 : LC50 0.000783 ㎎ / ℓ 48 hr, Source: ECOSAR

- Glycerol : LC50 1955 ㎎ / ℓ 48 hr Daphnia magna , (exponential manner, fresh water), Source: ECHA

- Water : No data available
- Trade secret substances4 : EC50 1.4 ㎎ / ℓ 48 hr Daphnia magna (NOEC 0.53mg / L (nominal) 0.27 mg / L (measured). 21day test species Daphnia magna), Source: ECHA

● Aquatic algae>PRODUCT : Acute 1

- Esfenvalerate : LC50 381 ㎎ / ℓ 14 day other (Colinus virginianus), Source: HSDB
- Trade secret substances1 : No data available
- Trade secret substances2 : EC50 62.072 ㎎ / ℓ 96 hr, Source: ECOSAR
- Trade secret substances3 : EC50 0.003 ㎎ / ℓ 96 hr, Source: ECOSAR
- Glycerol : EC3> 10000 ㎎ / ℓ 8 day Scenedesmus quadricauda , (exponential manner, fresh water), Source: ECHA
- Water : No data available
- Trade secret substances4 : ErC50 0.02 ㎎ / ℓ 72 hr Scenedesmus subspicatus, Source: NCIS

2) Persistence and degradation

● n-octanol water partition coefficient>PRODUCT : Chronic 2

- Esfenvalerate : 6.22 log Kow, Source: HSDB
- Trade secret substances1 : No data available
- Trade secret substances2 : No data available
- Trade secret substances3 : 7.45 log Kow, Source: ChemIDplus
- Glycerol : -1.75 log Kow , (log Pow, 25 ℃), Source: ECHA
- Water : No data available
- Trade secret substances4 : 0.18 log Kow (at 25 ° C), Source: ECHA

● Degradation>PRODUCT : Chronic 2

- Esfenvalerate : No data available
- Trade secret substances1 : No data available
- Trade secret substances2 : No data available
- Trade secret substances3 : No data available
- Glycerol : BOD5 / COD COD, TOC of 0 hour 0%, 0%, 2 hours, 14%, 18% and 32%, 4 hours, 38%, 24 hours: 92%, 93%, Source: ECHA
- Water : No data available
- Trade secret substances4 : No data available

● Biodegradation>PRODUCT : Chronic 2

- Esfenvalerate : No data available
- Trade secret substances1 : No data available
- Trade secret substances2 : No data available
- Trade secret substances3 : 91.9 (%) ~ 88.9 (%) 28 day, Source: OECD TG 301B, GLP, IUCLID
- Glycerol : 60 (%) 2 hr , (TOC removal), Source: ECHA
- Water : No data available
- Trade secret substances4 : 80% ~ 70% 28 day (OECD Guideline 301 B, GLP), Source: ECHA

3) Bioaccumulative potential>PRODUCT : Chronic 2

- Esfenvalerate : 12000 ((Estimated)), Source: HSDB
- Trade secret substances1 : No data available
- Trade secret substances2 : 3.162, Source: Ecological Structure Activity Relationships(ECOSAR)
- Trade secret substances3 : No data available
- Glycerol : 3 BCF, Source: HSDB
- Water : No data available
- Trade secret substances4 : 3.16 ((calculated using SRC BCFWIN v3.01)), Source: ECHA

4) Mobility in soil>PRODUCT : Chronic 2

- Esfenvalerate : 5248 Koc (predicted), Source: HSDB

- Trade secret substances1 : No data available
- Trade secret substances2 : No data available
- Trade secret substances3 : No data available
- Glycerol : No data available
- Water : No data available
- Trade secret substances4 : Blanket 1416 ~ 388.3 blanket, Source: ECHA

5) Other adverse effects>PRODUCT : Chronic 2

- Esfenvalerate : No data available
- Trade secret substances1 : No data available
- Trade secret substances2 : No data available
- Trade secret substances3 : No data available
- Glycerol : No data available
- Water : No data available
- Trade secret substances4 : No data available

13. DISPOSAL CONSIDERATIONS

1) Disposal methods

- Every commercial waste producer shall either treat wastes generated from his/her place of business by him/herself or commission the treatment of such wastes to a person who has license for a waste treatment business under Article 26(3), a person who recycles of such wastes under Article 44(2), a person who has installed and operates a waste disposal facility under Article 4 or 5, a person who has completed the registration of a business of discharging wastes into the sea under Article 18 of the Marine Environment Management Act.

