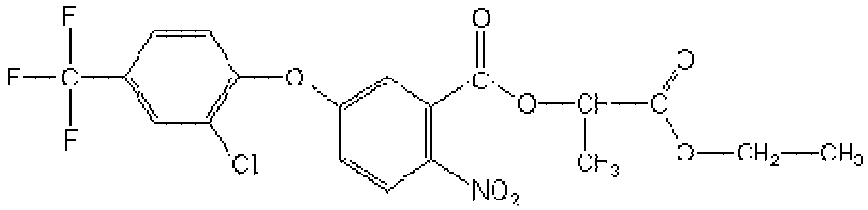
Hangzhou Tianlong Biotechnology Co., Ltd.
Add: Room 1906, Fengqi Times Tower, No.338, Fengqi East Road, Hangzhou, Zhejiang, China.

MATERIAL SAFETY DATA SHEET

1. Chemical Product and Company Identification

Product Name: Lactofen
Molecular Formula: $C_{19}H_{15}ClF_3NO_7$
Molecular Weight: 461.8
Structural Formula:



Chemical Name: 2-ethoxy-1-methyl-2-oxoethyl 5-[2-chloro-4-(trifluoromethyl)phenoxy]-2-nitrobenzoate
CAS No.: 77501-63-4
Supplier: HANZHOU TIANLONG BIOTECHNOLOGY CO., LTD
Address: Room 1906, Fengqi Times Tower, No.338 Fengqi East Road, Hangzhou, China, 310020
Tel: 0086-571-87214516
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2. Composition / Information on Ingredients

Composition	CAS No.	Content %
Lactofen	77501-63-4	80.0
Other ingredients		20.0

3. Hazards Identification

Danger: Corrosive to eyes. Causes irreversible eye damage. Harmful if swallowed or absorbed through the skin. Do not get in eyes, on skin or on clothing. May cause allergic skin reactions.

4. First Aid Measures

Eye Contact: Flush eyes immediately with fresh water for at least 15 minutes while holding the eyelids open. Remove contact lenses if worn. See a doctor for further treatment as soon as possible.
Skin Contact: Remove contaminated clothing. Wash skin thoroughly with

soap and water. See a doctor if any signs or symptoms described in this document occur. Discard contaminated non-waterproof shoes and boots. Wash contaminated clothing.

Ingestion: If swallowed: Do not induce vomiting. Call a physician or Poison Control Center. Drink promptly a large quantity of milk, egg whites, or gelatin solution. If these are not available, drink large q antities of water. Avoid alcohol. Get u medical attention immediately.

Inhalation: If respiratory discomfort or irritation occurs, move the person to fresh air. See a doctor if discomfort or irritation continues.

Notes to physician: If ingested, probable mucosal damage may contraindicate the use of gastric lavage. This material contains a light hydrocarbon liquid; ingestion or subsequent vomiting can result in aspiration of this product, which can cause pneumonitis.

5. Fire-Fighting Measures

Flash Point: 127℉(53℃)

Method: Setaflash Closed Cup

Autoignition: NDA

Extinguishing Media: CO_2, alcohol-type foam, dry chemical, water fog.

6. Accidental Release Measures

For spills on land:

Containment: Avoid runoff into storm sewers and ditches which lead to waterways. Contain spilled liquids with dry sorbents.

Cleanup: Clean up spill immediately. Absorb spill with inert material (such as dry sand or earth), then place in a chemical waste container. Wash area with soap and water. Pick up wash liquid with additional absorbent and place in a disposable container.

For spills in water:

Containment: This material forms an emulsion in water. Stop or reduce contamination of any water. Isolate conaminated water.

Cleanup: Remove contaminated water for removal or treatmentt.

7. Handling And Storage

End user must read and observe all precaution on product label. Do not use or store near flame, sparks, or hot surfaces. Use only in well-ventilated area. Keep container closed. Keep pesticide in original container. Do not store or transport near food or feed. Do not put concentrate in food or drink containers. Do not dilute concentrate in food or drink containers. Store in a secure, preferably locked, cool dry storage area away from heat, open flame, and direct sunlight.

8. Exposure Controls/Personal Protection

End user must read and observe all precaution on product label.

Eye protection:
Do not get this material in your eyes. Appropriate eye protection must be worn when working with this material. Wear protective eyewear at all times.
respiration/ventilation: This material may be a respiratory irritant and, unless ventilation is adequate, the use of approved respiratory protection is recommended.
Skin protection: Do not get on skin or clothing. Skin contact should be avoided by wearing protective clothing including chemical resistant gloves, long sleeved shirt, long pants, shoes, and socks. Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them.

9. Physical and Chemical Properties

Appearance: Dark gray to brown oil liquid
Water Solubility: 0.1 mg/L @ 20 ℃
Solubility in Other Solvents: isopropanol s., acetone s., xylene s.
Melting Point: 43.9 - 45.5 ℃
Vapor Pressure: 1.1 x 10 to the minus 3 mPa @ 25 ℃
Partition Coefficient: 100,000
Adsorption Coefficient: Koc = 10,000

10. Stability and Reactivity

Chemical Stability: Stable.
Oxidation/Reduction Properties: Not reactive.

