Lambda-cyhalothrin -MATERIAL SAFETY DATA SHEET

Manufacturer/information service:

ZHEJIANG RAYFULL CHEMICALS CO.,LTD
ADD: NO.113 PUXING ROAD, PUZHOU INDUSTRIAL PARK, LONGWAN DISTRICT, WENZHOU ZHEJIANG P.R. CHINA
Tel: +86-577-88905587 Fax: +86-577-88905567
Email: info@rayfull.com sales@rayfull.com

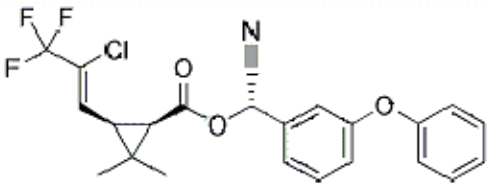
1. Chemical Product Identification

   Product Name: Lambda-cyhalothrin 95%TC

   Molecular Formula: $C_{23}H_{19}ClF_3NO_3$

   Molecular Weight: 449.90

   Structural Formula:



   Chemical Name:(R)-cyano(3-phenoxyphenyl)methyl(1S,3S) chloro-3,3,3-trifluoro-1-propenyl]-2,2-dimethylcyclopropanecarboxylate

   Form: Solid powder

   Color: White or light yellow

   Odor: Slight odor/typical aromatic solvent

   CAS No.: 91465-08-6

2. Composition / Information On Ingredients

Composition	CAS No.	Content %
Lambda-cyhalothrin	91465-08-6	95.0
Other ingredients		5.0

3. Hazards Identification

   Symptoms of acute exposure: May cause mild eye and skin irritation. Toxic if swallowed or absorbed through the skin. Exposure to high vapor vapor levels may cause headache,

dizziness, numbness, nausea, incoordination, or other central nervous system effects. May cause temporary itching, tingling, lurning or numbness of exposed skin, called paresthesia.

Hazardous decomposition products: can decompose at high temperatures forming toxic gases.

4. First Aid Measures

In case of poisoning by any exposure route contact a doctor or Poisons Information Center.

Eye: If product gets in eyes wash it out immediately with copious quantities of water for 15 minutes. Seek medical advice.

Skin: If skin contact occurs remove contaminated clothing and wash affected areas thoroughly with soap and water. Wash contaminated clothing before re-use. The active ingredient may be absorbed through the skin with resultant toxic effects. Seek immediate medical advice.

Inhaled: Move person to fresh air and keep at rest until recovered. Remove any contamined clothing and loosen remaining clothing. Allow patient to assume most comfortable position and keep warm. If breathing labored and patient cyanotic (blue) ensure airways are clear and have qualified person give oxygen through a face mask. If breathing has stopped, apply artificial respiration at once. In event of cardiac arrest, apply external cardiac massage. Seek medical attention.

Swallowed: Rinse mouth with water and give water to drink. Do not induce vomiting. Seek immediate medical assistance.

Advice to doctor: No specific antidote exists. Treat symptomatically

5. Fire-Fighting Measures

Unusual Fire, Explosion and Reactivity Hazards: During a fire, irritating and possibly toxic gases may be generated by thermal decomposition or combustion.

In Case of Fire: Use dry chemical, foam or CO_2 extinguishing media. Wear full protective clothing and self-contained breathing apparatus. Evacuate nonessential personnel from the area to prevent human exposure to fire, smoke, fumes or products of combustion. Prevent use of contaminated buildings, area, and equipment until decontaminated. Water runoff can cause environmental damage. If water is used to fight fire, dike and collect runoff.

6. Accidental Release Measures

In Case of Spill or Leak: Control the spill at its source. Contain the spill to prevent it from spreading, contaminating soil, or entering sewage and drainage systems or any body of water. Clean up spills immediately, observing precautions outlined in Section 8. If a solid, sweep up material and place in a compatible disposal container. If a liquid, cover entire

spill with absorbing material and place into compatible disposal container. Scrub area with hard water detergent (e.g. commercial products such as Tide, Joy, Spic and Span). Pick up wash liquid with additional absorbent and place into compatible disposal container. Once all material is cleaned up and placed in a disposal container, seal container and arrange for disposition.

7. Handling And Storage

   Store in cool, clean, ventilated, fireproof storage area. Keep away from heat, spark, open flame and incompatible materials. (Strong oxidizing agents). Protect containers against physical damage.

8. Exposure Controls/Personal Protection

   Ventilation: No special ventilation requirements are normally necessary for this product. However make sure that the work environment remains clean and that dusts and vapours are minimised.

   Eye Protection: Eye protection such as protective glasses or goggles is recommended when product is being used.

   Skin Protection: Prevent skin contact by wearing impervious gloves, clothes and, preferably, apron. Make sure that all skin areas are covered. See below for suitable material types.