2) Precautions (including disposal of contaminated container of package)

- Do not allow spill material to enter sewers, storn water drains, soil, etc.

14. TRANSPORT INFORMATION

1) UN No. : 3352

2) Proper shipping name : PYRETHROID PESTICIDE, LIQUID, TOXIC

3) Class or division : 6.1

4) Packing group : II

5) Marine pollutant : Yes

6) Special safety response for transportation or transportation measure :

Emergency measures in case of fire : F-A

Emergency measures in the effluent : S-A

- ADR

· Tunnel restriction code : D/E

- IMDG

· Marine pollutant : Yes

- Air transport(IATA)

· UN No. : 3352

· Proper shipping name : PYRETHROID PESTICIDE, LIQUID, TOXIC

· Class or division : 6.1

· Packing group : II

15. REGULATORY INFORMATION

• FIFRA Classification

This chemical is a pesticide product registered by the United States Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets (SDS), and for workplace labels of non-pesticide chemicals. The hazard information required on the pesticide label is reproduced below. The pesticide label also included other important information, including direction for use. Following is the hazard information as required on the pesticide label:

CAUTION
Harmful if Swallowed.
Cause moderate eye irritation.
Avoid contact with eyes, skin or clothing.
Wear protective eyewear.
Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco or using the toilet.
Remove and wash contaminated clothing before reuse.

● Global Inventory - USA. Toxic Substances Control Act (TSCA) Chemical Substances Inventory (12 April 2018)

- Trade secret substances1

- Trade secret substances2

- Trade secret substances3

- Glycerol

- Water

- Trade secret substances4

● ETC regulation - EPCRA (SARA Title III) Section 302 Extremely Hazardous Substance (EHS) (40 CFR 355, Appendix A)

Not applicable

● ETC regulation - OSHA Hazard Communication Standard: On One of the Floor Lists of the OSHA HCS (29 CFR 1910.1200)

- Glycerol

● ETC regulation - EPCRA (SARA Title III) Section 313 Toxic Chemical Release Inventory (TRI) Reporting for RY 2013 (as amended Sep. 30, 2014)

Not applicable

● ETC regulation - CERCLA Hazardous Substances [other than radionuclides] (40 CFR 302.4) (as amended by 75 FR 78918, Dec. 17, 2010)

Not applicable

● ETC regulation - RCRA Appendix VII: Hazardous Wastes (40 CFR 261, App. VII, Basis for Listing Hazardous Waste)

Not applicable

● ETC regulation - CERCLA. Radionuclides and their Reportable Quantities (40 CFR 302.4, App. B)

Not applicable

● ETC regulation - RCRA D List of Characteristic Hazardous Wastes (40 CFR 261.21-24)

Not applicable

● ETC regulation - RCRA F List of Hazardous Wastes from Non-Specific Sources (40 CFR 261.31(a)) (as amended by 73 FR 31756, June 4, 2008)

Not applicable

● ETC regulation - RCRA K List of Hazardous Wastes from Specific Sources (40 CFR 261.32)

Not applicable

● ETC regulation - RCRA P List of Hazardous Wastes (40 CFR 261.33(e) and 40 CFR 302 [CERCLA])

Not applicable

● ETC regulation - RCRA U List of Hazardous Wastes (40 CFR 261.33(f) and 40 CFR 302 [CERCLA], as amended 75 FR 78918, Dec 17, 2010

Not applicable

● ETC regulation - DOT Hazardous Materials Table Listings (49 CFR 172.101, as amended through October 31, 2013)

● ETC regulation - EPCRA (SARA Title III) Section 304 Extremely Hazardous Substances Reporting Quantities and the Comprehensive Environmental Respo

Not applicable

16. OTHER INFORMATION

1) Reference

- (TOMES;RTECS)
- ChemIDplus
- ECHA
- ECOSAR
- ECOTOX
- EPA
- Ecological Structure Activity Relationships(ECOSAR)
- HSDB
- HSDB, ChemIDplus
- IPCS, ICSC, JMPR, NITE
- IUCLID
- NCIS
- NLM, HSDB
- OECD TG 301B, GLP, IUCLID
- OSHA

2) Print date : 2022-09-06

3) Revision date

○ Revised date count : 0

○ Last revised date : 2022-09-06

○ Last revised history :

4) Other