11. Toxicological Information

ACUTE:
Eye Irritation: This product is produced moderate to severe eye irritation and irreversible corneal damage in rabbits. (Toxicity Category I, Corrosive)
Skin Irritation: This product produced moderate skin irritation (72 hour PPI = 2.1) in rabbits. (Toxicity Category III)
Dermal Toxicity: The dermal LD50 in rabbits is greater than 2 g/kg. (Toxicity Category III)
Oral Toxicity: The oral LD50 in rats is 1.289 g/kg. (Toxicity Category III)
Inhalation Toxicity: The 4-hour inhalation LC50 is greater than 3.6 mg/l. (Toxicity Category IV)
Skin Sensitization: This product produced a positive response in a modified Buehler Guinea Pig Sensitization Test.

Reproductive Effects: Reduced mean pup weight as well as increased pup heart and liver weights were observed in rats at dietary doses of 25 mg/kg/day over a two-generational study. In another study of rats, possibly of shorter duration, no effects were observed at 50 mg/kg/day, but increased post-implantation loss and reduced pup body weight were observed at a higher dose of 150 mg/kg/day in the same study. Reduced maternal food

consumption was observed at dietary doses of 20 mg/kg/day in a study on rabbits of unspecified duration. It is unlikely that lactofen would cause reproductive effects in humans under normal conditions.

Teratogenic Effects: Fetal bent ribs were observed at doses of 150 mg/kg/day in the second rat study referenced above. No fetotoxic or teratogenic effects were observed at dietary doses of 20 mg/kg/day and higher in a study on rabbits of unspecified duration. It is unlikely that lactofen would have teratogenic effects in humans under normal conditions.

Mutagenic Effects: Results of the Ames mutagenicity assay for lactofen were inconclusive in two trials; one trial was positive for mutagenicity and one was negative. Tests of lactofen's capacity to induce chromosomal aberrations, unscheduled DNA synthesis and inhibit DNA repair were all negative . Lactofen shows little if any mutagenic or genotoxic activity.

Carcinogenic Effects: An increase in the combined incidence of liver adenoma and carcinoma was observed in mice at dietary doses of 37.5 mg/kg/day over an 18-month period. Increases in liver neoplastic nodules and foci of cellular alteration (possible precursors to tumors) were noted in rats at dietary doses of 50 mg/kg/day over two years. This evidence indicates that at very high doses, lactofen may show some carcinogenic activity. It is classified by EPA as a B2 (probable) human carcinogen .

Organ Toxicity: Based on the reported results of animal tests cited above, organ systems potentially affected by exposure to lactofen include the liver and kidneys.

12. Ecological Information

Effects on Birds: Lactofen is practically non-toxic to studied bird species . The reported oral LD50 value is greater than 2,510 mg/kg for the bobwhite quail. Reported eight-day dietary LC50s for technical lactofen are >5,620 ppm in the mallard and duck. The formulated product (Cobra), having a lesser proportion of active ingredient, is probably less toxic to birds.

Effects on Aquatic Organisms: Lactofen's toxicity to fish and other aquatic organisms varies greatly; the formulated product is probably more toxic than the technical product. Reported 96-hour LC50s for the technical product are higher than the reported water solubility, which indicates that toxic effects to fish and other aquatic species may be unlikely due to its very low water solubility. Reported 96-hour LC50s for the formulated product (Cobra), however, are 0.49 mg/L and greater than 0.85 mg/L for bluegill sunfish and rainbow trout respectively, indicating high toxicity. This high toxicity may be in large part due to the increased water solubility and bioavailability of the

compound in the emulsified form. Reported 48-hour LC50s for Daphnia, an aquatic invertebrate species important as a food source for many aquatic species and indicator species, are 2 mg/L for the technical product and 5.1 mg/L for Cobra, indicating high toxicity for both forms. Due to its low water solubility (hence high lipid solubility) lactofen may have the potential to bioconcentrate. The reported whole body fish bioconcentration factor (concentration in the fish on a whole-body basis versus the environmental concentration) is 380X after 30 days exposure. Elimination of the compound by the fish (depuration) was almost complete within 14 days, and 58% was eliminated within the first day.

Effects on Other Animals (Nontarget species): An LD50 of greater than 160 ug/bee is reported for the technical compound in honeybees , indicating low toxicity for this species. No data were available regarding the toxicity of lactofen to earthworms or other non- target species.

13. Disposal Considerations

Disposal methods: Check governmental regulations and local authorities for approved disposal of this material. Dispose in accordance with applicable laws and regulations.

14. Transport Information

Class: 9
UN NO.: 3082
Packing group: III

15. Regulatory Information

Keep locked up out of reach of children and other, unauthorized persons. Keep away from food, drink and animal feeding stuffs.

Users should wash hands before eating, drinking, chewing gum, using tobacco or using the toilet. Do not get in eyes, on skin or on clothing. Do not breathe dust, vapor or spray mist.

In case of accident of if you feel unwell, seek medical advice immediately.

This material and its container must be disposed of in a safe way.

Do not contaminate any body of water.

16. Other Information

All information and instructions provided in this Material Safety Data Sheet (MSDS) are based on the current state of scientific and technical knowledge at the date indicated on the present MSDS and are presented in good faith and believed to be correct. This information applies to the product as such. In case of new formulations or mixes, it is necessary to ascertain that a new danger will not appear. It is the responsibility of persons on receipt of this MSDS to ensure that the information contained herein is properly read and understood by all people who may use, handle, dispose or in any way come in contact with the product. If the recipient subsequently produce formulations containing this product, it is the recipients sole responsibility to

ensure the transfer of all relevant information from this MSDS to their own MSDS.