   Protective Material Types: We suggest that protective clothing be made from rubber, PVC.

   Respirator: Usually, no respirator is necessary when using this product.

   Safety deluge showers should be provided near to where this product is being used.

9. Physical and Chemical Properties

   Appearance: White or light yellow solid powder

   Melting Point: 49.2 ℃

   Boiling Point: 187-190℃

   Density: 1.33g/cm^3 at 25°C

   Solubility: 0.005 mg/L at 20℃ in the water

   Solubility in Other Solvents: acetone, methanol, toluene, hexane.

   Vapor Pressure:2.67×10^{-10} Pa at 20℃

10. Stability and Reactivity

    Stability: Stable under standard conditions.

    Hazardous Polymerization: Will not occur.

Conditions to Avoid: None known.

11. Toxicological Information

Acute oral LD_{50} for male rats 79, female rats 56, mice 20 mg/kg.

Acute dermal LD_{50} for rats 632-696 mg/kg

Inhalation LC_{50} (4 h) 0.06 mg/l air (total particulate)

Moderate eye irritant (rabbits).

Not skin irritant (rabbits).

Non-sensitizer (guinea pigs)

Reproductive Effects: In two studies, lambda cyhalothrin caused reduced body weight gain at doses of 15 mg/kg/day in pregnant rats (highest dose tested) and at doses of 30 mg/kg/day in pregnant rabbits (also the highest dose tested), but these doses produced no observable reproductive effects. There were reduced numbers of viable offspring at doses of 50 mg/kg/day in the second and third generations in the three-generational rat study noted above. It is unlikely that lambda cyhalothrin would cause reproductive effects in humans under normal conditions.

Teratogenic Effects: No teratogenic or fetotoxic effects were observed in teratology studies of lambda cyhalothrin in rats and rabbits at the highest doses tested in both species (15 mg/kg/day and 30 mg/kg/day, respectively;. Based on these data, it is unlikely that lambda cyhalothrin causes teratogenic effects.

Mutagenic Effects: Lambda cyhalothrin produced negative results in all Ames mutagenicity assays using five different test strains, both with and without metabolic activation. Results of other in-vitro cytogenetic assays and chromosomal structural aberration tests indicated no mutagenic or genotoxic effects were caused by lambda cyhalothrin. The available evidence suggests that lambda cyhalothrin is non-mutagenic and non-genotoxic.

Carcinogenic Effects: No carcinogenic effects have been noted in studies of lambda cyhalothrin on various test animals (rats, rabbits, dogs). The evidence regarding the carcinogenicity of lambda cyhalothrin is inconclusive, but suggests that it is probably not carcinogenic.

Organ Toxicity: No specific target organs or organ systems have been identified in the available studies of chronic toxicity. The nervous system may be affected after acute exposure.

12. Ecological and Ecotoxicological Information

Effects on Birds: Lambda cyhalothrin's toxicity to birds ranges from slightly toxic to practically non-toxic. In the mallard duck, the reported oral LD_{50} is greater than 3,950 mg/kg, and the reported dietary LC_{50} is 3,948 ppm. In bobwhite quail the reported dietary LC_{50} is greater than 500 ppm. There is evidence that it does not accumulate in the eggs or tissues of birds.

Effects on Aquatic Organisms: Lambda cyhalothrin is very highly toxic to many fish and aquatic invertebrate species. Reported LC_{50}s in these species are as follows: bluegill sunfish, 0.21 ug/L; rainbow trout, 0.24 ug/L; Daphnia magna, 0.36 ug/L; mysid shrimp, 4.9 ng/L; sheepshead minnow, 0.807 ng/L. A median effect concentration, EC_{50} (i.e. the concentration at which the effect occurs in 50% of the test population), for the eastern oyster of 0.59 ng/L has been reported. Bioconcentration is possible in aquatic species, but bioaccumulation is not likely. Bioconcentration in channel catfish has been reported as minimal, with rapid depuration (elimination). A bioconcentration factor of 858 has been reported in fish, species unspecified), but concentration was confined to non-edible tissues and rapid depuration was observed.

Effects on Other Animals (Nontarget species): Lambda cyhalothrin is highly toxic to bees, with a reported oral LD_{50} of 38 ng/bee and reported contact LD_{50} of 909 ng/bee (0.9ug/bee).

13. Disposal Considerations

Waste: Pesticide wastes are toxic and hazardous. Dispose of in accordance with applicable and local laws and regulations. Do not discharge or pour into soil, drainage system or bodies of water.

Container: Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or incineration, or if allowed by state and local authorities, by burning (plastic containers). If burned, stay out of smoke.

14. Transport Information

Not applicable.

15. Regulatory Information

Not applicable.

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.